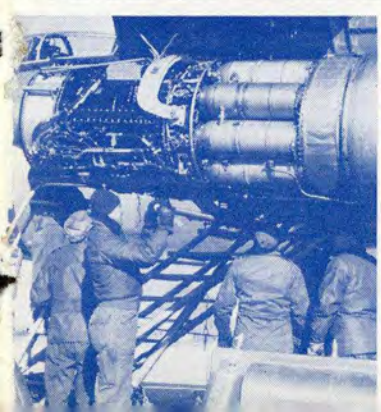
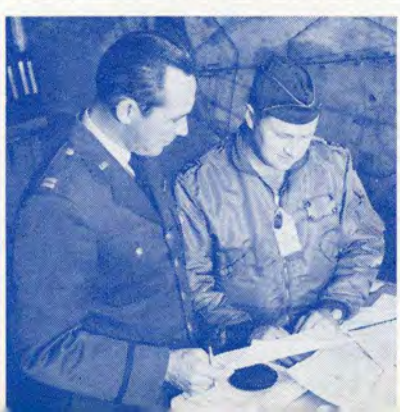
JUNE 1959

FLYING SAFETY

UNITED STATES AIR FORCE





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VOLUME FIFTEEN • NUMBER SIX • USAF PERIODICAL 62-1

"I understand some of our relatives are trying to fly around in those things."

CONTENTS

THE CHECKLIST

✔ Timely Operational Hazard Reports (OHR) continue to pay dividends. From the 11th Bomb Wing at Altus AFB came a report on a deficiency in the KC-135 navigation system. With OMNI and TACAN both on and the switch on OMNI, a serious hazard results if power to the OMNI fails. The selector switch for the KC-135 receives power from the VHF navigation power system. If power to this circuit fails, TACAN will be automatically selected. The indicators previously showing course and direction to the selected OMNI station will then indicate course and direction of the operating TACAN station last selected. Other aircraft are involved also. Until corrective action is completed, take care. . . .

✔ It is urged that "Well Done" nominations be prepared in time to arrive at this office within 60 days of the incident occurrence. Recognition, to be valuable, should be timely. . . .

✔ Quoted here is part of a message from the Commander of Air Weather Service to all subordinate wings and groups: "In addition to springtime thunderstorm and icing problems, unfavorable wind conditions demand special attention. Surface wind phenomena contribute to more weather factor accidents and incidents than any other at this time of the year. Suggest detachment seminars include a discussion of gusty winds, terrain effects, turbulence in the approach and departure zones, and windshear of direction and velocity associated with low-level inversions. The effect of a low-level velocity jet or direction shear is extremely important to large, heavily laden aircraft."

✔ Hypoxia is still a killer. Two more accidents directly traced to this cause in the past few months.

✔ F-100 drivers will find much to be learned and used in the accident prevention pamphlet entitled "Notes on F-100 Gunnery" issued by DFSR in January. The pamphlet bears Project No. 3-59. Try it for size. Comments welcome.

✔ A Safety of Flight Supplement on altimeters will soon be issued for all Air Force aircraft alerting aircrews to the fact that turning the Kollsman number indicator approximately 53 times will make the altimeter read plus or minus 10,000 feet. In preflighting, double-check the 10,000-foot pointer to make sure it is on ZERO, and not on NINE to the left or ONE to the right. Also, make sure the cross-hatched window is fully open, extending from figures SIX to FOUR.

"What's Your Analysis?"

There is nothing in the world that warms the cockles of an editor's heart like response from his readers. Believe it or not, this is true, regardless of whether the response is complimentary or otherwise.

In December 1958, we published an article entitled "What's Your Analysis?" and asked for your analysis of the accident discussed. Your response was gratifying, and we believe that the article has served its intended purpose—to make pilots think and thereby realize that unexpected things can and do happen in the course of a flight. In fact, we might say "off the cuff" that the only safe plan today is to expect the unexpected.

Space will not permit us to answer each one of you who wrote in individually or to rehash the flight and its consequences. Suffice to say that if just one pilot "reads and heeds" and by so doing, keeps himself from getting behind the same 8-Ball, all of our combined efforts will not have been in vain.

Thanks again for your cooperation and for your letters.

The Editors

★ ★ ★

From the Army

This is a safety of flight information message to various Army field stations. The article "You Are the Doctor" in the March 1959 issue of FLYING SAFETY Magazine is considered excellent material for use at flying safety meetings.

Director, U.S. Army Board for Aviation Accident Research Ft. Rucker, Alabama

We agree. Thanks again, Dr. Staton.

★ ★ ★

A Booster for . . .

. . . just for the record, if the controversy is still on, I enjoy your magazine in its present format and style. Let the boosters for an Atlantic Monthly type go hang.

Capt. Walter R. Miller, Commander, 118th TAC Ftr Sq Conn. ANG., Bradley Fld, Conn.

★ ★ ★

Hail, Hail . . .

In your story, "When the Sky Threw Rocks," (February 1959) you state, "The hail was not picked up on the scope prior to the incident because it just wasn't there." I doubt this statement. I believe that it was there, and had the APN-59 radar been equipped with an iso-echo contour attachment and manned by an operator experienced in its interpretation, the incident could have been avoided.

As Electronics Officer in Naval Air Transport Squadron Six, Atlantic Div., MATS, I was instrumental in the development of an iso-echo contour attachment for the APS-42 radar. Both the Bendix-Pacific Division and the Navy have documents on hand that indicate hail might have been expected in the passage areas between the cloud formations shown in your scope diagram, provided an ISO look indicated squeezed storm cores.

Perhaps another look at the ISO system is in order. It is my guess that you could procure 50 such radar attachments for the repair cost of that unfortunate C-133A, to say nothing of the cost of its down-time during repairs.

LCDR H. J. Weixler, Naval Air Development Center Johnsville, Pennsylvania

★ ★ ★

. . . The Gang's All Here!

We should like your permission to reprint extracts from the article, "When the Sky Threw Rocks," (February 1959) for distribution to our pilot briefers and forecasting personnel.

We believe that the article will be helpful in emphasizing the danger of flying close to severe echoes from thunderstorms.

A. K. Showalter, Chief Observations & Station Facilities Div U. S. Weather Bureau

Permission granted and we're glad to help.

CROSSFEED

LETTERS TO THE EDITOR

Pride . . .

Why must the maintenance men, crew chiefs, when pictured in "Mal Function" be described as slobs? I refer to the February 1959 issue of FLYING SAFETY.

Perhaps the artist/author would do well to visit a flightline. Thanks for the compliment!

A proud maintenance technician.

Our illustrator is a 15-year man shooting for 30, with many a trip to the flightline behind him. He says he'd never cast discredit on a fellow airman, but that for illustrative purposes a little ribbing helps drive a point home. Would you say that Mal is spared the lash of our artist's soggy brush?

Incidentally, we do compliment you. Your letter is signed with a declaration of pride that any commander would be pleased with.

The Woman's Angle

As an Air Force wife, I am naturally concerned with my husband's safety. Unlike thousands of other women, I can be very certain that my husband could live practically forever in rugged uncivilized country. He preaches safety. He practices what he preaches.

We were both horrified beyond description after reading "Horror in Hell's Canyon." I got out the red pencil and began underlining errors in judgment. I offered to ghost a survival article for my husband, who is OCIC of Implementation of Search and Rescue for Colorado, at the Lowry Air Force Base. He suggested the woman's angle—the wife who wants-the-old-man-to-come-home approach—might be better. He offered technical advice and briefed me more thoroughly on the Air Force role in Search and Rescue. My manuscript is enclosed for your consideration.

Lest you think I picked my material out of thin air, I submit the following combined qualifications:

Jane Ganter Swanson (Mrs. S. O.): National Ski Patrolwoman #100. Graduate of a qualified avalanche training program conducted by the U. S. Forest Service and the National Ski Patrol System, Card #95. Incidentally, I was one of the first women in the United States to be allowed to take this course.

1st Lt. Stanley O. Swanson: Went on his first rescue mission while still in Jr. High School, when the crew of an aircraft bailed out near Mt. Rainier. National Ski Patrolman #1327. (They have separate numbering systems for men and women.) Graduate and instructor in the Forest Service Ski Patrol Avalanche Training Program, Card #34. Member of the Mountain Rescue Council (active until entrance into the U. S. Air Force), based at Seattle, Washington.

Jane Ganter Swanson (Mrs. S. O.) 706 Uvalda Street Aurora, Colorado

We liked Mrs. Swanson's contribution and believe you will too. It begins on page 26.

★ ★ ★

Flight Preparation

Since "Flight Preparation" is the theme for this month, I am sending you a copy of a supervisor-operator tool which is used by us in that important phase of flight preparation: landing and takeoff. Your Flight Safety Survey Team visited here recently and recommended that this be forwarded for possible use in the magazine.

This tool is the takeoff and landing data card with an AF Form 113. The card itself is self-explanatory and must be filled out prior to each local or cross-country flight in the F-84F or T-33, as required by 108TFGp SOP 61-11, dtd 1 Apr 58. It is then reviewed by the clearance officer prior to flight approval.

I'll admit the introduction of its use by this unit over a year ago didn't come easy. Persistence paid off and now it is widely accepted and even appreciated. To facilitate completion of the card, we have placed the necessary flight planning charts in logical sequence in a looseleaf binder with each page in a flexible plastic holder. The average pilot can compute this information in 60 to 90 seconds.

This project has been a great help to the clearance officer, the supervisor and to me. We can be relatively assured that the pilot—be he a Second Lieutenant, a Colonel or a General—knows his takeoff roll, facts for an immediate landing after initial takeoff, and normal landing data with and without the drag chute.

Lt. Col. Francis R. Gerard Commander, 108th TAC FTR GP New Jersey ANG, McGuire AFB.

On the following pages are listed the twenty-four units which were the flying safety leaders of the United States Air Force for the last half of calendar year 1958.

The Selection Committee wishes to congratulate all those organizations which were nominated, and FLYING SAFETY magazine salutes the winners!

FLIGHT SAFETY AWARDS

★

4750th Air Defense Wg, Vincent AFB, Ariz. ADC

This Wing trains ADC's fighter-interceptor squadrons in weapons firing proficiency. During the award period, they flew 9700 hours and made 31,765 takeoffs and landings without accident or violation (joint-use field). Despite blazing summer and early fall temperatures of 110-120 degrees, operations proceeded without let-up. The Wing credits maintenance for a splendid job under these conditions.

★ ★ ★

32nd Air Div., (SAGE), Dobbins AFB Ga. ADC

To fly 12,636 accident-free hours in a six-months period is an enviable achievement. When this total is made up largely of time spent in air defense scrambles made under all weather conditions at any hour of the day or night, it is doubly commendable. One squadron, during this time, was handicapped by operating away from its home base because of extensive airfield construction. Fine work by all hands.

★ ★ ★

AFSW Center, Kirtland AFB, New Mex. ARDC

Their mission, development and testing of atomic weapons and support of the Atomic Energy Commission's continental and overseas tests, has a high built-in accident potential. Yet, by diligent application of flying safety principles, they flew 15,628 accident-free hours, and this in 17 different types and models of aircraft! Hats off to a two-time winner (2d half 1957). Can you do it again?

1100th Air Base Wg, Bolling AFB, Wash., D. C. HQC

During the award period the Wing flew 39,972 hours without a major accident. Wing flights ranged all over the globe, from the Arctic through Europe, the Middle and Far East, Latin America and all sections of the United States. Bad weather and limited maintenance facilities were taken in stride. In addition, almost 1400 rated personnel from the Washington area get their combat readiness training from this unit.

★ ★ ★

3301st Pilot Tng Gp, Moore Air Base, Tex. ATC

When in a six-months period, 261 student pilots can be graduated, 40,136 hours flown, and 71,141 landings made with only two minor accidents (no injuries), everyone on the base must be giving a lot of brainstrain to the problems of accident prevention. Single-engine, low time student pilots often bend birds badly—so this record is outstanding. Keep 'em flying safely, 3301st.

★ ★ ★

3615th Pilot Tng Wg (Basic), Craig AFB, Ala. ATC

The accident rate for '58 was kayoed by this outfit—this is their second plaque in one year. A zero rate for the current award period, while flying 33,383 student training hours, makes them front-runners in any league. Their three-fold mission—training basic instructors, jet qualifying recip pilots, giving basic single engine training—was accomplished with a 1.48 rate for the whole year. A great job!

3625th Tech Tng Gp, Tyndall AFB, Fla. ATC

This outfit provides live intercepts, often under adverse weather conditions, for the USAF Weapons Controller School at Tyndall. Two-thirds of the duty pilots are relatively inexperienced, being assigned directly from pilot training. Despite weather and inexperience, they flew 17,770 sorties in 41,895 hours over a 16-month period, without a single accident! Maintenance and support crews handled 70 sorties a day to accomplish this phenomenal record. They deserve a special salute.

★ ★ ★

9th Air Weather Gp, Scott AFB, Ill. MATS

Two weather recon squadrons compiled this Group's splendid record. The 55th, operating over the Arctic and Eastern Pacific Ocean, flew 33,000 hours in three years of accident-free weather patrols. The 59th flew for four years, piling up 27,500 hours, with one mishap—damaged blades on a propeller. Forty-nine hurricane recon flights, plus routine weather commitments, spiced their Bermuda tour.

★ ★ ★

62nd Troop Carrier Gp (H), Larson AFB, Wash. MATS

This outfit roams the globe in its giant Globemasters. It's sunny Cape Canaveral today, a paradrop at Ice Island Alpha near the North Pole tomorrow. They're proudest, though, of their year-round support of the radar outposts in Alaska. This entails movement of heavy construction equipment and outsize cargo to and from remote sites, using unimproved 4000-foot washboard landing strips. Yet, 31,228 hours flight time has been logged without accident, 14,487 of these in the last six months. A fine professional performance.

★ ★ ★

1611th Air Transport Gp, McGuire AFB, N. J. MATS

From July through December 1958, this group racked up the staggering total of 61,994 hours of flying without a single accident, incident or violation of flying regulations. Their aircraft carry patients, personnel and strategic materials in any amount wherever needed in the international military interest, as well as provide logistical support for such emergency operations as the Lebanon-Middle East and Formosa crises. To 1300 crewmembers and their 64 aircraft—good work!

★ ★ ★

16th Fighter Interceptor Sq, PACAF

This crack unit flew more than 10,000 hours during three consecutive six-month periods beginning 1 July 1957 without an accident. Their mission: all-weather air defense of an important area. When suddenly deployed over water to a distant base to meet an emergency, they overcame the obstacles of paralyzing weather, strange letdowns over unknown mountainous terrain, typhoons and a language barrier with their controllers. Here's a hearty 'well done' to maintenance, operations and flight crews.

40th Fighter Interceptor Sq, PACAF

The 40th is another two-time winner, their previous award being for the July-December 1957 period. Not a single accident mars their excellent record for 1958, achieved by flying 9,285 hours and accomplishing almost 8,000 sorties in all kinds of weather. Operating from their overseas location where language difficulties and lack of navigation aids are formidable problems, their frequent saves of distressed aircraft earn them congratulations all around.

★ ★ ★

802d Air Division, Schilling AFB, Salina, Kan. SAC

This topflight organization richly deserves its second Flight Safety Award. They managed a zero accident rate while accruing 27,152 flying hours, chiefly in B-47 and KC-97 aircraft. The Flying Safety philosophy is a way of life with these troopers, implemented at all levels by a first-rate training and safety program, monitored by "Prudent Pete," their safety conscience. Standardization, they say, is a key technique.

★ ★ ★

68th Bomb Wg (M), Chennault AFB, La. SAC

Three years and ten months of operation without an accident, while logging 80,147 B-47 hours, is the proud achievement of the 68th. They squeezed in 8,855 of these hours during the award period. In operational terms, this means 24 night mass refueling missions, 156 flights to England, and a SAC-directed no-notice simulated combat mission in which the unit won an effectiveness score of 98 per cent.

★ ★ ★

28th Bomb Wg (H), Ellsworth AFB, S. Dak. SAC

Training assigned units in long range bombardment techniques for operations on a global scale is a taxing assignment. To do the job safely requires more than rabbits' feet and luck. This B-52 wing, in flying 11,809 accident-free hours, relied on a carefully planned and supervised safety program and its crackajack maintenance organization. The combination paid off handsomely in the face of bad weather, the '52's winter icing problems, and months of extensive runway construction.

★ ★ ★

345th Bomb Wg, Tactical, Langley AFB, Va. TAC

Versatility is this outfit's middle name. In addition to bombing practice they flew 9,744 hours (total)—without accident—in accomplishing this miscellany: participation in Operations Swordfish, Boats and Tradewind; ferry duty from France to ZI; acting as seeing eye dogs for F-102s from Alaska to Alabama (for letdowns where no procedures existed for Deuces); deployments to Turkey—a haul of 5560 miles—and Okinawa, an 8600 mile jaunt.

20th Helicopter Sq, Sewart AFB, Tenn. TAC

Mission—perform air logistical and other special missions. This catchall phrase encompasses: 12,169 hours flying without a major accident since July 1955 (2772 hours during the award period); hydrographic operations at Frobisher Bay; radiological surveys at nuclear tests; supporting radar site construction in Greenland; airlifting to crash sites and search-rescue tasks. This busy squadron has no time to waste on an accident.

★ ★ ★

391st Tactical Fighter Sq, England AFB, La. TAC

All fighter types will agree that logging 8540 hours since 1 July 1957 without an accident means heads-up flying of a high order. This F-84F & F-100 squadron preserved this flying safety record while pursuing its regular tactical and training curriculum and while maintaining a "Double Trouble" alert status for six months. Nearly 5000 takeoffs and landings without incident add another grace note to the unit's splendid record.

★ ★ ★

49th Tactical Fighter Wg, USAFE

This unit had the lowest accident rate of the F-100 Wings in their command for the award period. They flew 14,479 hours in predominantly adverse weather with a 13.8 rate. This is especially praiseworthy in that the rate for the previous six months was 35.4—proof that teamwork in accident prevention by pilots, maintenance and support personnel will abate the rate. They're shooting for an unbeatable ZERO. Here's luck!

★ ★ ★

461st Tactical Fighter Sq, Hahn AB, Germany. USAFE

The airpatch this squadron calls home has the worst weather of any USAF base in Europe, according to their weather office statistics. Yet, for one year, while flying 8562 hours and accomplishing 4389 sorties with many inexperienced pilots, they maintained a ZERO accident rate. Their adverse operational environment includes a short (for the flapless F-100C) 8000-foot runway which, when drag chutes fail, automatically means a barrier engagement because of the wet, icy or snow-covered braking surface. Can't beat ZERO!

★ ★ ★

94th Troop Carrier Wg, Hanscom Field, Mass. USAFR

This fine Reserve outfit flew 4801 hours without an accident during the award period. Its mission is to maintain operational effectiveness of airlift personnel and equipment, accomplish medium range airlift of supplies or personnel, and perform evacuation of personnel, units and material under all weather conditions. In carrying out this task, they flew 797,951 passenger miles and 277,220 ton miles.

446th Troop Carrier Wg, Ellington AFB, Tex. USAFR

Even though transitioning into the C-119 during the award period, the 446th racked up 5113 accident-free flying hours. This style of flying safety operation is old hat to them, however; they haven't had an accident since February 1956. In the six months for which the plaque is awarded they not only effected their transition program but managed 14 swift-lift and nine Ready Swap missions, plus a hurricane evacuation.

★ ★ ★

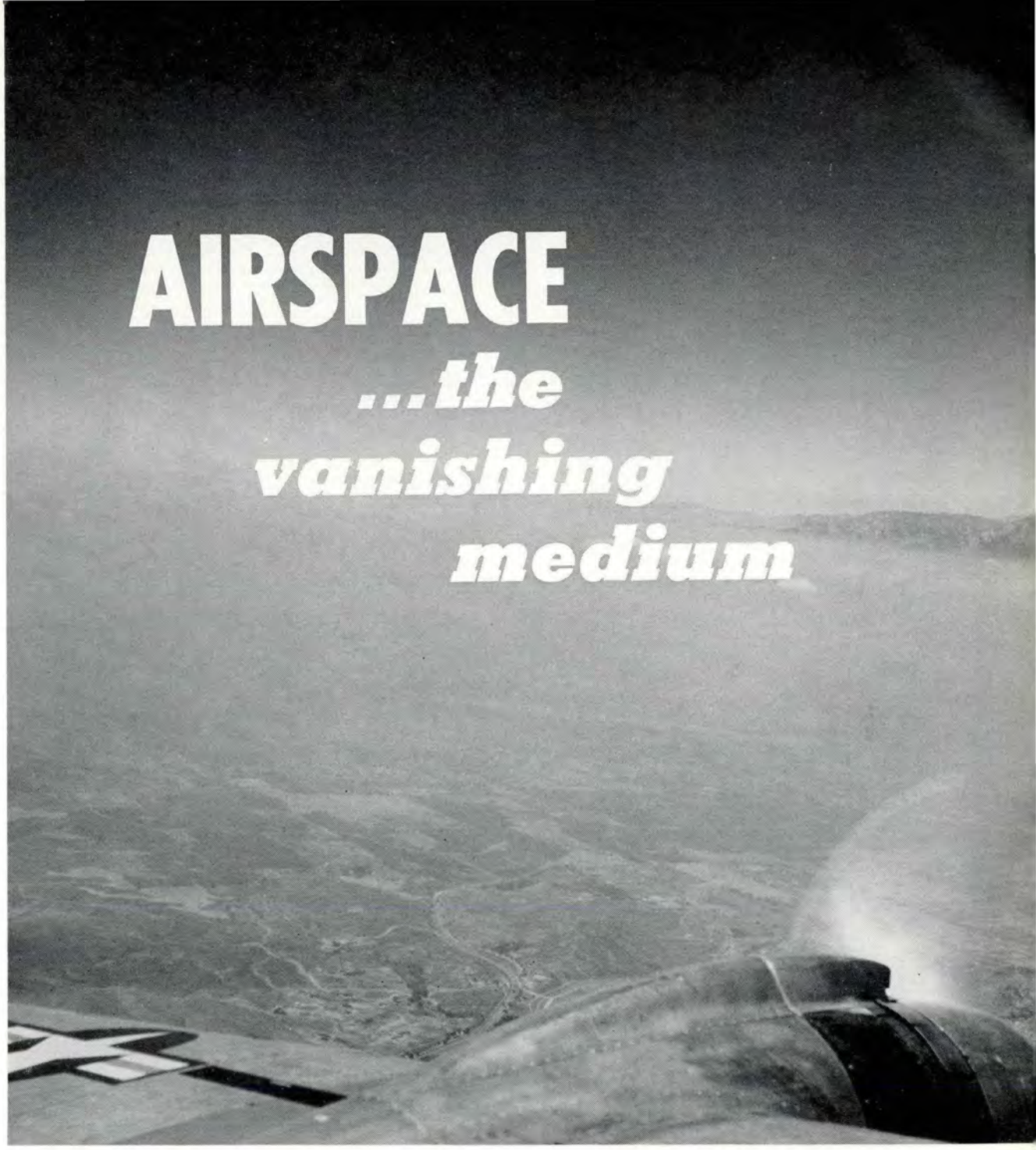
137th Tac Ftr Sq, Westchester County Aprt, N. Y. ANG

This Squadron flew more than 2000 hours without an accident during the award period, and has not had a major accident in the last 30 months (15,000 total hours). This outstanding record was established as the unit transitioned into the F-86H aircraft, and while the organization changed from an Air Defense to a Tactical Fighter outfit. Their 6500-foot runway, with the dip in the middle, keeps them on their toes.

★ ★ ★

115th Tac Ftr Sq, Van Nuys Aprt, Calif. ANG

The 6000-foot runway, extensive runway construction and high density Los Angeles area traffic which hamper this topnotch outfit's operations did not prevent them from flying 5409 accident-free hours from January through December 1958. During this period they transitioned into F-86F aircraft without an incident. The Squadron has attained 100 per cent aircrew operational readiness and 100 per cent aircrew qualification in aerial gunnery. An excellent year's work!



AIRSPACE ...the vanishing medium

Major J. A. Gascoigne, Washington Airspace Division, Air Traffic Control Branch, Hqs. USAF

In the past decade the Aviation Industry, the Military Services and the public at large have been bombarded by such phrases as "Our diminishing airspace," "Limited capacity of the System," and "Airspace, our most rapidly vanishing natural resource," until the phrases have become trite and meaningless.

Is there really a problem of the magnitude indicated by these hackneyed phrases? We can approach an answer to that question by employing another cliche — "Where there's smoke, there's fire."

Yes, figuratively speaking, the demand for airspace is increasing at an alarming rate.

Let's take a closer look at the problem and how we must meet it.

It all started on December 17, 1903. Prior to that time our airspace, with the exception of an occasional balloon, was strictly for the birds! Then the Wright Brothers launched the first heavier-than-air machine. That in itself was no airspace problem. But, shortly thereafter, they launched a second one and then the fun began! There was at that time a chance for a mid-air collision. Admittedly, the chances were remote, but if the idea is carried forward to the present with approximately 100,000 aircraft in the United States today, the odds in favor of a mid-air collision increase substantially.

How is it that we find ourselves in this predicament of "running out of

The increase in operational speeds during the last 15 years has been phenomenal.

airspace?" The situation is a logical result of years of complacency with what we imagined to be a huge surplus. It has only been within three or four years that Air Traffic Control and airspace utilization have come into their rightful prominence in aviation planning. And this late recognition was perfectly natural. The word "airspace," in itself, suggests vastness and limitless availability. The navigable airspace was a plentiful resource, but now like petroleum or even water, we have come to know it as one of our most valuable commodities. The demand has multiplied many times over and the supply has not and cannot increase.

Every means of transportation has been required, sooner or later, to submit to some degree of traffic control. The history of efforts to enhance safety through control shows that progress usually lags demand. This is evidenced by the number of fatalities suffered on our highways today. Even the train, bound as it is by steel rails, is not immune to collision hazard.

In discusing the problem we could paraphrase learned expositions on "Rates of Closure" versus "Perceptual Reaction Times," and so on, but this would only be redundant in view of the really authoritative articles published on the subject. Suffice it to say only that the problem stems from the variations in operational characteristics betwen the DC-3 and our modern Century Series interceptors.

Granted there is also a wide variance in the operational altitudes of general aviation and the jet airplane which tends to lessen the possibility of aerial conflict; nevertheless, all manned vehicles which leave the surface of the earth will, at a pre-planned time and sometimes sooner, return for an approach and landing. If all the aircraft previously referenced were spread evenly throughout the available airspace, the problem would be negligible. This is unfortunately not the case. Instead, they tend to "bunch up" along airways and particularly in terminal areas.

During World War II, the P-51 and the P-47 were about the hottest aircraft going. Compare these with our present day Century Series that are capable of spectacular performance. The increase in operational speeds during the last 15 years has been nothing less than phenomenal. But that isn't all. The "Peashooter" was easily maneuvered and flying "see and be seen" presented no insurmountable problem. The "Centuries?" Quite a different situation. When an F-104 is launched on an active air defense scramble, the aircraft is climbing so steep and fast that the possibility of collision avoidance based on visual means is greatly reduced.

Flight testing is taking its share of the airspace. Fifteen years ago research testing could be conducted at a few bases and operations generally were confined to a relatively small radius of the base. Here again, speed and radius of turn can be directly applied to the amount of airspace needed for this very important work. We don't have to examine classified reports to be aware of the tremendous speeds that are now common to everyday tests.

Weapons? It was only a very few years ago that the .50 caliber was our common weapon for range practice. Compare the airspace requirements of this weapon and its subsonic carrier with that needed for rocketry in Century Series interceptors. In this same category, let's also take cognizance of missile activity, practically a newcomer to the demand on airspace. The tremendous advances in range and frequency of firing bear obvious impact.

In late 1957, the Air Force initiated action to establish more than 20 Caution Areas for training purposes. This program understandably met strenuous opposition from other airspace users until the tragic mid-air collisions last year. Emphasized realization then compelled a more sympathetic attitude for our problem. Joint FAA/Air Force teams began to outline criteria for training areas which would segregate those military operations considered incompatible with civil interests. Briefly, these criteria were applied to those operations which, because of volume, high speeds or unusual attitudes did not lend themselves to air traffic control or to VFR "see and be seen" operations.

This demand for airspace has been with us since the advent of the jet airplane. It has only recently been defined and identified.

Even television is in the act. Very high towers are being constructed throughout the country. Engineers have said that 5000-foot towers are not fantasy; they can be constructed. The aviation and airspace problem is obvious. Television serves a principal community interest and often the best tower site would pose a major problem for aviation. Military and civil aviation and television are all in the public interest. The airspace implications must be studied and an equitable solution must be reached. In short, the airspace must be equitably divided.

Let's take a look at the fantastic growth of our airways system. In 1948 there were 56,069 miles of airways as compared to 205,087 miles at the end of 1958. These mileages begin to appear significant when we realize what, as a consequence, has happened to our terminal procedures. The jet penetration has been squeezed and the departure is very rarely a straight-out on-course climb. By and large, there aren't any so-called "clear quadrants" anymore. That free-wheeling "elsewhere" airspace is history.

The military forces have enjoyed relatively free use of the upper navigable air. Until last fall, commercial air carriers and other civil aircraft generally had a top operating limit of 23 to 25,000 feet. Not so any longer. The civil jet is pulling contrails with us at 35 and 40,000 feet. What does this mean to us?

Well, heretofore, we could operate despite the deficiencies in the air traffic control system at these altitudes, in the interest of getting our job done. Now with civil passenger carrying aircraft competing for this airspace, our problems have increased. To provide necessary safety for these civil carriers, high altitude Radar Advisory Routes came into being. The Air Force made available its vast air defense radar net as a massive assist to the Federal Aviation Agency to meet this new demand for increased safety and sophistication of airspace management.

We know where we stand, of course, but when we reach the question of where do we go from here, the problem obviously is of no small magnitude.

An economist, commenting recently on the dismal fiscal condition of

many of our states, remarked that we lost 15 years of capital improvements as result of the depression and WW II. He went on to say that our present financial condition can be attributed to our tremendous drive and need to catch up. While we are not speaking primarily of dollars, there is a direct relation to the management of our airspace. For years, money was not available to modernize the air traffic control system. Progress was slow and tedious, an uphill battle all the way. Now suddenly, in the past two or three years, there have been distinct improvements in appropriations. But like the economist who cites the loss of many years of capital improvements, so it is true with our air-space management system — air traffic control.

We hear of remarkable developments in air traffic control automation but the mysterious black boxes and push button controls are hard to come by. True, the experts are working feverishly to push new air traffic control tools through design and test phases. A tremendous task faces these people who have plunged into the maze, dedicated to come up with the answers that were due yesterday.

Our efforts to make maximum use of airspace must be increased even more. The days are long gone when we could operate at random. For example, time was when we could set up a Restricted Area for gunnery work and feel content that even though it would not be used continuously, it was best to set it aside as a full-time reserved area. This is no longer true. We must consider joint-use possibilities in every case. At certain times or during adverse weather conditions, the area may revert to regular air traffic use. A share and share alike attitude must prevail.

In the meantime, what else can we do in the Air Force? Perhaps the most we can contribute in a practical everyday sense, is to assist every pilot by making him acutely aware of the problem. The pilot, as good as his flying techniques may be, must endeavor to be a model of perfect precision. Many changes in the rules can be expected; many new terminal and en route procedures will be adopted; charting practices will change; there will be new communications requirements; specialized systems for particular activities will be designed for local, perhaps national application; aviation information will be pounded out in several publications, and you — the pilot — must stay on top of every change for every flight.

The next step: operations supervisory personnel will have a formidable job. There really is no change to any of your responsibilities of the past; they simply become more exacting. You've got to get the "word" out to the pilots. Nothing new about that, is there? But now you must be ultra-certain that your message is getting through. Only constant attention will do. The job of reviewing your arrival and departure procedures is a constant task nowadays. What kind of IFR delays are you getting? That and similar questions must be a daily inventory of how your local situation is progressing.

There are countless measures that can be taken by each echelon of command to help get better use out of our airspace. Probably one of the best tests that can give you an answer as to what specifically must be done, is a question simply put: does this operation involve airspace utilization? When the answer is affirmative, look into the situation. Is the airspace to be used judiciously?

Whether you are concerned with flying a VFR traffic pattern or must plan the first launch of our newest missile, availability of airspace is a prominent factor in the success of your operation. Airspace has become a scarce commodity and must be used wisely if the Air Force mission is to be accomplished most effectively.

Airspace economy and management are the watchwords! ▲

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The Lowdown on the Lanyard

Recently, another pilot was killed during attempted ejection at low altitude. Investigation disclosed that the parachute streamed and was approximately one second from full deployment. The pilot did not have his zero second parachute deployment lanyard connected although this emergency occurred quite sometime before escape was attempted. It was concluded that use of the zero second lanard would have prevented this fatality.

Overall USAF ejection experience indicates a very significant increase in the number of successful ejections attempted below 1000 feet. During the first three months of 1959, 71 per cent of all ejections attempted below 1000 feet were successful as opposed to 44 per cent for the same period during 1958. The proportion of ejections attempted below 1000 feet for both periods was approximately the same. Increased availability and use of the zero second parachute lanyard is reflected in the current high per cent of successful low-level ejections. Preliminary information indicates that the zero second lanyard was a definite or probable factor in at least nine of the 12 successful ejections below 1000 feet.

The following account by a pilot who ejected at 200 feet as a result of a flameout illustrates the role of the zero second lanyard during low-level escape.

"I was in about a 20-degree bank when I left the cockpit. I was in a mental fog at the time of ejection and felt confused and disoriented after I left the plane. I know that I tumbled two or three times, but was not aware of my separation from the seat. The oxygen mask blew over my eyes. I regained my equilibrium and the mask came away from my eyes at the same time. I was about 50 feet above the ground in a face-down position. I saw and heard the ejection seat hit the ground directly below. An instant later I felt the chute deploy. I straightened out and hit the ground right beside the seat. As I stood up I saw that the plane had beaten me to the ground about 100 yards away."

Although the rate of success in low altitude ejections has shown significant improvement, prompt action once the decision has been made to eject cannot be over-emphasized. Unanticipated delays in effecting ejection and seat separation have been reported with resultant loss of valuable altitude. This could be fatal at low altitude, in spite of the availability and use of low-level escape equipment. ▲

Sometime early in 1961 the Air Force will have a supersonic trainer, the Talon T-38. With its duality of engines and other systems it has many built-in safety features of interest to Air Force pilots. Here then is the . . .

T WITH TWO

J. J. Quinn, Engineering Test Pilot, Northrop Aircraft, Inc.

With the first flight of the T-38 now history, the Air Force has the eventual successor to the venerable and trusty T-33. On 10 April, Lew Nelson, Northrop's Chief Engineering Test Pilot, took the new twin-engine supersonic trainer up for a 42-minute hop and reported that the design boys had outdone themselves. Of course, Lew was not entirely surprised because just three weeks earlier he had "inadvertently" flown a short distance during the taxi tests at Edwards Air Force Base. Lew claims that he had only intended to get the nose gear off when he found himself airborne about six feet.

The T-38 is really one of the second generation of supersonic aircraft. Northrop is free to admit that the designers of the "Talon" pay tribute to the experience gained in building the previous faster-than-sound birds. In fact, special care was taken to incorporate into this jet all the best that the aviation industry knew. The result is an airplane especially designed to train pilots for a new generation of space-age vehicles. It is the first trainer to be capable of delivering Century Series fighter performance. Chemically-fueled bombers, a new generation of fighters, and boost-glide vehicles are expected to go into service within the operation life span of the T-38. Many of these craft will be flown by pilots who will acquire their first supersonic flight experience in the T-38.

But let's make a rundown of the external features of the Talon before going any further. This lightweight-concept plane (about 5000 pounds without fuel, engines or other gear) is almost 43 feet in length and has a wing span of 25 feet 3 inches. The wing is low and thin and the all-movable horizontal stabilizer has a distinct negative dihedral. The wing leading edge is swept back 24 degrees, the tail rises to 12 feet 11 inches and the tire tread is 10 feet 9 inches. Two speed brakes are located on the lower fuselage under the wing. Two lightweight GE J-85 engines with afterburners are to be used in the production model and they are placed side by side in the aft fuselage. These power plants have an exceptionally high thrust-to-weight ratio and make possible a significant weight-saving overall. The T-38 fuselage lines are characterized by reverse of "Coke bottle" curvature at the wing junction in conformance with the "area rule" theory of design. There are no external wing tanks, all the fuel is stored in fuselage.

Inside, the instructor and student will be seated tandem, in pressurized, air-conditioned cockpits. The two will be enclosed by separate jettisonable canopies and the instructor is seated behind and 10 inches higher than the student to give proper surveillance and forward visibility.

Both cockpits have ejection seats of course and in case bailout is necessary, the instructor is protected from windblast by a transparent plastic panel during the interval between the student's ejection and his own.

The plane's cockpit was designed with the pilot in mind. There are 30 inches of width for the man with wide shoulders and wearing a moon suit. The instrument panel is 10 inches high to reduce eye movement required to read the instruments. The landing gear controls are on the instrument panel and all of the controls necessary to operate the plane are in front of the elbows. Automatic temperature control and an auxiliary ram air vent are available. The cockpit pressurization is also automatic.

Performance-wise, the Talon is no slouch. It will have a service ceiling in excess of 50,000 feet and a maximum speed far in excess of Mach 1. The maximum power ground run at takeoff weight of 11,000 pounds will be about 2000 feet and the rate of climb at sea level will be in excess of 30,000 feet per minute. The inboard location of the twin-engine power plant ensures negligible trim changes for single-engine flight. The range will be about 1100 nautical miles for a navigational training mission of two and one-half hours. The maximum endurance mission will be three hours and the supersonic training mission with 10 minutes in excess of Mach 1.0 will be one and one-half

hours. Both of these latter figures include 30 minutes sea level loiter. At maximum weight, with gear and flaps down, it will be capable of takeoff, go-around and landing on one engine.

The mechanic should like the Talon. The waist-high, lightweight airframe will facilitate handling and access. The aft fuselage section is removable by detaching six bolts for engine work, and a built-in track and roller arrangement expedites engine removal. Vertical tail and control surfaces are not disturbed during engine servicing or removal and the oil tanks are engine mounted. Most of the larger engine accessories are airframe mounted and have simple disconnect features. Access doors are liberally distributed and readily detachable. The single point refueling will be good for the maintenance man and will reduce cap inspection time, so irksome to the pilot. Lightweight dollies have been designed for ease of removing engines and tail sections.

The true value of the T-38 for the pilot and the Air Force is in its dual system concept. Basically, the prime factor here lies in its dual engines. Either engine can provide all electrical and hydraulic power required to operate the aircraft. Each J-85 engine has an independent fuel supply system. Fuel for the left engine is provided by a forward fuselage tank and a dorsal tank located just aft of the canopy. Fuel for the right engine is supplied by center and aft fuselage tanks. Fuel sequencing or crossfeed is not necessary during normal flight but a manual crossfeed is provided so that all fuel can be sequenced to one engine.

Full power flight control systems are used for operation of the ailerons, rudder and all-movable horizontal stabilizer. Either engine can supply hydraulic power for the flight control operation as noted above. The "feel" for the controls is provided by control force springs in the aileron and rudder. Longitudinal feel comes from a spring and bob-weight combination. The Talon can be flown and safely landed using one aileron in case of damage to the other.

This partial list of safety features which were deliberately designed into the Talon should convince the greatest skeptic that Northrop has come up with the answer for a safe basic trainer. The T-38 incorporates all of the qualities of modern combat aircraft, while still maintaining top standards for student flying safety. ▲

SAFETY FEATURES OF THE "T" WITH TWO

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- Fuel system requires no monitoring other than watching two fuel gages. The system is turned on prior to flight and off at completion.
- Landing gear control lever and indicators are located on the instrument panel.
- Oxygen regulator easily accessible and visible. Cabin pressurization is an adequate 5 psi.
- Engine starting sequence is a two-step, fully-automatic operation. Airstart is identical with the addition of airstart ignition switch operation.
- Emergency landing gear operation is accomplished in two simple steps.
- Cockpit canopy locks when closed. Any movement short of locking allows canopy to raise.
- Only two fuel caps are installed. Normal operation uses the single point refueling feature and neither of these caps should require constant checking as they will be removed only for maintenance.
- Nose compartment doors cannot be closed without locking.
- Nosewheel steering provided for better ramp, takeoff and landing control.
- Very high thrust—weight ratio.
- Two-engine reliability.
- High allowable Mach 1.6 plus. No danger of loss of control in dives.
- Excellent cockpit layout reduces chances for pilot disorientation.
- Excellent instructor visibility from rear seat.
- Better maintenance due to more easily accessible parts.
- Landing gear design reduces porpoise probability.
- All fuel will gravity-feed.
- Fuel filter is located in warm engine bay to prevent ice formation.
- Twin generators reduce chance of complete electrical failure.
- The primary electrical system is alternating current which powers all flight instruments.
- Twin-engine reliability and the rocket ejection seat reduce chances of personnel injury. Low altitude ejection fatalities should be reduced 95 per cent by these two features.

Well Done

K N O W L E D G E • T R A I N I N G

First Lieutenants

JOHN E. KRINGS • ALVIN L. COFFEY

113th Fighter Interceptor Squadron, Hulman Field, Terre Haute, Indiana ANG

The two F-86As—performing in-trail acrobatics—were ratting around at 10,000 feet when Lt. Krings felt a severe vibration in his aircraft. He first thought his landing gear had extended so he pulled up in a steep climb, reducing power and extending speed brakes, in order to recycle his gear. Checking revealed no gear malfunction, but by this time Lt. Krings realized it was something far more serious than vibration caused by a loose access panel or a hanging landing gear door—the engine had failed! Three buckets had been thrown through the engine and out the right side of the plane, but this the pilot learned much later. His first reaction was to stop-cock the engine, then clean up the airplane—jettison tanks, speed brakes in—and head for Hulman Field, 20 miles away.

In dropping the auxiliary tanks the pitot boom was severed, leaving Lt. Krings without an airspeed indicator. This doubly compounded the problems of a flameout-type approach and dead-stick landing. Lt. Coffey, the flight leader, joined Krings on his left wing and called out airspeeds. The possibility of making the field or bailing out was discussed. Krings decided to descend to 2000 feet and make the final decision there. When he reached this predetermined altitude and found himself in an advantageous position he elected to try a landing on runway 18, just under 4000 feet long.

To keep the crippled aircraft from sacrificing any of its desperately needed altitude and gliding distance, Coffey told Krings to hold off landing gear extension until he was sure the trees and powerlines at the end of the runway could be cleared. Shortly after the gear was extended on Coffey's signal, the '86 touched down on the main wheels—but the nose wheel was not fully extended.

The flight leader, still flying along side, advised Krings to pull the emergency nose gear lanyard while holding the nose gear off the runway. Krings complied, the gear extended and locked, the nose wheel touched down and the pilot braked to a stop. The Sabrejet, tires and gear intact and with no further damage, was 500 feet off the end of the runway. At the time of this incident, the pilot had only 12 hours in the F-86A.

This display of cool thinking, airmanship, and team effort saved the Air National Guard and the Air Force of the United States an expensive jet aircraft. Well Done! Lt. Krings and Lt. Coffey. ▲

Col. LORAN D. BRIGGS

28th Bomb Wg (H), Ellsworth AFB, S. Dakota

At 0800 MST on 9 September 1958 the B-52 made a scheduled takeoff for a routine training mission. Col. Briggs as IP flew from the right seat, while a pre-solo trainee pilot went through his paces in the left. Unstick was at the predicted 141 knots indicated, but just after takeoff the aircraft pitched upward and assumed a high rate of climb at a radically low airspeed. Both pilots applied nose-down elevator control pressure, but their efforts were completely ineffective. The control column—later inspection revealed—was locked in the full back or nose-up position because of an improperly installed bolt in the mechanical linkage. The IP applied nose-down stabilizer trim, utilizing the full nine degrees available. The violent pitch-up condition was no sooner brought under control at 1000 feet, however, when a sharp 2000 foot per minute rate of descent had to be dealt with. Again, the stabilizer trim correction accomplished its task, and the huge aircraft, its flaps now raised, levelled off and was coaxed into a climb to 34,000 feet.

For the next five hours, flying in the local area, Col. Briggs thoroughly familiarized himself with the new flying characteristics of his giant B-52. After an extended series of practice descents, level-offs and climbs using various power, flap and airbrake settings, he was confident that he could safely land the plane at its home base. He decided that a center of gravity condition of 27 per cent of MAC at a landing weight of 260,000 pounds would give the optimum positioning of stabilizer trim for making both nose-up and nose-down travel available at landing. When the gross weight had been reduced to 260,000 pounds, gear and flaps were extended and the aircraft descended to traffic pattern altitude.

On the attempted flare-out from the first landing approach the aircraft nosed sharply down as soon as the power was cut, the forward main gear contacting the runway. With power applied for a go-around, the severe pitch-up that resulted was again controlled by stabilizer trim. The next three approaches were experimental, varying the airbrake settings and approach angles. On the fifth attempt, the landing was completed, the costly B-52 intact, its crew unharmed.

For a splendid example of airmanship and superb pilot technique, Well Done, Colonel Briggs! ▲

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1st. Lt. ALAN B. DUNN

20th Helicopter Sq, Sewart AFB, Tenn.

The H-21B was returning at night to its home station with a crew of three aboard after completing a mission at Alpena, Michigan. Lieutenant Dunn, copilot, was at the flight controls while the pilot busied himself with the navigation. They were flying 800 feet above the terrain. Suddenly, the engine quit.

Lieutenant Dunn immediately put the helicopter into autorotation and headed toward a small field he could see faintly outlined by moonlight. The pilot, deciding against taking the controls at such a critical time when he would lose precious seconds re-orienting himself, let Lieutenant Dunn proceed with the emergency landing while he flipped on the searchlight. The glare revealed the field almost underneath them.

Lieutenant Dunn abruptly decreased the speed of the aircraft, which increased the rate of descent and enabled him, through skillful flying technique, to guide the helicopter into the small field below. The touchdown was smooth, with an after-landing roll of only one foot. The elapsed time between engine failure and reaching the ground was only 25 seconds. With the high rate of descent resulting from the precariously low airspeed, a safe landing would have been difficult under daylight conditions. With the additional handicaps of darkness and the small, uneven landing area, the resulting safe recovery was doubly commendable.

Lieutenant Dunn's clear thinking, professional pilot technique and his sound judgment saved the United States Air Force one H-21B helicopter and the lives of three crewmembers. Well Done! ▲

the GOONEY that lit on the low house

Sam Haines looked up at the low hanging clouds, at the light snow falling lazily to the ramp, shook his head slowly then turned and went in the door of base ops.

"Never fails," he muttered to himself. "When I'm strapped to that desk in the puzzled palace you can see clear to Richmond. Now, look at it."

He let himself in the door, closing it quickly behind him and walked into the weather section.

"Whatcha doin' to me today, Jim?" he asked the forecaster. "Don't I ever rate some field grade weather from you weather types?"

"Not today, Major," said Lt. Jim Bridges, "Where do you want to go today? Not that it matters—you're stuck with this light snow or rain in any direction from here for at least another 14 hours."

"Looks like I'm committed to take a trip down to the sunny South, Jim. North Georgia to be exact. Is it this way all the way down?"

"Not quite, Major, but you'll have to crack a 2500-foot ceiling almost anywhere on the Eastern Seaboard. Gimme your destination and I'll check the sequences for you."

"Thanks, Jim, check from here to Marietta and I'll be back in a couple of minutes with the '175. Gotta check with the other crewmembers in ops."

Sam went over to the ops counter, picked up a blank '175 clearance form and took a slow look around the room. Spotting the two pilots who were to make the trip with him, he walked over to them.

"How are you, Colonel McGee? All set to go?"

"Howdy Major. Guess you're the lad who's going to give me the recheck in the old Gooney on this trip. What do you think? Are we going to make it through the muck and mire?"

"I think so, Colonel. Is this Colonel Hanks with you?"

"Yes, Major, I'd like to have you meet Colonel Hanks. An old friend of mine. Wants to get out of this snow for a while. Maybe he can get in a little stick time on the way down."

"Glad to have you aboard, Colonel. Shouldn't be too much trouble on that score. Guess I'd better get with this flight planning."

"I've already started on the navigational log, Major," said Colonel McGee. "I figure we'll be three and a half hours getting there with the winds the Lieutenant gave me."

"Thanks, Colonel. If you'll pick up some charts for the route I'll be right with you as soon as I get this thing filed and the passenger list checked."

One hour and 10 minutes later Sam as IP was in the right seat of the plush Gooney with Colonel McGee holding down the pilot's cushion. Externally, the old bird seemed to be ready to leap and the precip apparently was melting as soon as it hit the plane. Maybe piling up a bit in spots but it should blow off as soon as the takeoff was started. Sam had finished running through the checklist with the Colonel and needed only to get the IFR clearance before they were ready to go.

"All set, Colonel?" Sam asked.

"Right," said Colonel McGee. "What was the latest local visibility they gave you?"

"The man gave me 1000 feet overcast, 3/4 mile visibility with light snow and fog," Sam answered. "Should top this stuff at 6000 though. I'll call in for the clearance now, Colonel."

Two minutes later Sam hung up the mike, adjusted his earphones and turned to the pilot.

"We're ready to go, Colonel. It'll be a left turn after takeoff to the Riverside Radio Beacon. I've got it tuned in for you and I'll contact Radar Departure Control as soon as we get airborne. I'll follow you through on the throttles and tap your hand when you get to 40 inches. Then you can concentrate on the bird. I'll check all the gages and give the Chief the gear-up signal."

"Okay, Major, let's get this thing off the ground."

Sam looked out at the right wing to check for snow accumulation then turned on the prop anti-icer fluid just before locking the tail wheel.

"Tail wheel locked," Sam shouted, and poised his left hand above the throttle quadrant.

The C-47 accelerated slowly toward the far end of the runway. The 17 passengers in the rear settled themselves, some taking a last look at their safety belts, others reaching for pocket books or magazines to while away the hours before touchdown at Marietta. The crew chief crouched down between the pilots' seats, ready to raise the gear at Sam's signal. Everything was in the green. No strain on this one, he thought.

The takeoff appeared to be normal to both Sam and the Colonel up to

the time the Gooney broke ground. Airspeed climbed steadily to 100 mph and Sam motioned for the Chief to raise the gear. It was at this time that things began to fall away. At the moment the aircraft passed through 75 feet altitude, Sam noticed a deceleration to 80 mph. The old bird began to vibrate. Witnesses said they saw an extremely nose-high takeoff condition. The airdrome officer, watching from inside base ops, yelled to the dispatcher, instructing him to alert the crash vehicles. The control tower operator watched, fascinated at the struggles of the game old Gooney and then alerted the crash net. All other witnesses agreed that the power seemed to be up to normal. It just seemed that the nose was too high for the engines to have a chance.

Sam was more busy than somewhat all this time. He advanced the throttles to 50 inches but still got no acceleration. The bird began to vibrate in a stall. Sam took over from the Colonel, checked the instruments once more, and noted no apparent malfunction. Airspeed continued to fall off and it was now certain that this time there was to be no takeoff.

With Sam struggling to pick a clear spot, the aircraft mushed into the ground in a level attitude. Just as ground contact was made, Sam cut the power and called for switches to be cut off.

It was at a point 150 feet farther on that the left wing struck the low house of the skeet range. The squat building was demolished and seven feet of the left wing sheared off and remained mingled with the broken boards. Sam held grimly to the wounded bird as it slid 1300 more feet and came to rest on the retracted gear. Sam was lucky this day. Not one of the crew or passengers suffered any injury. All that remained for Sam to worry about was the WHY!

The aircraft accident investigator got to the scene within minutes after the plane slid to a stop. He was told by the crew that there was no loss of engine power prior to the crash. He saw that an accumulation of stiff slush covered the trailing half of the wings and by this time a light cover of visible snow was beginning to form over the entire aircraft.

Next the investigator went to the point of initial ground contact and retraced the path made by the Gooney. With the information then available and evident, he was rather puzzled to say the least. What made the old lady give up this time? Further study would be necessary to pin this one down.

The first obvious clue to the cause of this accident came from the extreme nose-high attitude noted by the crew and observed by ground witnesses. An error in weight and balance computation could well be the answer. It was noted that the base uses pre-computed DD365F's and any loading which is less in weight and within the MAC limits of the pre-computed DD365F could be certified by the pilot according to group policy. Contrary to the provisions of paragraph 4a, AFR 60-20, the instructor pilot, Sam by name, did not compute a DD365F. Information was gathered as to the actual load aboard at takeoff. When this information was computed, it was found that the maximum allowable per cent of MAC (28 per cent) was actually used for the flight.

It was recognized that the loading information received from the crewmembers and used by the board in its computation could be different from the loading that was actually in existence at takeoff. Thus, the per cent of MAC could actually have been forward to 27.5 per cent or, conversely, aft to 28.5 per cent. Two tool boxes in Section I, far aft, were weighed after the accident and found to be 155 pounds, 95 pounds in excess of the allowable.

It had been snowing for a period longer than one hour and a half before the accident occurred. On the preflight visual inspection it was observed that the snow was melting on contact with the aircraft surface and running off in the form of water. However, it was approximately 30 minutes later before a visual check of the wings was made from inside the cockpit and the pilot was aware that the temperature was 33°F. During this 30-minute period an accumulation of slush had formed on the wing surfaces outboard of the engine nacelles. This was not seen by the pilots but was seen by the third pilot aboard. He did not consider it a hazard and did not tell the Instructor Pilot. With the outside temperature at 33°F, this slush solidified enough to adhere to the wings at takeoff.

The pilot was not advised of the tail heavy condition which existed for this flight. (How could he be? Sam was not aware of this condition himself.) Nor was he advised to use other than the one degree nose-up trim which he'd established for takeoff. Power was added for takeoff, and lift-off occurred at 80 to 90 mph. After the airspeed reached 100 mph and the gear was coming up, a change in pitch attitude (more nose up) occurred which was apparently not recognized by either pilot immediately. This pitch attitude, exaggerated by the tail heavy condition, caused a sudden deceleration to 80 mph. With the ice accumulation on the wings, the aircraft entered a stall. The addition of power to more than 50 inches could not break the stall.

The pilot was not current in the C-47 and was being given a re-qualification check by the IP. The IP, however, performed the major part of the preflight planning except for filling out the navigation log. The Board considered it poor judgment for Sam to expect the Colonel to perform the mandatory re-check maneuvers required and still make an IFR flight with a plane-load of passengers.

Two violations were noted in addition. The weather briefing was not extended as required by AFR 60-16, and the landing gear was retracted by the chew chief. Not a direct cause, either of these, but indicative of the general tenor of the flight.

Air discipline begins long before the plane is airborne. Inattention to detail on what would seem to be a routine flight will never be forgiven even by the friendliest of aircraft. And they don't get much friendlier than the C-47. Preflight planning is the first step in air discipline for the entire flight. ▲

MAN in the MOON

Notes on fitting the MC-4 partial pressure suit at March AFB. Model's name withheld.

The close fitting suit retains body heat and causes profuse sweating. Two pairs of cotton long johns come with each suit and are worn seam-side out to prevent seam bruises when pressure is applied. They also absorb sweat and prevent skin chafing. Suit follows sitting position body line.

Rubber bladder, which forms neck seal by means of an in-turned cuff, is pulled over the head. The cuff is made for a small neck, but can be cut larger. The frame and earphone pads are worked into position and the face ring settled in place.

SUIT

The inelastic nylon and cotton partial pressure suit applies mechanical pressure to body by means of pneumatic levers called capstans. When capstan tubes inflate, suit fabric is drawn tight. Pilot is skin-fitted into $800 (approx.) suit with lacings drawn by a 10c crochet needle. Flying boots are worn half-laced to allow room for capstans.

When suit inflates, helmet is held securely on head by tie-down tape on cable under chin. Test button on seat kit lets pilot check emergency capstan pressure. Bottled air provides safety for pilot above 63,000.

Any questions on the new Flight Information Publications? Most of the answers to why, how and where will be found right here.

F. H. Redmond, Aeronautical Chart & Information Center

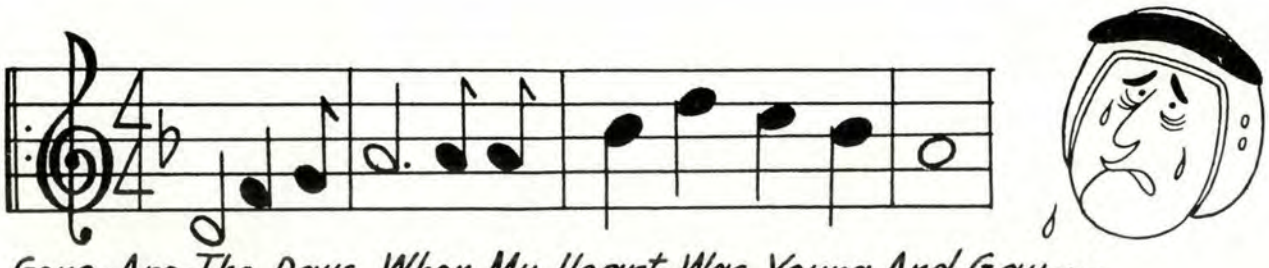
Gone are the days when we could walk into base operations, file a flight plan, crank up the bird and be airborne in 15 minutes or less. Gone, too, are the early aids to navigation (maps furnished by Standard Oil and the Brotherhood of Locomotive Engineers and Trainmen depicting the concrete, asphalt and iron compass routes). Gone, recently, are what we had come to know affectionately as the Bibles, all replaced with products specifically designed to better satisfy the needs of the modern throttle jockey. We buried the "good books" as reluctantly as we did the last biplane, for they had served us well but they no longer did the job. They grew to bulky and unwieldy proportions, contained duplications, and included information no longer used—all presented without logical sequence.

Replacements for the good books have been in the field for several months. They comprise what is called the FLIP program (for Flight Information Publication). The principle behind this program has been to categorize information into the phase of operation in which it is used: Planning, En route and Terminal. This doesn't mean that the en route and terminal documents are not required for planning, but it does imply that planning information is not normally needed in the air. Hence, a second concept: leave on the ground any material that is not needed in the cockpit.

The following will explain some of the why, how and where flight information is presented in the FLIP program.

Low Altitude Flight Planning Chart. A wall Flight Planning Chart covering the United States is under development. It will be available for your use in base operations as soon as possible sometime in 1959.

In developing this chart we are attempting to portray sufficient information to permit you to visualize the big picture. This chart will permit you to make your prelimi-



nary route selection; your detailed navigation flight planning can be accomplished by reference to the FLIP En route—Low Altitude.

Planning. The Planning FLIP for the North American Area was issued in July of 1958, and the Supplementary Flight Information Document (SFID) discontinued. Several copies should be in every base operations office.

This FLIP is provided in a looseleaf binder (Air Force blue) which bears the name Flight Planning. The name has been changed to Flight Information Publication — Planning, but we'll be using the old binders for a while. Divider cards are used to identify the area of coverage and the content.

Section I. Planning FLIP. This section was published in January 1959, the same time as was the new En Route Low Altitude package. Note how the contents of this section support your other FLIPs.

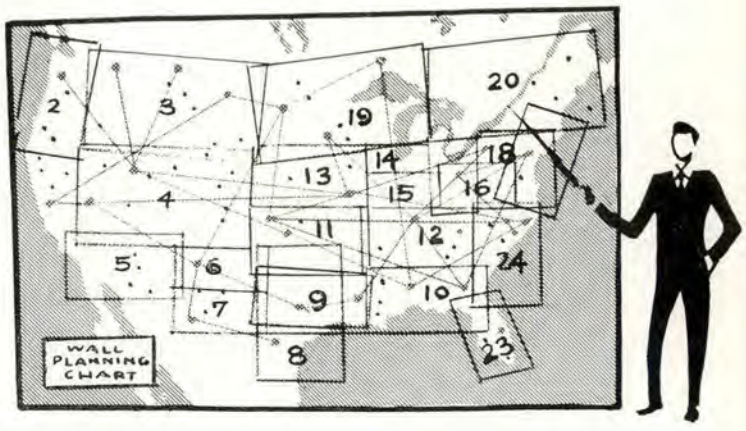
The index of aeronautical information gives you the location of each and every piece of information in the FLIP program. A Special Notices section includes all those notices of a more or less permanent nature which are strictly planning or informational, and can not properly be considered a part of any other section.

An Aerodrome Facility Directory gives information on all those airfields on which the military have landing rights, but which are not shown in the En Route Supplement.

Please note the complete listing of airspace reservations. A lot of you have written letters saying, "We need more information on airspace reservations. Where is it?" Well, here it is.

A new item, too, is the chart showing SAC low level routes which is a fold-in sheet at the end of Section I.

Section II, Planning FLIP. Once upon a time, Air Traffic Control Procedures within the Continental United States didn't change to an appreciable degree from one issue of the Supplementary Flight Information Document to the next. But, a lot of changes have been made in the last few years. A few are: Continental Control Area—high altitude



route structure, Positive Control Airways, and Military Climb Corridors.

Section II presents, in one location, complete information regarding air traffic control procedures. Also shown in this section are the ADIZ procedure chart and the mountainous area chart.

Section III, Planning FLIP. The term "International Rules and Procedures" means, as you might surmise without undue pressure on the old bean, those rules and procedures which might be used anywhere or everywhere in the world of flying. This is one section of the Planning FLIP which we believe is okay to carry in aircraft flying outside the ZI.

Section IV, Planning FLIP. This section didn't take up much space when distributed, because, in addition to the divider card, it was just a single sheet. It contained a list of Regs we believed you'd be most interested in consulting and which it was anticipated would be inserted by your unit operations personnel.

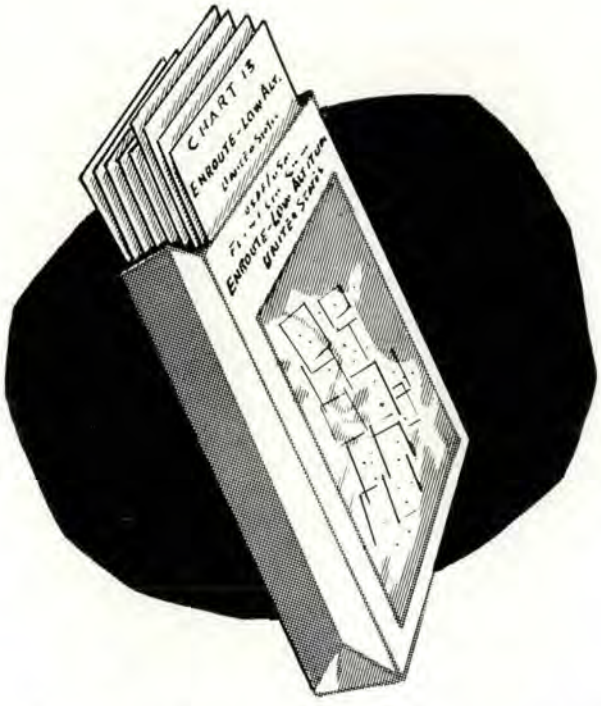
Temporary Addendum of Miscellaneous Data. There seems to be a deep, dark suspicion that some of the information contained in the SFID has been lost, misplaced or disregarded. It isn't necessarily so. To make sure that this didn't happen, the Temporary Addendum was published and distributed as a part of the Planning FLIP. It included all of that information for which no definite plans had been made.

Comments from major air commands indicate a requirement for continuance of some items; others have received no support. Final decisions will be announced in a future revision to the Planning FLIP.

Foreign Clearance Guide. "Foreign Clearance Guide? I've never heard of it!" is a statement we have heard but there has to be one on every base. Comes the time for rotation overseas, someone will have to look at the publication. If you are assigned to a MATS crew, special mission group or ferrying crew, a peek inside this big blue binder should be a routine thing. Do you need passports and visas? Have you, as an aircraft commander, obtained the necessary clearance to fly into a country? These are some of the questions the Guide will answer for you.

Revised pages are issued twice a month and teletype message corrections more frequently.

En route—Low Altitude. A complete new package was issued in January 1959. Twenty-four charts (12 sheets) varying in scale and with LF/MF and VOR data com-



bined to aid in split clearances. The chart legend may be entirely familiar to you by this time, but don't overlook the fact that there have been some changes made.

The low altitude airways planning chart does not, as many of you have noted, show all the airways. On a sheet this size it would be a miracle if you could show all the airways in the United States. Major airways and all active military aerodromes are shown; also the sheetline layout of the en route charts. The en route low altitude arrival chart—successor to the blow-ups shown in the RFC—are of such scale that you can read all the details in congested areas.

All charts are accordion folded to a size of 4 x 10 inches to eliminate the "flip a page, where-do-we-go-from-here" approach required with the book type RFC. (NOTE: An article in FLYING SAFETY Magazine, March 1959, covered in detail the handling characteristics.)

The En Route Supplement is intended to be use with the high altitude as well as the low altitude charts. On the front cover is a thumb-indexed table of contents. Now, let's see, where is Oshkosh? Thumb to O and flip to Oshkosh.

One of the most important items is the aerodrome facility listing which sets forth alphabetically a comprehensive listing of navigational aids and the aerodromes shown on the chart with hard surface runways of 3000 feet or more which are available to military aircraft. Other items of interest found therein: channelization listing; racon and radar listings; emergency procedures, CIRVIS reports, Radar Advisory Service, ADIZ; special notices (the new and important ones).

Regrettably, containers were not available at the time of issuance of the En route FLIP but should be soon.

How often can you expect to get the new low altitude package? For the U. S. area, once every four weeks. We try to get these charts to you on the effective date of airway changes which are normally four weeks apart.

You may find a complete set of charts in your aircraft, or they may be issued in base operations. You may only get a couple of charts if you aren't going far. We have now the selective distribution concept which in this case means "You don't necessarily need the West Coast chart if you're flying on the East Coast."

En Route—High Altitude. This FLIP is, of course, the old High Altitude Facility Chart brought up to date with a new bonnet. The name has been changed and the color scheme is now the black and green used in the En Route—Low Altitude FLIP. Recent changes include positive control airways, radar flight advisory areas, and special notices on new Flight Level altimeter setting procedures above 24,000 feet. Plans are under way to make more changes: the new symbols for LF ranges, Omni's and TACAN's will be applied, airfield symbols will be replaced with airfield patterns, availability of jet instrument approach procedures will be indicated and length and elevation of the longest runway will be shown.

Terminal—Low Altitude. The Terminal Low Altitude FLIP has shown practically no evidence of a face lift to date, at least not since the conversion of charts to midget size several years ago. Revisions are still issued with monotonous frequency because of the many changes in procedures. It is still necessary that you check your publication to make sure the procedures you need are in your book, ready and waiting to be used.

An attempt is being made to schedule the effective dates of instrument approach procedures on a regular basis in the United States so that revisions will be coming out only twice a month.

The ACIC is also investigating the possibility of issuing a bound Low Altitude publication to do away with the two bugaboos of excessive maintenance and missing charts. One problem to be hurdled is that procedures are revised or established so as to become effective at any old time. So there would still be the problem of new procedures arriving any day of the week which would nullify any advantage of a bound volume.

Also, the present number of low altitude procedures in the United States would require seven bound volumes to hold them, with the addition of TACAN procedures, probably nine or ten.

Terminal—High Altitude. The Terminal High Altitude publication, with three saddle-stitched volumes covering the United States, East, Central and West, bears the new title Flight Information Publication Terminal—High Altitude and is issued once every month. We understand it is quite a popular little article. There have been several difficulties or mishaps, for example, in the first issue, the center pages of many of the books had a very annoying habit of coming loose from the staples. It is believed that these have been satisfactorily corrected.

In the recently developed terminal area chart, the area of coverage has been expanded to show the en route or feeder facilities which ATC will use to get you from the high altitude structure to your penetration facility.

Many more new terminal area charts will become a part of the high altitude terminal publication within the next month or so, as base commanders submit approved procedures for publication.

It is hoped this rundown will answer your questions about FLIP and that you will become real "FLIP Tigers." In the meantime, ACIC will be tuning up on further improvement of flight information products and will also be completing an overhaul of the overseas items. ▲

FLYING A'S

For almost seven years the University of Southern California has been conducting classes in aviation safety to train the Flying Safety Officers of the Air Force. The safety course includes study in five major subject areas: aeronautical engineering, aviation psychology, aviation physiology, aircraft accident investigation, and aircraft accident prevention. According to Dr. Louis Kaplan, director of the course, the core of the program is the accident investigation and prevention phase.

In addition to the five major subject areas, the FSOs are given a course in educational principles and methods. This course enables the trained FSO to pass on his hard won knowledge to others. And the knowledge is certainly "hard won!" The eight weeks course now comprises 260 hours of instruction and for most of the students, as they themselves will testify, the course is rough. For most of them homework was a chore of the past, remembered fondly and somewhat inaccurately as something they were swamped with in high school or college. At USC, the answer to successful completion of the course is homework, more homework and then still more.

Those students who successfully pass the final exams can well take pride in their accomplishment. But there are those few who excel. There are some who finish the course with a straight A average. It is these few we want to recognize here for their devotion to duty which enables them to come out on top in this difficult program of study. Here is a list of those graduates of Class 32 who came up with straight A. FLYING SAFETY Magazine intends similarly to recognize those officers who can match this mark in future classes. Congratulations. ▲

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Maj. Robert J. Borchardt, 90th Strat Recon Wg, Forbes AFB, Kan.

•

Maj. Donald L. Herman, 460th FIS, Portland Int'l Airport, Ore.

•

Capt. Edward K. Goethe, Jr., 15th FIS, Davis-Monthan AFB, Ariz.

•

Capt. Delmar S. Hilliard, 412th Ftr Gp, Wurtsmith AFB, Mich.

•

Capt. Arthur J. Porter, 144th AD Wg, Calif. ANG, Fresno, Calif.

The aging B-57 is still with us and the Air National Guard will be the prime user in the months to come. The pilots who fly the Canberra will do well to remember that no matter how new or old the airplane is, flying by the rules is still. . . .

The Name of

In these days of razor-wing, supersonic aircraft, the aging B-57 is a comparatively safe, easy plane to fly. In fact, it is deceptively easy to fly and is extremely forgiving of most pilot errors. And this, in the opinion of many, has contributed to a large number of accidents.

It is hard to find another reason why numerous pilots—some with thousands of flying hours—have ignored or quickly forgotten the cardinal "do's" and "don'ts" which are printed in the flight handbook and in the booklet "B-57 Piloting Techniques," published by The Martin Fight Test Department. Yet, these rules are still being ignored, with fatal results in many cases, for the B-57—like an aging boxer with years of experience—still demands professional respect.

There are two cardinal rules more important than all others because accident records indicate that pilots have forgotten or ignored them more than the rest. Since these two rules are the result of the B-57's minimum single-engine control speed, a complete understanding of this term is necessary to appreciate the rules.

The single-engine minimum control speed of any airplane is defined as the slowest speed at which the pilot can apply full power to the operating engine and still maintain directional control, without banking more than five degrees.

On B-57A, B and C models without a power rudder the average pilot *cannot* apply enough rudder pedal force continuously to counteract the thrust of full power from the operating engine if the airspeed is below 155 knots. Thus, 155 knots is the minimum single-engine control speed of all B-57's without boosted rudder, and one of the two most important cardinal rules is formulated.

Never get slower than 155 knots when operating on one engine except when on final approach and the landing is assured.

This rule should be followed even when practicing single-engine operation at the highest altitude as specified by directives. In simulating single-engine operation, remember that thrust decreases with altitude. This means that if a pilot can hold a given airspeed at 10,000 feet, he will *not* be able to control the same airplane at this speed at 1000 feet. It is a good idea to determine what you can hold so that you will know your own as well as the airplane's limitations.

One other item concerning single-engine practice: do not shut down one engine. Such advice may seem completely unnecessary, even insulting, to most pilots, but two fatalities have already resulted from this. The safest technique is to retard both throttles to idle and slow the airplane to about 165 knots. Then gradually add full power on one engine, holding heading without the benefit of trim and slow the airplane gradually until a minimum airspeed of 155 knots is reached. There is no need to get slower, even if you can hold the minimum single-engine control speed without undue strain. And never shove the throttle full forward abruptly under any circumstances.

After you have a feel for flying in this condition, begin the practice routine again with gear and flaps down. As the minimum single-engine control speed of 155 knots is approached, you will note that with full power of the operating engine, the airplane will not maintain altitude. This demonstrates the second of the two most important rules, violations of which have contributed to a number of major accidents.

Never attempt to go around on single-engine with gear and flaps extended, if airspeed is below 155 knots and altitude less than 500 feet.

There are no exceptions to this rule. If on a single-engine approach and you get below airspeed-altitude minimums, there is only one thing to do: *Land!*

Should you anticipate being short of the runway, gradually add as much power as you can hold and set the airplane down where you must. If you expect to land long, cut the power, increase the glide speed and land at a higher than normal touchdown speed on at least the first third of the runway. Once on the runway, lower the nose immediately and get on the brakes.

Either of these predicaments can be avoided by following the single-engine procedure given in the Dash-One. This specifies keeping the flaps retracted until you're set

the Game!

Martin Flight Test Department, Martin Co., Baltimore.

up on final and assured, as much as you can be, that your approach is right.

If ever in a situation where a go-around is permissible, keep the nose down to hold speed and apply power smoothly so that directional control is maintained. Retract the flaps, then the landing gear.

So far, the discussion of single-engine operation has been on B-57s equipped with a manual rudder. For airplanes with a power rudder, such as the E model, the two cardinal rules apply—except that 120 knots is the speed figure with the boost *on* and 160 knots when it is inoperable. The reason that the E minimum single-engine control speed with boost *off* is five knots higher than on non-boosted models is because of differences in the rudder tab. The lagging tab on the E rudder is not as effective as the spring tab on other models. Installation of the power rudder necessitated the change in the E tab design.

Both during practice and under actual single-engine conditions, care should be exercised when advancing the throttle of the operating engine. The J-65, like most jet engines, develops most of its thrust during acceleration in a rapid surge in the last few per cent of RPM. This surge of power creates a dynamic yawing condition that is difficult to control. If power is applied rapidly on a single-engine at 155 knots, this dynamic yaw produces a situation that can easily result in loss of control under operating conditions. Even at speeds slightly in excess of 155 knots this will result in a condition requiring the finest of piloting skill. Therefore, we come to another rule which many of you may not have seen stated in exactly the same manner:

When on single-engine, always apply power slowly, especially at speeds below 200 knots.

This rule is almost as important as observing the basic 155-knot injunction. Regardless of how tight the situation may be, when you are on single engine below 200 knots, use your good throttle with caution. Remember that holding a minimum control speed under stable conditions and being confronted with it under a dynamic operating condition can be two entirely different problems.

While on the subject of landings there is another caution that is so basic it is embarrassing to put on paper. Always remember that when wing flaps are extended, the airspeed will bleed off rapidly unless you work at controlling it. This item ties in with the aforementioned rules and certainly needs no further explanation.

Another important cardinal rule is the result of the effect of fuel consumption on center of gravity travel. When fully loaded, the CG of the B-57 is very close to the aft allowable limit. Burning fuel from the No. 1 tank and the tiptanks moves the CG farther aft. Using fuel from the No. 2 tank moves the CG forward, while burning from the wing tanks has a negligible effect on CG travel; so remember the following rule:

Never allow fuel in the No. 1 tank to decrease any appreciable amount while the tips and No. 2 tanks are full.

The low-level warning light for the No. 1 tank was incorporated to warn the pilot that the other tanks are not feeding, but it is good practice to check the quantity gages to insure that No. 2 tank is emptying. Failure to follow the cardinal rules of fuel management procedure prescribed in the Dash-One has contributed appreciably to the B-57's accident rate. The Handbook, incidentally, contains a detailed description of flight characteristics when the CG is beyond the aft limit, so there is no need to repeat the information here. A thorough knowledge of these characteristics is a must, however, for all B-57 pilots.

The next cardinal rule is more of a general flight safety regulation, rather than one applicable only to the B-57, but it must be mentioned here because disregarding it has resulted in several major accidents, fortunately none of them fatal.

Initiate gear retraction only after definitely airborne and when airspeed is at least 15 knots above normal takeoff speed.

In keeping with this rule, it is a good habit to compute the takeoff performance before every flight. Admittedly, the B-57 has excellent takeoff performance compared to most jet aircraft, but high gross weights, field elevations and temperatures extend takeoff distances and speeds considerably, and only the charts will tell you exactly how much. In addition, these charts provide the best speed for nosewheel lift-off. This should be used for every takeoff because assuming a premature nose-high attitude is dangerous piloting technique. It makes directional control unnecessarily difficult and increases drag, which lengthens takeoff distance considerably.

Before leaving this subject, one other cardinal rule for takeoffs must be cited.

Allow the airplane to accelerate to minimum single-engine control speed as rapidly as possible after lift-off.

Such takeoffs, while not spectacular, demonstrate good, safe, smart piloting technique. Professionalism is the word currently used. Pilots of E models should use the minimum single-engine control speed for boost off (160 knots) to be doubly safe.

Takeoffs made immediately after full-stop landings introduce another cardinal rule which B-57 pilots must remember.

When shooting full-stop landings, allow a 10-minute brake cooling interval between landings if gear is left down; if gear is retracted, make landings at least 30 minutes apart.

Violation of this rule has added to the accident rate because retraction of the gear when the brakes are overheated has caused inflight fires.

When using brakes on landings with gross weights below 38,000 pounds, exercise care to prevent the tires from skidding. Braking capacity on landings above 40,000 pounds is noticeably less than at low gross weights. Keep this in mind when making heavyweight landings, particularly if the majority of the landings have been with low gross weights.

Ascertaining the correct touchdown and over-the-fence speeds for each landing, emergency or otherwise, is something every B-57 pilot should do. But because maintaining exact speeds during the approach is not as critical with the B-57 as with many other current airplanes, some B-57 pilots become lax. This type of pilot is failing to establish a habit pattern which can make dealing with emergency or unusual landings easier. (For example, landing with asymmetric tiptank loading or at high gross weight.)

The importance of good habits in flying any airplane is well known; in fact, it's the basis of military flight training. What some B-57 pilots may not realize, however, is that habit is the only way a pilot can avoid violating the cardinal rule regarding speed limitations.

Never exceed the red-line speed for the airplane's configuration.

Only by developing the habit of closely monitoring the airspeed indicator can a pilot adhere to this rule when flying at high speeds at low altitudes. Up to 5000 feet, there is no buffet or unusual characteristic to warn the pilot that he is approaching the speed limit—500 knots without tiptanks and 444 knots with tips. In the latter configuration, the pilot must be doubly cautious because the placard speed can easily be exceeded with the thrust available. Above 5000 feet in either configuration, buffet, tuck or wing drop will usually warn the pilot that he is approaching the speed limit.

In some cases the limit can be exceeded slightly without undue danger but this should not knowingly be done. With tiptanks, the placard speed is close to the structural limit. Exceeding this speed will damage the ailerons and possibly other parts of the airplane.

The red-line speed without tips, although usually accompanied by aerodynamic warning, is close to the area where a pitch-up will develop. If this area is entered with any appreciable acceleration, the pitch-up will generally throw the airplane into a high speed stall. Needless to say, this area should be avoided. In fact, when flying near the red-line speed, be especially observant of the basic flight characteristics. If any of the aerodynamic warnings are present, do not increase the speed, even if the Mach-meter indicates that the limit speed has not yet been reached. Below 5000 feet, monitor the airspeed indicator closely because, to repeat, no aerodynamic warning will occur.

Adherence to this rule applies to many other of today's jet airplanes as well as the B-57. The same is true of the cardinal rule regarding aerobatics, but some pilots have violated it, either because of carelessness or ignorance.

When doing a loop or Immelman, do not hold constant acceleration — by reference to accelerometer or by the seat of the pants—from start to completion.

Failure to follow this rule usually results in a stall at or near the top, followed by a spin. The correct technique is to ease up slightly on the column on reaching the vertical position or beyond and to have an over-the-top acceleration 1G less than that initially established. If the stall warning should occur, immediately ease off the pressure, using a rapid control motion only when the stall is fully developed.

The last of the cardinal rules has been violated several times, but fortunately no fatalities or serious accidents resulted. Nonetheless, a major accident could occur to the next pilot who breaks the following rule.

If hydraulic failure is suspected, do not depress brake pedals until after landing, then gradually and steadily until stopped.

This rule is cited many times in the Flight Handbook as are all others discussed in this article. Countless others in the manual have not been mentioned here because, although equally important, they have not contributed materially to the accident rate. As far as is known, no pilot has been involved in a major accident because he failed to follow the rules regarding intentional spins, speed limits for gear retraction and numerous other rules. It should be unnecessary to state that all of these must be known and followed by those who fly the aging B-57 because it is still a potent airplane. ▲

TAC TAKES DAEDALIAN

The year 1958 will be remembered for many things but to officers and men of the Tactical Air Command, it probably will best be remembered for what international tacticians refer to as brush fire conflicts or small scale wars, two of them to be exact—Lebanon and Quemoy.

On April 11 at Kelly Air Force Base, TAC had another reason to recall 1958 as Maj. Gen. Carl Truesdell, Jr., representing General O. P. Weyland, TAC Commander, stepped before a crowd of some 200 active and retired U. S. military officer-pilots to accept a huge, gleaming silver cup, the Daedalian Trophy, the highest flying safety award any U. S. Air Force command can receive. Of 12 commands logging 100,000 or more flying hours during 1958, TAC was considered to have achieved the most effective accident prevention program. They made this record the hard way while succesfully completing hundreds of trans-ocean flights in single-engine jet fighters, and while taking over the operation of three jet trainer bases. More important, TAC did the job it was designed to do when it helped snuff out a couple of would-be world wars before they had time to erupt.

Awarded this year for the 25th time by the Order of Daedlians, the coveted Daedalian Trophy was presented to Gen. Truesdell by Lt. Gen. D. C. Strother, Air Force Deputy Chief of Staff of Operations, on behalf of Gen. Thomas D. White, Chief of Staff. Last year, it was won by the Continental Air Command for scoring the safest accident tally in 1957.

In addition to the large silver cup which rotates perpetually between winning commands, TAC received a handsome bronze plaque for permanent possession. Both awards were viewed by tens of thousands at the Directorate of Flight Safety Research display at the World Congress of Flight in Las Vegas, Nev., then were turned back to TAC for exhibition at Langley AFB, TAC headquarters.

Selected for the honor by Gen. White on recommendation of The Inspector General and the DFSR at Norton Air Force Base, California, where all nominations were analyzed and scored, TAC slashed its accident record from 25 majors per 100,000 flying hours in 1957 to 16.9 in 1958. A reduction of 32 per cent, it was even more notable since TAC flew approximately 250,000 more hours in 1958 and had 23 fewer accidents.

Just what did TAC do to win the marbles for fly-safe in '58? The smiling two-star general summarized his answer for the attentive Daedalians, thusly:

"The key to our reduction was the placement of more emphasis on supervision, some good hard work, and a serious application of all known flying safety procedures."

Operationally, 1958 was a tough year for TAC to reduce its accident rate. It established a new organization, an aircraft delivery group, to assume the MATS delivery function. Nearly 600 aircraft, mostly single-engine jet fighters, were ferried across the Atlantic and Pacific Oceans, into South America, Alaska, and to various island bases.

TAC took over Luke, Williams and Nellis training bases with the reasonably hazardous mission of checking out basic flying school graduates in high performance single-engine aircraft. In addition, it conducted a program for student pilots from Allied Nations despite a barrier of mixed languages.

Gen. Truesdell told delegates to the National Convention at Kelly that during 1958 TAC also rotated nine complete tactical fighter squadrons in and out of Europe as part of its normal training program. Nearly all of these flights were non-stop with TAC doing its own in-flight refueling from KB-50Js. Then there was a goodwill flight of B-57s to South America and a deployment of F-100s to Norway and Denmark.

"Probably most critical and important operationally," he related, *"was our deployment of two composite air strike forces under emergency conditions into the Middle East and Far East. We feel strongly that our strike force at Adana, Turkey, and the other at Taiwan (Formosa), Clark Field in the Philippines, and Okinawa, were the most important single factor in deterring small wars in both areas."*

As he accepted the No. 1 flight safety award from Gen. Strothers, Gen. Truesdell proudly exclaimed that TAC doesn't intend to give up the Daedalian Trophy in 1959; that TAC already is conducting an accident prevention program designed to reduce the command's accident rate considerably below 1958's highly commendable figure of 16.9.

There are 15 other major commands in the U. S. Air Force (and their commanders) who unselfishly wish TAC well in its continued drive to cut accidents in '59, but, confidentially, these same 15 commands (and definitely their commanders) are privately saying the Daedalian Trophy will have a new home next year. It seems that each has set up a flight safety goal "that can't help but win."

Perhaps the Order of Daedalians will need 16 cups for the 1960 Convention! ▲

**History of the Daedalian Trophy was published in the June 1958 issue of* FLYING SAFETY, *Pages 16-17.*

Hurry Up and Have an Accident

Captain Walter R. Miller, 118th Tactical Fighter Squadron, Connecticut ANG.

"If at first you don't succeed, try, try again." This seems to be the motto of the hordes of pilots who are rushing about constantly trying to hurry themselves into an accident. Look at 'em go, like ants scurrying to a picnic! Rush! Rush! Rush!

Race to the flight line, you're late for a scheduled hop. Skid into a parking space, run to ops and dash off a clearance. Snatch up your chute and out onto the line. Slow down? Not on your life. A fast run-around the bird, catapult into the cockpit and . . . zoom!

Crew chiefs make a dash for cover as the tail blast of our disappearing ramp scamp blows canopy covers, chocks and unsuspecting airmen into the next county.

"Towerthisisquickieflightrolling"—He's off and everyone's grateful for small favors. The base is still intact and nobody's hurt. Maybe now we can settle down to the more mundane, everyday routine — but no, "MAYDAY!" "MAYDAY!" These terrifying words electrify the tower operators into action.

Instantly the alarm is sounded and the entire base is alerted to a possible disaster.

"Mayday! Tower, this is quickie flight . . . flameout . . . can't get a light, will try for a straight-in."

This is serious. Crash crews run for their trucks, and the Medics, Chaplains, CO's and Photographers all drop what they're doing and speed to the runway.

By the time they get there, it's all over. He landed okay and no one was hurt. No one, that is unless you want to count the fireman who fell off the crash truck as it careened around a corner and was run over by the ambulance that was following too closely. Plus the rather shaken and bruised crew of the second crash truck that rolled over as it swerved to avoid the ambulance! Mack Sennett couldn't have staged a better comedy except that these things actually happened. They were not invented by a Hollywood gag man.

Our hero, as you may have guessed, neglected to check his fuel before climbing aboard. You've probably formed a mental picture of this hasty character. This guy's bound to be a bright-eyed, bushy-tailed brand new second balloon, with lightning bolts in his pants! You think so? Well, let's set the record straight. This particular pilot is a Major with 14 years of service. He's a senior pilot with green card, 3000 hours of accident-free flying and a highly respected ops officer! He just happened to be the victim of the No. 1 scourge of flying safety officers: H-A-S-T-E !

Unwarranted hurrying or haste can usually be found as a cause factor in nearly every accident, if you'll dig far enough. Yes, even materiel failure can be caused by hasty engineering or testing.

Is this single element of human nature so powerful that it can goad experienced, sensible pilots, crewmen and others into risking their lives for the sake of a few miserable minutes? If so, perhaps we should examine it with the thoroughness of a research scientist seeking a cancer cure. The successful elimination of haste from our daily routines would probably benefit mankind much more than a cure for this dreaded ailment but I'll bet my next 10 years' pay that cancer will be a forgotten malady before people stop hurrying to their graves. Why? Because the pain of cancer and its horrifying consequences are so obvious a threat to everyone, whereas the trend to do things faster and cram more and more activities into each day is becoming a national creed. We virtually get up in the morning, shouting to the hilltops, "Let's hurry up and have an accident."

Now before you classify me as a heretic out to impede progress, let me explain that I'm not campaigning for a return to the horse 'n buggy days.

I am campaigning for the elimination of haste, not speed. Webster makes very little distinction between these two words. So, for the sake of clarity in this article, let's define *speed* as a swift movement, action or happening, and *haste* as that attitude which causes a person to overlook, eliminate or bypass safe, established procedures in the conscious or subconscious attempt to save time.

The examination of a few typical incidents may help us to understand why we allow ourselves to be tricked by the villain, Demon Haste.

Take the case of the ADC pilot who tried to scramble so quickly that his crew chief did not have time to disconnect the auxiliary power unit (APU). This produced a very funny sight—dragging his put-put behind him—but someone could have been hurt and it did damage the receptacle and power unit. In fact both the aircraft and the APU were out of service for a spell. Now this officer was not an irresponsible lout. He was a serious pilot, striving honestly to get his bird into the air and do his job as quickly as possible. The fact that he mistook haste for the genuine article — speed — is cause for our concern and is, in fact, the basis of this entire effort.

Recently the pilots in my squadron got a chuckle when word leaked out that a group-type goofed and gave himself a mild case of hypoxia while checking out in an F-100. I suppose we all get a small sadistic thrill out of hearing that the top dogs aren't always infallible—makes us feel smug 'n superior to the superiors. Fact of the matter though, he's a fairly popular guy as headquarters types go, and all of us would have been real sad had the incident progressed past the hairy tale stage.

The situation leading up to it was commonplace and the incident easily preventable. He had a ruptured diaphragm in his oxygen regulator and ordinarily would have spotted it during a simple P.D.McCripe, had he taken a few seconds to run through this old familiar check. However, this was his first formation flight after the initial transition rides. He was

still a bit unfamiliar with the aircraft so he took a little longer than the others to complete the preflight. In his haste and with pride pulling him along, he snubbed his old, old friend, the oxygen check, so that the others wouldn't be kept waiting. (Can't have anyone thinking the Old Man is slowing down.) Unfortunately, as is so often the case, whenever you treat old friends with contempt, the viciousness with which they strike back is frightening. Fortunately, however, for our Colonel, years of training stood him in good stead and when he realized he was in trouble, instinctively pulled the release on his bailout bottle and snapped out of it.

These hairy tales will be good for a few laughs at the bar for awhile, but we don't laugh about our old friend who was in such a hurry to make a flight that he cleared into an area of heavy icing over the western mountains with an aircraft devoid of any anti- or de-icing equipment!

Nor do we laugh about another old squadron mate who just *had* to land as soon as he reached the field even though there was a heavy rain shower in progress. He skidded off the end of the runway into a shallow bay, flipped over and was drowned. Ten minutes later the shower was over and the aircraft was found to have over two hours of fuel remaining.

And can you possibly imagine a group of mechanics in such a hurry that they would stand under an F-84 tiptank, willing to catch it when their chief released it from the cockpit, without checking to see if it was empty? They did, and it wasn't. Three good men in the hospital and 1500 pounds of JP-4 spilled in the cause of haste.

I can fill a book and I'm sure you can fill 10 more, just relating accidents or near-misses either directly or indirectly caused by someone hurrying beyond his capacity. Sure we can dismiss them as bird-brained acts committed by idiots, except that we can probably remember more dangerous incidents caused by our own hurrying than by others. Will you admit to the bird-brained classification? I won't! Now if we are forced to admit that a great majority of these incidents are caused by normally sane persons, then we are obligated to expose the cause and do everything possible to stamp it out.

Let's take a look at a few of our occupational danger signs. Have you ever checked out in an aircraft by leafing through the Dash-One to find the answers to the questionnaire, then never referred to the manual again because you didn't have time?

Or, quicker still, copy the answers from someone else's questionnaire? How about preflights? Ever just ask the crew chief and not bother to kick the tires? Or not even check the form? What about the time the weather was 200 and 1/2 and after waiting over an hour for a clearance, the tower said you were clear to go—if you would take it on the roll—otherwise hold, because an inbound was just about at the outer marker. . . . and you held, huh?

If you are in multi-engine, do you always insist that the copilot read the checklist while you accomplish it, then have him double check you? Or, have you zipped around the cockpit like a squirrel, doing it all yourself while the copilot was busy with his other duties?

How many times during the past year have you taken the time to sit in a cockpit and drill yourself on emergency procedures? Do you always take time after every flight to ask for a GCA, ILS or SFO? Have you ever cranked up and felt that the flight commander was pushing you faster than you could hack it? These are only a very few symptoms and yet I imagine you will qualify for the Liars Club if you don't admit to being guilty of a couple of these at one time or another.

We can help ourselves to stay alive if we learn to recognize all the danger signs and then take definite action to resist that great temptation to hurry. We can take time to learn and practice sound procedures so that in an emergency we will instinctively do the right thing in the fastest possible time and not be forced to try dangerous short cuts.

During the Korean War, a group of all-weather fighter crews experimented with the procedures of scrambling an F-94B. The startling noise of the scramble bell in the middle of the night, plus the yelling and running of the ground crews and aircrews, all added up to a terrifying atmosphere, and confusion reigned supreme. In fact I remember one night when a pilot started taxiing out while his RO was still only halfway in the cockpit.

Soon they saw the errors resulting from just plain rushing around and started to plan every move. Equipment was placed in strategic locations and the ground crews drilled themselves on starting APUs and helping the air crews strap in. In almost less time than it takes to write this, everyone was so well organized that no movie director in his right mind would ever use this outfit for a scramble scene in a movie. Everyone moved so precisely that no one seemed to be rushing needlessly or excitedly. After they'd taken the time to train, to my knowledge, no one ever missed a five-minute takeoff.

As supervisors, you can be that previously mentioned research scientist and objectively probe into all areas that might cause dangerous hurrying.

Do you allow enough time for ground training, maintenance and preflights? You must insist on constant, well-planned, emergency drills and allow time for quality in every phase of operation. Try never to be guilty of applying pressure to your less-experienced crews so that they feel they must hurry in order to comply. Give them enough time to complete a thorough briefing and preflight. Gone are the days of "First one off is the flight leader."

Recently, a state official was cited both nationally and internationally for his aggressive program of highway safety, aimed especially at curbing fast driving. As a small part of this program he insisted that all official state mail bear the slogan, "Slow Down and Live." This was a sound slogan for the most part, but when I received a letter with this slogan under the letterhead of the Department of Aeronautics, I couldn't help being amused. The next time I saw the head of the department, who is a Colonel in the Air National Guard, I just had to rib him about this seeming bad advice to airmen. However, he quickly stopped my glib needling with some sage advice.

"Russ," he said, with a knowing look, "*you* do the slowing down, not the airplane."

Well, my friends, he put it in a nutshell. Let's have our airplanes fast and our preparations slow enough to be thorough. Let's advertise the symptoms and campaign vigorously against hurried carelessness.

The good Colonel started me thinking, and if this article will start you thinking, maybe we will both be alive tomorrow and capable of walking to the flight line. Walk on the sidewalk though or you might be run down by someone who can't read. Someone speeding to his first accident! ▲

Come Home To Mama

Jane Ganter Swanson

Men do not die of being lost. They need not die of exposure. But they do commit suicide through ignorance.

A recent article in FLYING SAFETY pointed out the fact that pilots in ever-increasing numbers fly from East to West and return over some of the wildest, most desolate country in the United States. In calm confidence, they don lightweight flying suits — sometimes wearing only regular low-cut shoes—and pass across miles and miles of uninhabited regions.

"It can't happen to me" is the great American slogan. Any Search and Rescue (SAR) coordinator in the Air Force can tell you it does happen. Civilian rescue teams who have climbed, sloshed and plodded to the scene of aircraft accidents will tell you it does happen.

Unhappily, these search and rescue teams too often return with the tarpaulin-wrapped bodies of men who did not practice the basic fundamentals of survival.

Repeated references to the inevitability of death by astonished survivors of bailouts in remote regions is downright sickening. Death is not inevitable. A man can live for several weeks without food. He can live for a couple of days without water. It may not be comfortable, but it's living. With a pint of water a day, under certain circumstances, a man can get along indefinitely as long as he does not exert himself too much and work up a sweat.

Most pilots recognize the need for some sort of survival knowledge. Few ever get around to practicing it. When asked if he carries matches, for example, the typical pilot may reply—smugly patting a pocket—"Sure, I always have a pack of matches." A paper book of matches is about as useful for fire-building as a sponge if he bails out in rain or snow, or lands in a creek.

The basic equipment for survival—indefinitely—is so simple. The most important piece of equipment is always with you. It is your *brain.* Use it. Think.

Two completely opposite points of view are apparent in any study of case histories. Those waiting at home refuse to give up hope until they have positive proof of death. Those faced with survival in rough terrain sometimes give up hope before their parachutes are fully open.

Morale, hope, faith, God—whatever you choose to call it—is of primary importance. Experienced rescue teams

know the value of morale and often resort to ridiculous songs or stories to keep flagging spirits up during the course of a long, disappointing search mission.

Remember, ". . . those who are searching for you have a better chance to do the job than you will have searching for them." (Quoted from "Can You Handle an Emergency?" published by the Mountain Rescue Council, 1953.)

Too frequently the first thought a man has after unharnessing his parachute is, I must get help. The proper attitude is, I must stay alive and well *'til help reaches me*. As soon as a plane is overdue or reports difficulty, Flight Service and ARTC conduct ramp and communications searches. When this indicates that the plane is missing, Search and Rescue is alerted. Someone is looking for you. Stay where they can find you. Use the remaining hours of daylight, if any, to set up a camp. If it is dark, set up a camp anyway. You will certainly be glad you had the foresight to carry those waterproof matches.

A striking misconception often voiced is, "If I had stopped I wouldn't have been able to start again." Or, "If I had stopped, I would have died." Nothing could be further from the truth. Rest. Conserve your energy. Protect yourself from shock. You will undoubtedly be hungry. You may have to look around for water. The more a person wanders about aimlessly, the more he wastes his store of energy. Even more important is the loss of water through perspiration.

Experts in survival recommend a procedure along these lines: if one is injured, he will, of course, tend to his injuries. Shelter is then the first concern. Holing up serves the dual purpose of keeping your mind occupied and your body warm. A variety of shelters and lean-tos can

. . . pilots fly from East to West over some of the wildest country in the U.S.A.

They also survive who only sit and wait.

be constructed from a parachute. The parachute may be used as a sleeping bag and a shelter made of boughs. In snow, a trench or cave may be dug to protect one from the wind and weather. You will *not* freeze to death while sleeping. Getting chilly will wake you up. Sleep often during the time you are awaiting rescue. Besides conserving your body heat and energy, you will require less food and water.

Arrange for signaling to those who are searching. A fire is best. Have a good heat fire going, with green boughs, shrubs or leaves piled nearby to throw on for smoke when search planes are heard. Those water-proof matches are important. It is also important that the fire be burning well before you dump all that damp stuff on top.

Mute evidence of a fire that would not start is often found near the body of a victim. Dead wood that is wet on the outside can often be split (a knife is convenient, but not essential) to reveal dry tinder inside. A fire fed with slivers of this tinder can be built up and will then help to dry other fuel. This may include some kinds of bark or pine cones which are highly combustible. Twigs and dead wood may be found by digging down under the wet or snowy surface.

It has been said that the quickest way to get yourself surrounded is to set a fire in a National Forest. Forest Rangers will appear from nowhere to ask for your permit.

When shelter and a signal fire are taken care of, it is wise to find a source of water. Fortunately, the mountains of the West usually abound in little streams. Snow can be melted or eaten as is. If you choose to eat it, slosh it around in your mouth to warm it up and prevent stomach upset.

Food is the least of your worries. The human body can live off stored fat for a couple of weeks at least. A week without food might even improve your figure.

After you are well settled you may decide to explore the possibilities of getting out of there. A frequent mistake is to just pack up and leave, aimlessly, looking for help. Work from your base camp. Explore systematically. It is usually wise to look for high ground where a wider view is available. The old routine of following the stream to its mouth could take you deeper into nowhere. If a more advantageous campsite is found (for example, near a large clearing that would accommodate a chopper), allow yourself daylight hours to move and set up another camp.

Don't just sit down to die. Don't walk around for the simple reason that "If we're going to die, we'll do it walking." Someone at home is sure you are going to come back alive, and you can.

There might be really lousy weather conditions that prevent search planes from seeing you for a few days. These same weather conditions preclude any very successful efforts at getting out on your own. With all this time on your hands you will want to take advantage of the various recreational facilities at your disposal.

If fishing is your game, ripcord pins can be ground down on a rock to make workable fishhooks. Nylon shroud lines make the line, and you're all set for an afternoon of sport.

On the other hand, you may not care much for fish. But, don't those snowshoe rabbits look delicious? The filaments from the shroud lines can be used to make a snare, such as was used by American Indians for catching game—and the white men. A loop, on the trail where you noticed animal tracks, attached to a bent tree limb will catch your dinner. And aren't you glad you had those waterproof matches in your flight suit? Raw rabbit is not too tasty.

At high altitudes or during extremely cold weather conditions it is possible to get frostbitten lungs or pneumonia from prolonged inhalation of cold air. Mountaineers who conducted experiments in Alaska during WW II found a very simple and effective solution for this. It is called a snorkel. It not only warms the air but also helps to preserve body heat while sleeping. A wool sock makes the best snorkel. Cut out the toe, and fasten the top part of the sock around your nose and mouth, like a bank robber's mask. Breathing through this somewhat revolting device (unless, of course, you had an extra pair of clean sox in your pocket) warms the air considerably and reduces the possibility of freezing your lungs.

All this may sound ridiculous to the pilot who does most of his flying in southern Arizona. Those in the Cascade or Rocky Mountain areas may see some logic. The men who ended up in Hell's Canyon, Utah, were en route from southern Texas. A number of people have found themselves atop Cedar Mountain in Washington State, dressed for Florida weather. Dress in reasonably warm clothes when flying. You won't suffocate.

Wool sox may be worn without discomfort in warm weather. Many athletes wear them all the time for the excellent absorption qualities. Wool sox in a survival situation may save your toes from the surgeon's knife.

A flight jacket—you can always turn off the heater—is comfortable and may save your life if you bail out or crash land.

There is someone looking for you. If the terrain is such that a rescue cannot be completed right away, food, supplies and even doctors can be dropped to you. After all, you probably got there via parachute yourself.

And remember, there is someone very important waiting for you. She will keep on hoping. The least you can do is keep on trying. ▲

AN IMPORTANT CALL?

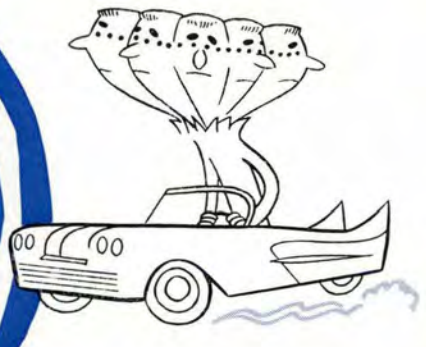
An important call? Of course! Maybe she's making plans for the evening. The details are absorbing. Where to go? What to wear? Who'll be there? Any important producers? This is the proper time to make plans, when there's no hurry and both feet are on the ground. Pilots, make your flight preparations carefully. Who knows? Maybe she'll be phoning you some day. It would be a pity not to be around to take the call.

Start it like an evening
on the town, with a careful check around.

Inspect it like you were
going to buy it for cash with no guarantee.

Taxi it like the tightrope walker. When he puts
his foot down he knows where the wire is.

...IT'S YOUR AIRPLANE



Take it off like you tried to
on your first solo.

Fly it like the first time
you drove that red convertible home.

Land it as if the last box of eggs on
earth were lying loose in the cargo hold.

Shut it down as if the CO and Ops Officer
were waiting to give you the Pilot-of-the-
Month Award.

Write it up as though you
were getting paid ten cents a word.

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