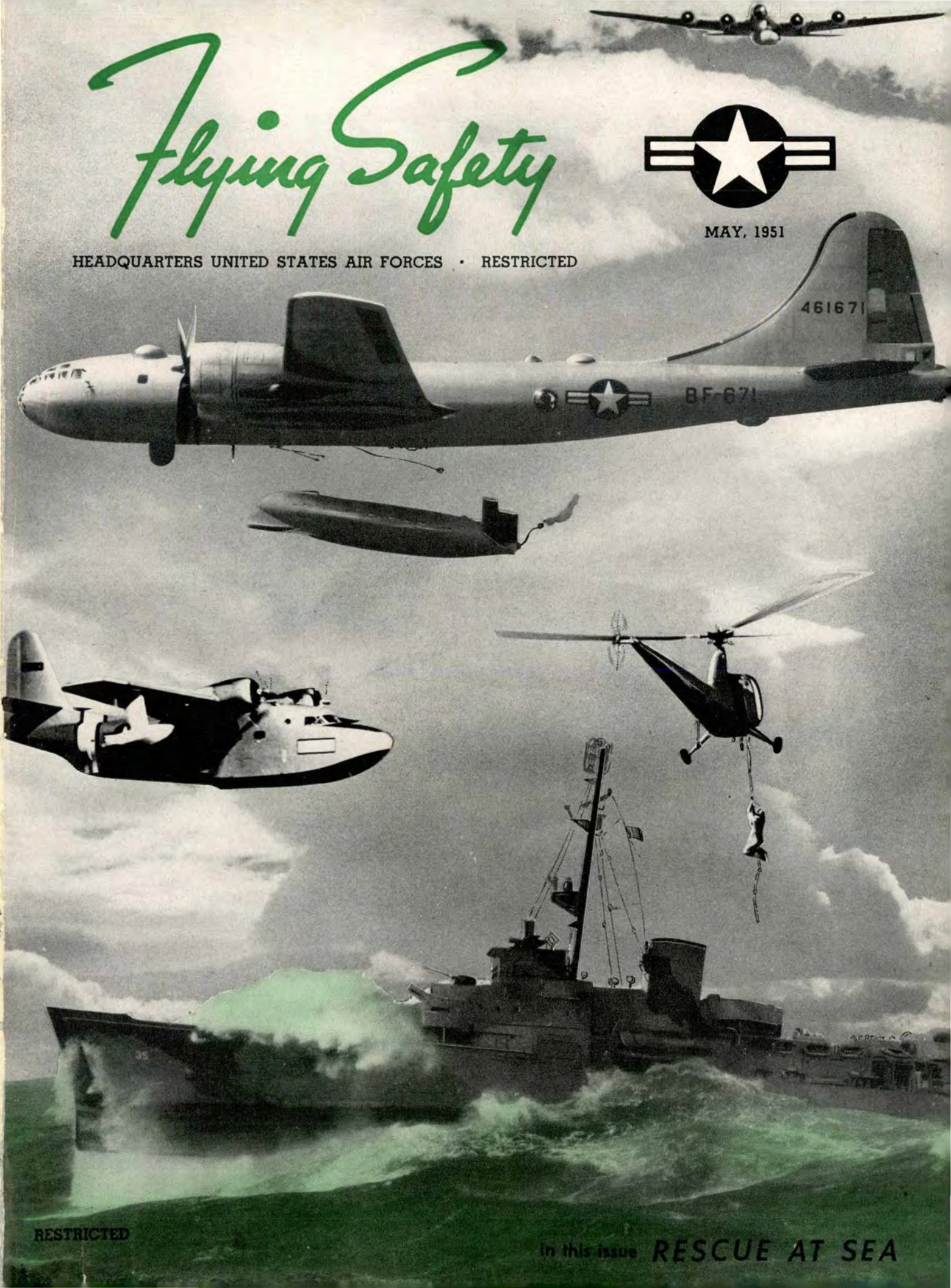


Flying Safety



MAY, 1951

HEADQUARTERS UNITED STATES AIR FORCES • RESTRICTED

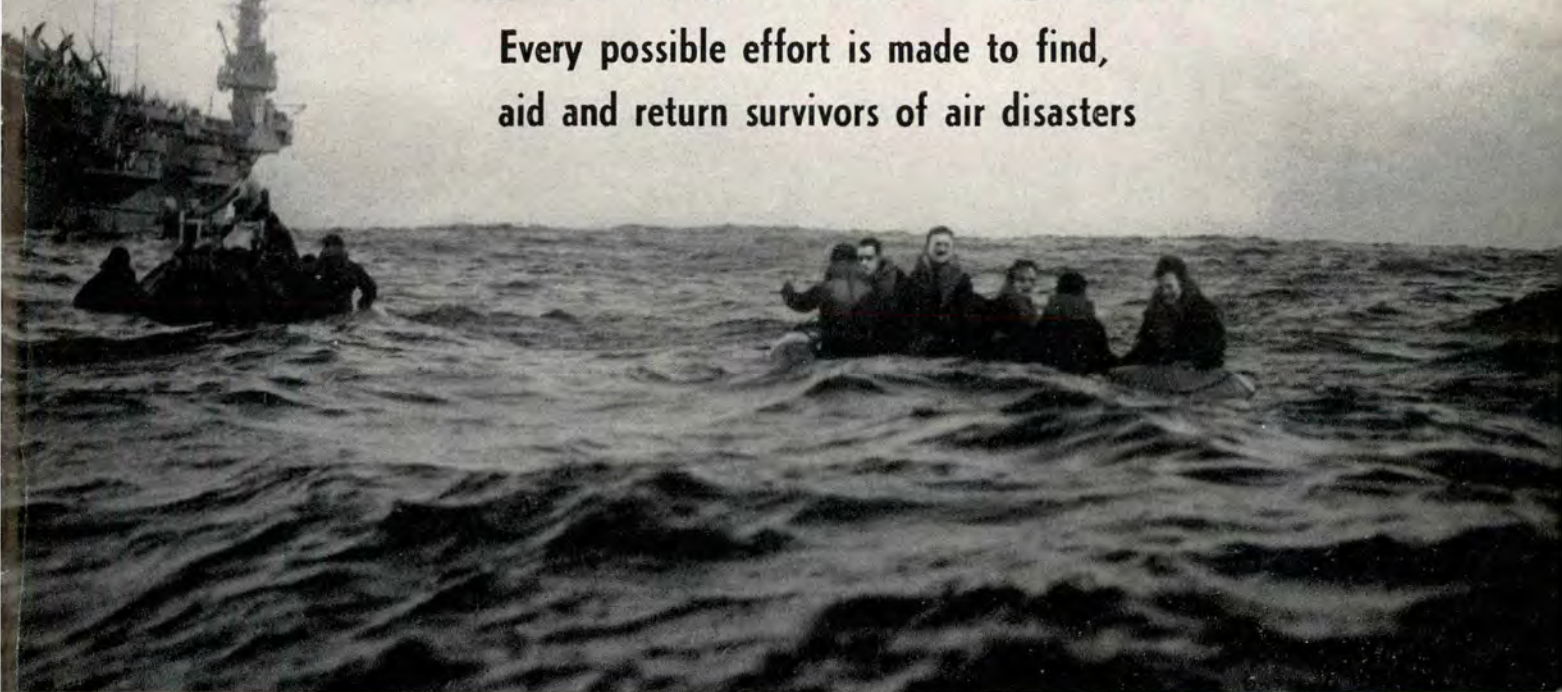


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in this issue **RESCUE AT SEA**

Down at Sea

Every possible effort is made to find,
aid and return survivors of air disasters



A carrier comes to aid of USAF crew. Survivors wear sun lotion

We can't rescue you if you are not alive.

That statement made by the Chief of the Air Rescue Service, Col. Richard T. Kight, pinpoints the responsibility of air crews engaged in overwater flights.

The Air Rescue Service has reached two very important conclusions over a period of years in the rescue business. The first of these conclusions is that time runs out all too fast throughout a search and rescue mission. Records show that the critically injured survivors of an aircraft accident usually die during the first 24 hours if not given aid. So the aim of rescue agencies is to get there first with aid in order to save the greatest number of lives.

The second of these conclusions is that it must be assumed that there is not even one able-bodied, logical-thinking survivor at the scene of the aircraft accident. This may be a startling conclusion because every man thinks, "If I am forced down, I'll make the best use of my equipment," but the records of actual rescues include numerous accounts where supposedly able-bodied logical-thinking survivors failed to accomplish extremely simple tasks in basic logical order and thus hindered, delayed and even prevented their own rescue.

The explanation is that shock following an aircraft accident is often so great as to cause those of strong mind to think and act illogically. This second conclusion clearly illustrates the need for air crews to make survival procedures second nature and to develop crew

Below are excerpts of a few of the hundreds of messages received, sent or monitored by the Coast Guard Rescue Coordination Center in New York during the search for an Air Force C-124 lost in the Atlantic. Terse as they are, they tell of the vast effort and variety of ships and planes that combed the ocean. Plane sent no SOS. Cause of crash not determined. Numerals indicate date and time: 230510Z—23 (day of month) 0510Z (Greenwich time).

230510Z—ALERT DECLARED X LAST CONTACT WITH AF 5882 0106Z X

231045Z—DISTRESS PHASE NOW OPERATIVE . . . LAST POSITION 0047Z 51.30N 27.05 W X URGENT URGENT URGENT

231434Z—AIR SEA SEARCH NOW IN PROGRESS FOR AF 5882 REQUEST CONFIRM THAT THIS AIRCRAFT DID NOT RETURN TO KLIZ

231445Z—LIMESTONE OPS ADVISE A/C PASSED POINT NO RETURN CERTAIN A/C DID NOT RETURN AND NOT AT ANY OTHER AF X AIRCRAFT BELIEVED DOWN AT SEA X REQUEST ALL SHIPS BROADCAST THIS INFO X OCEAN STATION VESSEL CHARLIE PROCEEDING LAST REPORTED POSITION TO SEARCH

231459Z—FM COMEASTAREA TO COGUARD RADIO STATIONS X BROADCAST FOLLOWING EMERGENCY 500/8280 KCS QUOTE LARGE FOUR ENGINE US AIR FORCE A/C 5882 REPORTED DOWN AT SEA X 55 PERSONS ABOARD X LAST REPORTED POSITION AT 0047 GMT 5130N 2705W X BOUND UK X ALL VESSELS IN VICINITY BE ON LOOKOUT FOR POSSIBLE SURVIVORS X LISTEN 500 AND 8280 KCS FOR POSSIBLE DISTRESS SIGNALS UNQUOTE OPERATIONAL IMMEDIATE

231645Z—FM SS CHUNGKING VICTORY . . . RECEIVED BROADCAST DISTRESS . . . ALTERING COURSE FOR SEARCH

232055Z—FM NSZV USS GEN MUIR . . . PROCEEDING TO LAST REPORTED POSITION AIRCRAFT X ETA 240500Z

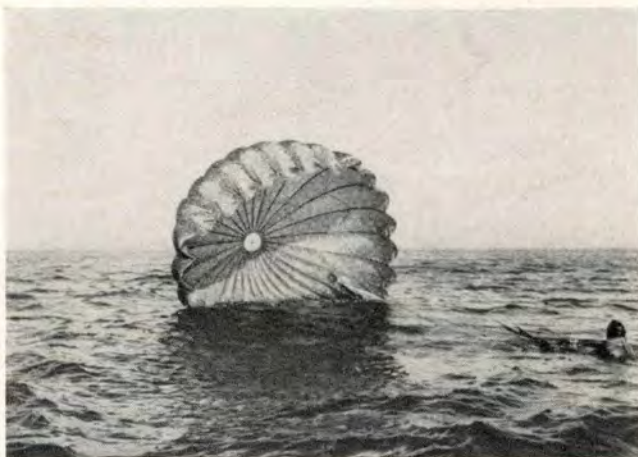
240153Z—FM SS EXCALIBUR INTERCEPTED ON 500 KCS SENDER UNKNOWN BEGINS BELIEVED TO HAVE SIGHTED WRECKAGE X

240254Z—WRECKAGE AND FLARES SIGHTED X PROCEED MAX SPEED 242120Z—CG CASCO HAS PICKED UP PILOT'S DUFFLE BAG X

272015Z—X LARGE ARRAY OF SHIPS AND PLANES IN AREA WITH UNSUCCESSFUL RESULTS X

302223Z—NO FURTHER DEBRIS SIGHTED TODAY UNLESS OTHERWISE DIRECTED CG CASCO RETURNING TO OCEAN STATION CHARLIE

Down at Sea



Rescue is speeded if a position report is made before bailout



Air Rescue Service SA-16 amphibian takes off on search mission



The USS Coral Sea joined in recent search for Air Force C-124

discipline based on the proven techniques of using survival equipment.

The first step in effecting a rescue of a crew down at sea must be taken by the pilot who experiences an emergency or observes another plane in distress.

If the first alert comes after a plane is overdue, hours will necessarily elapse before the first plane or ship begins its search. This is a strong argument for accurate and frequent position reports. Rescues of air crews downed in the open sea all tell the story that the first few hours are the most critical for survivors. If a man keeps his head and makes sensible use of his equipment from the start, he has a good chance of being alive when the rescue planes locate his position.

A probable cycle of rescue operations goes like this:

A plane in trouble or an accompanying plane indicates potential or actual distress by radio and/or IFF signals.

Receiving stations (which may be other airplanes, ships at sea or radio stations ashore) relay this information to a rescue operations center.

The rescue operations center throws the search on all available communications and direction finder (DF) facilities . . . plots a course of action . . . dispatches rescue craft . . . watches all incoming and outgoing reports from rescue craft and monitors radio communications when possible . . . arranges fighter cover, when required . . . keeps informed on weather . . . designates an on-scene commander who may be the senior officer present at the scene of the crash, or the commanding officer of the first air or surface craft to arrive at the scene.

Rescue crafts proceed and conduct search and locate survivors. Survivors are picked up, given medical attention and landed ashore.

The above may sound like a simple one-two-three procedure, but search and rescue at sea is not simple because of the condition that can best be described as *approximate*. For example: the pilot of a bomber files a flight plan of the bomber's intended flight plan across the ocean and every hour he must report this position to the nearest ATC center. Thus, the bomber's *approximate* position is known at all times, but, just how approximate is it? If the bomber is traveling at 300 MPH and if an incident occurred between reports, it could be down anywhere along the 300-mile line. Remember, also, that radio reception could be bad or the radio could go out or the plane could get lost, so *approximate* could turn out to mean almost anywhere.

When there is plenty of time, the radio operator, or the pilot in the case of a single-seat airplane, can get

The pilot witnessing a distress incident or sighting a survivor must: circle, keep survivor in sight. Drop drift markers and dye marker if the survivor does not use his. Remain at low altitude to keep survivor in sight. Establish radio communication with base or ocean station, reporting position and circumstances. Never leave survivor unless relieved, recalled, rescue is accomplished, or fuel is running low.

Cover Illustration: Various types of rescue craft are pictured in action—An SB-29 with droppable life boat, an SA-16 amphibian, a helicopter rescue, and a Coast Guard Weather Station vessel holding its position in heavy seas. Photos on cover and those illustrating this article courtesy Department of Defense, Air Rescue Service, U. S. Coast Guard and Naval Aviation News

out a good long SOS and if somebody is listening, perhaps his position will be accurately spotted and help sent immediately. But rescue people always have to be prepared for the worst to happen. The worst being such as the case of the Air Force C-124 in which there apparently was no time for the crew to even send out a short signal—then, what are the chances? When this pilot did not arrive as per his flight plan, traffic control and operations at his destination presumed the plane missing. Rescue coordination centers on both sides of the Atlantic were notified of this incident, given the airplane's flight plan and last reported position, and requested to begin search and rescue operations. After studying all available information, the rescue controllers plotted the most probable search areas and began search operations with all available aircraft and ships.

The search for the C-124 was a tremendous operation, with planes of the U. S. Air Force, U. S. Navy, U. S. Coast Guard, and the Royal Air Force flying hundreds of sorties over the entire Northeast Atlantic. Warships, Coast Guard cutters, military transports, ocean liners and freighters were diverted from their courses and stations to criss cross the vast stretches of ocean. Only tragic bits of wreckage were found; no survivors.

The same means of search employed since the airplane was invented—visual search with the human eye—is still the means by which survivors are most often located. This system is very costly when you consider that on some of the bigger missions up to 100 aircraft have been employed on search for days.

The number of aircraft and ships required to take part in a search seems to be directly proportionate to the lack of position reports and adequate signaling equipment aboard the life rafts.

In one case, a B-29 ditching in the Atlantic with its position only *approximately* known, 151 sorties were flown over a period of four days, for a total of 1,194 hours, before the survivors were sighted. In addition to this vast aerial search, numerous ships of the United States and British Navies, as well as the United States Coast Guard, participated. The area searched extended 650 miles from north to south, and 750 miles from east to west, or, roughly equivalent to a rectangle with corners at New York, Chicago, Little Rock and Charleston.

The refueling unit on an island at the center of the search area issued 338,420 gallons of gasoline and 14,162 gallons of oil to searching aircraft during the four-day period. In addition to this huge expenditure, the mission was supported by planes operating from continental bases. The effort paid off when the crew was located by an alert scanner in an SB-17.



An Air Rescue operations officer briefs pilot for search flight



Destroyers rushed to scene of C-124 distress in North Atlantic



Submarines have rescued numerous airmen forced down at sea

Action by survivors afloat to attract attention: "Gibson Girl" transmitter, operate at least five out of each 15 minutes coinciding with international listening periods at X-15 and X-45 o'clock if possible. Self-contained radar beacon transmitter, operate periodically. Radar reflector, erect at once. When search craft are seen or heard, also use pyrotechnics, flags, mirrors, dye marker, and whistles in fog or darkness.



After ditching, airmen row to rescue boat dropped by FEAF B-17



Ocean is plotted into search areas at Air Rescue Service Center



Ships on Weather Patrol maintain station far at sea regardless of weather. To assist in search and rescue, Coast Guard ships are fitted with extensive communications and navigation aids. Continuous watch is kept on distress frequencies 500 and 8280 kcs; the aircraft VHF emergency frequency 121.5 mcs, and aircraft check-in frequencies 118.1 mcs and 4220 kcs. They are also equipped for tracking weather balloons and plotting aircraft, positions, tracks and groundspeeds.

Rescue aircraft and vessels operate as a group to accomplish a common mission, and the essence of completing a successful operation is close teamwork.

If the crash is at sea and beyond helicopter range, then an amphibian with medical aid aboard may land and evacuate the survivors. If the sea is too rough for amphibians to land, then other aircraft can drop an airborne lifeboat, equipped with aid supplies. Pararescue survival specialists can also be dropped to assist the injured survivors aboard the lifeboat and render them first aid until the seas calm to permit amphibian landings or until larger surface craft arrive.

The Air Force is now receiving two pieces of equipment that will assist in the solution of the notification and search phase of the mission. One item is an automatic keyer which is a small two-pound unit that can be wired to existing high or very high frequency radio sets—and by the flip of a switch on the part of a radio operator or other crew member, will turn on the transmitter, select a preset frequency and send a distress S.O.S. The other piece of equipment is a small personalized survival transceiver, which is called the URC-4. It weighs about 4½ pounds and transmits or receives very high frequency over line of sight distance. It will be carried aboard all aircraft and when used by survivors, will assist in the close-in search effort. It should prove most useful in aid and rescue operations as well, in that it will permit communication with the survivors.

To solve the big problem of finding survivors, the USAF has under development a so-called Crash-Locator Beacon and a Crash-Locator Bearing Recorder. The crash locator beacon is an electronic device to be installed in all USAF aircraft. It will be so designed that upon crash impact it will be automatically ejected from the aircraft and begin transmitting distress signals instantly on high or very high frequencies. It will transmit a signal on standard distress frequencies on which bearings can be taken by ground stations and on which search aircraft can home in. The crash-locator beacon bearing recorder is an automatic receiver which will be capable of recording the signal of a crash-locator beacon and of taking and recording bearings on such signal. An alarm device will be incorporated in the receiver which will call to the attention of the attendant that the signal is coming in. The attendant can then alert the rescue organization directly and help will be on the way in a matter of minutes.

Aircraft Distress Communication Procedure — When an aircraft is threatened by serious and imminent danger and requires immediate assistance, the pilot will: Turn on IFF emergency—Transmit SOS on radiotelegraph

and/or MAYDAY on radiotelephone followed by aircraft identification and a 20-second dash. When VHF is used, transmit MAYDAY (three times) followed by call sign of aircraft (three times).—On completion of the above distress calls, the following information should be transmitted: best estimated position, time, course, speed, altitude, nature of distress, and intention of aircraft commander as to ditching, bailing out or crash landing.

The first transmission by the aircraft will be on the assigned air-ground frequency or the frequency of last communication contact. If the aircraft is unable to establish communications on the above frequency, one or more of the following will be used: The international distress frequency, 500 kc—U.S. emergency and safety frequency, 8280 kc—International emergency VHF frequency, 121.5 mc—and any other available frequency in an effort to establish communication with any ground station. The distress call and message should be repeated at intervals on the various frequencies utilized until an answer is received.

Immediately prior to ditching, bailing out or crash landing, the pilot or radio operator will tie down the radiotelegraph key. If the aircraft is equipped with VHF, the pilot will break the safety wire on the VHF control switch and throw the switch to transmit position, or use any other means available to obtain continuous transmission.

If the aircraft no longer is in distress, a message canceling the state of distress must be transmitted on the same frequency or frequencies used for transmitting the distress calls and messages.

The USAF, through the Air Rescue Service, has launched into a program of training rescue specialists, standardizing search and rescue techniques and procedures, and procuring special equipment. When this program is carried to completion, it will be possible to complete a rescue mission in a matter of hours instead of days, as at present. In the meantime, however, all members of air rescue organizations continue to abide by the policy that: Air Rescue Service exists only to save lives; the probability of finding survivors diminishes with each minute that passes after an air disaster occurs; in each and every incident it must be presumed that there are survivors, and every possible effort must be made to find, aid and return these survivors to safety. Furthermore, that the thoughts and efforts of every man be directed toward creating an organization better equipped and trained to carry out any rescue by day or night in the least possible time so that all will know that no life has been lost through a wasted minute or a misdirected effort.



Pararescue teams are prepared to jump to aid of downed flyers



Crew of 3rd Rescue Squadron scramble for mission at base in Japan



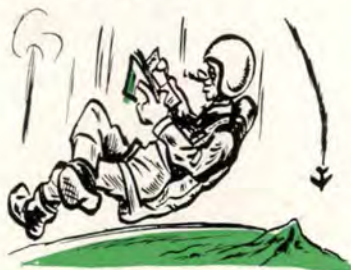
The search and rescue control room has all latest information on the availability of rescue units and any other ships that may help a plane in distress. The New York Coast Guard Center plots positions, courses and speeds of military and large merchant vessels in the North Atlantic. Selected ship positions from this plot, showing radio watches are transmitted daily to all international airdromes on both sides of Atlantic for the information of flight crews planning overseas flights

KEEPING CURRENT

RESERVE TRAINING—Officers and Airmen being brought back to EAD at Olmsted AFB are being given a one or two-week course, depending on their activity in the Reserve program. "Project Pitch-In," is an AMC refresher and orientation course. An officer who has been active in the Reserve program will receive the one-week course, and officers with little or no reserve activity will be given an additional week's refresher in what is called "Interim Officer Training."



FIGHTER BAIL-OUT has been simplified by two new developments of Air Materiel Command: first, the quick disconnect assembly that combines all attachments such as oxygen supply, G-suit hose and radio headset wires into one cable that breaks when the ejection seat is fired. The second improvement is the relocation of the emergency oxygen supply from the ejection seat to the pilot's body, thus permitting pilots to leave the seat and free-fall until pre-set automatic chutes (F-1) open. These changes in bail-out technique will eliminate buffeting and windblast caused by riding seats down to lower altitudes.



3rd ARS—KOREA—To further bolster the morale of downed airmen the H-19 Sikorsky ten-place helicopter flew two sorties and carried out 15 men during the biggest scale of operations by the 3rd Air Rescue Squadron to date. In two days, 77 sorties were flown through intense mortar and small arms fire and evacuated 148 men.

The H-19 was recently flown to Japan by Air Proving Ground aboard a C-124



and is undergoing operational service tests in Korea.

FISH NET—The Aero Medical Lab at Air Materiel Command has devised a new fish-net type harness to keep the "troops" from rattling around in the rear passenger compartment of cargo and transport planes and assault gliders. Designed specifically for added protection to the fully equipped paratroopers and combat infantrymen, it can withstand a crash force of approximately 8,000 pounds or 32 G's.

This harness easily fits over the wearer plus a 150-pound pack; has already passed its tests in the Air Force's human decelerator sled at Edwards AFB, Muroc, California, and is slated to become standard equipment.



FORECASTING HAIL—Until recently, most meteorologists have been rather pessimistic about the possibility of making accurate locality or seasonal forecasts of hail occurrences and intensity. However, during the past year, attempts by the Severe Storm Warning Unit of AWS in forecasting the location of hailstorms and the average size of the stones, have met with very encouraging results.

There is now a good prospect that such quantitative forecasts can ultimately be refined to a point where all flights can be routed to avoid serious hail damage. Meanwhile, pilots should heed the short range forecasts of the likelihood of thunderstorms which are relatively accurate and provide a sort of first approximation to the chances of damaging hail.



In the Spring, the heavy hailstorms of the region just east of the Colorado Rockies occur mainly to the rear of a cold front or of a deep "cold-low" passing eastward, but in other months there does not seem to be any particular relation to air mass, fronts, lapse-rates height of freezing level, or wind pattern.

Attention of all pilots should be given to the AF Reg 55-29 which is a questionnaire on hail encountered in flight. It is felt that close cooperation between pilots and weather forecasters will bring about a more accurate plotting of the severest hail conditions and the danger zones to

be avoided. Reports from AWS state that these hail questionnaires are already being returned in numbers, indicating more frequent hail encounters by aircraft than had been surmised.

PILOTAGE—Many a USAF pilot, lost or temporarily "misplaced" has thanked an alert CAA radio communicator for safe guidance to his destination, or to a field where a successful landing could be made.

Most of these communicators are pilots in their own right and can "fly" a plane from their little house on the ground, bringing the craft out of an emergency situation to a safe landing. By being familiar with the surrounding terrain and the location of landmarks and their appearance from the air, it is not too difficult for an alert operator to locate a pilot from his description of the territory over which he is flying.

To cite a few examples of this: A night-flying National Guard pilot contacted CAA radio at Macon, Ga., and reported his position as unknown. Visibility was reduced because of thunderstorm activity in the vicinity. Landmarks were difficult to distinguish in the darkness. Then the operator communicator thought of the searchlight used to advertise a certain drive-in theater. The operator of the theater was requested to leave the searchlight on. About an hour later the alerted pilot saw the powerful beam, determined his position, and proceeded to a safe landing.

Another pilot's position was established when he reported passing over a swimming pool. A sharp communicator remembered there was only one town in the vicinity with such a swimming pool.

A military aircraft lost near Knoxville, Tenn., was brought in safely after the communicator kept in continuous contact with the pilot for 21 minutes, relaying steerages and identifying landmarks. The plane was landed with but five gallons of fuel in the tanks.

One communicator, checking through some flight plans, saw that a pilot was headed into an area where a violent storm was developing. The pilot was warned and changed his route.

These are but a few of the daily assists given to the airborne by the chairborne. Don't hesitate to call upon these CAA guardians of the airways, if you become lost or confused—they might be able to save YOUR life.



CROSS FEED

FLYING SAFETY IDEA EXCHANGE



CARE OF PARACHUTE — Perhaps like all parachute riggers I was attracted to the pictures of the parachutes on page 9 of the February issue of *Flying Safety*.

I am going to ask the following question: "What is wrong with this picture?" As innocently as it looks, I think that this should be the last picture that would be printed in *Flying Safety*. Why?

Being mainly concerned with the maintenance and operation of the parachute, I am going to say what is wrong with this picture. This picture shows the carelessness upon the part of the airmen whose lives are concerned. Taking care of a parachute in such a manner shortens its life. There is no telling what foreign element and stains the parachute will come in contact with when placed on the floor. Gasoline, oil, hydraulic and grease stains cause deteriorations of the parachute pack, parachute harness, the parachute canopy and the lines. It is the experience of this parachute rigger to officially say that less than 25 per cent of all the parachutes constructed ever see the complete harness or canopy life expectancies.

Parachutes should be conserved properly and they will function properly.

S/Sgt. Nicholas S. Battipaglia
Parachute Rigger USAF

Editor's Note — Flight Safety Research agrees with Sergeant Battipaglia that proper care of the parachute cannot be over-emphasized. The picture under question, unfortunately had to be reduced for publication to such size that the canvas strip upon which the crew placed its equipment for inspection is not clearly visible. Strategic Air Command crews do use such a protective covering over the ramp during their inspections. A portion of this same picture has been blown up to show that proper procedure was followed in this case.

HANDY HULL — Ingenuity and forethought could easily be included in the occupational description of Sgt. James H. Vickers of Air Rescue Service Flight B, 6th AR Squadron, at Ernest Harmon AFB, Newfoundland. By solving a problem through salvage reclamation, Sergeant Vickers' idea not only increased operating efficiency of his flight but also boosted savings of the USAF economy program.

While watching a trailer truck as it hauled a condemned C-54 hull to the dump area for burning, Sergeant Vickers — remembering last year's storage difficulties — had an idea the discarded hull might still be usable. He immediately obtained permission from his commanding officer to have

it placed in the flight area, where he and his crew of helpers lost no time in restoring its usefulness. Soon the airmen had transferred the condemned eyesore into an attractive storage building. They even painted it yellow, with black diagonal stripes — the Air Rescue Service colors.

The 60x10-foot fuselage provided ample room at one end for storage of Flight B rescue vehicles and power units, the remaining space being used for storage drums of oil, fuel, solvents and grease—all readily accessible. Indoor storage and use of the normal C-54 heating system eliminated freezing of the fluids which heretofore had impaired flight operations.

FLAP RETRACTION — Pilots flying the B-50 or the B-29, or any other aircraft on which flap retraction at take-off is critical may be interested in the following discussion. As most pilots know, flaps produce a greater lift coefficient, i.e., more lift force per square foot of area per mile per hour of speed. They also produce greater drag, and when the flaps are retracted these two effects disappear simultaneously. However, because of the inertia effect of the mass of the airplane, a reduction in the drag coefficient is not instantly accompanied by a corresponding increase in speed. Some time is re-



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Well Done to Warren I. KRAFFT

SA-16 CREW
CHIEF - 2156TH
AIR RESCUE UNIT
MACDILL AFB.



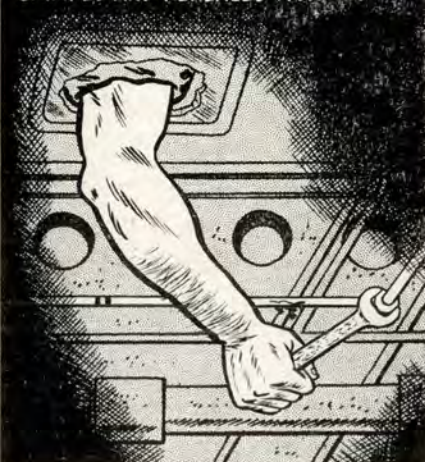
FOLLOWING A GO-AROUND THE GEAR HANDLE WAS BROUGHT "UP"...INDICATORS AND INSPECTION SHOWED MAIN GEAR UP, NOSE WHEEL DOWN AND HYDRAULIC PRESSURE ZERO.....



WHEN THE EMERGENCY HAND PUMP WAS USED HYDRAULIC FLUID WAS SEEN SPURTING FROM A BROKEN LINE IN THE NOSE WHEEL WELL...COVERING THE GLASS INSPECTION PLATE WITH A JACKET SGT. KRAFFT SMASHED AN OPENING THROUGH WHICH HE COULD REACH THE LINE.....



THIS SPACE WAS TOO SMALL TO MAKE THE REPAIRS AND SEE THE WORK AT THE SAME TIME...HE REMOVED THE TUBING BY FEEL, BROUGHT IT INTO THE AIRCRAFT, CRIMPED AND REPLACED IT.....



THEN WITH GEAR HANDLE "DOWN" AND USING THE EMERGENCY HAND PUMP, THE GEAR WAS LOWERED AND LOCKED AND A NO-DAMAGE LANDING WAS MADE!



HIS THOROUGH KNOWLEDGE OF HIS AIRCRAFT AND INGENUITY OF DIAGNOSING AND REPAIRING THE TROUBLE KEPT A VALUABLE AIRCRAFT ON FLYING STATUS—FINE JOB, SARGE!!