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U. S. Air Force Historical Study No. 95

AIR-SEA RESCUE

1941-1952

Prepared by the USAF
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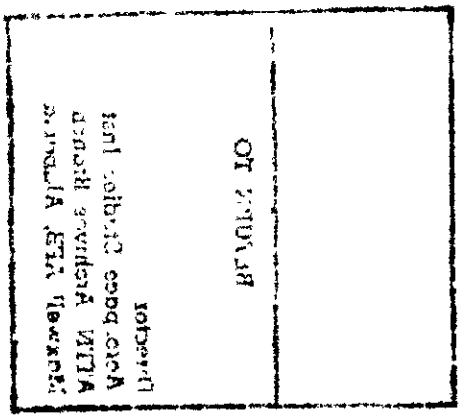

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F O R E W O R D

This monograph examines the development of air-sea rescue in the Army Air Forces through World War II. The postwar period is briefly reviewed, and Air Rescue Service operations in Korea are studied through June 1952. This history was written by Frank E. Ransom, of the College of St. Thomas, St. Paul, Minnesota.

Like other Historical Division studies, this monograph is subject to revision, and additional information or suggested corrections will be welcomed.

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CHARTS AND TABLES

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AIR-SEA RESCUE

1941-1952

Chapter I

INTRODUCTION

> The history of air rescue began in World War II. Prior to the advent of large bomber and fighter fleets, little consideration had been given to the search for and, retrieving of, missing or crashed airmen. The distressed aviator was searched for in a haphazard fashion, utilizing the means available with little thought to organized protection such as mariners then enjoyed.[1]

The enemy in Europe could first be reached only by overwater flight. The air war in the Pacific presented a similar situation in exaggerated form. Accelerated training in the Zone of Interior, overwater flights by tactical aircraft en route to the theaters of war, transportation of personnel and supplies by air, antisubmarine activity, convoy defense, and patrol duty were additional factors creating a need for a world-wide air-sea rescue service.[2]

> Under the personal guidance of General H. H. Arnold, a rescue program was initiated, crews trained, equipment procured, and rescue squadrons activated.

> Needless to say, the morale of personnel of operational flights increased many-fold when they realized that their chances of being saved after crashing were good. Not only did the efficiency of the flyer improve by the realization that he had a chance of being rescued, but a considerable saving in valuable manpower resulted. The rescue of one highly trained airman not only saved his life, but also the time and expense of training his replacement.

Early AAF attempts at air-sea rescue leaned heavily upon the RAF for guidance and support. British-operated rescue control centers served as models for those established by the AAF, and British air and sea craft carried the major burden of rescue responsibility in the European and

Mediterranean theaters of war, as they also did for flights originating in India.

In the Pacific theaters little aid was received from the British, and for that reason the greatest amount of AAF air-sea rescue effort was expended in that region. Rescue attempts in the Pacific were at first limited by lack of knowledge, manpower, and equipment, but as the importance of rescue operations was recognized, these obstacles were overcome and an efficient policy for air-sea operations was developed.

Inter-service cooperation was early recognized as essential to efficient rescue operations. It was often achieved between operational units and sometimes even at higher command levels, but during all of World War II efficient planning was hampered by the failure of the Army and Navy to agree on rescue responsibility. This basic question was not settled until the postwar period, when the AAF delegated its responsibility for rescue to the Air Transport Command. The Air Rescue Service (ARS) which was then formed gradually extended its range until it became a world-wide organization.

In the Korean war ARS assumed the additional responsibility of evacuating wounded by air from front-line positions. Use of ARS helicopters was a major factor in reducing the mortality rate of wounded soldiers to one-half that of World War II figures.

Chapter II

ZONE OF INTERIOR

Planning. The Battle of Britain first established the need for an organized rescue effort. Observation of British rescue activity eventually led to discussion of air-sea rescue among the Joint Chiefs of Staff (JCS) in December 1942.[1] The original problem--that of coordinating the supply and distribution of emergency rescue equipment--developed into a controversy on whether a separate agency for rescue service should be established, or whether primary responsibility should be delegated to one of the services. For a time it was thought that the Coast Guard, because of its traditional rescue mission, should be the agency to control air-sea rescue. In a letter of 23 July 1943, Coast Guard commandant Adm. Russell R. Waesche presented the factors qualifying the Coast Guard for this responsibility, stating that he regarded air-sea rescue as "a most proper function of the Coast Guard."[2] A subcommittee of the JCS Joint Administrative Committee, set up to study Admiral Waesche's recommendation, felt, however, that the Coast Guard would face "insuperable obstacles if it attempted to expand" into all types of rescue activity.[3] It concluded that each service should be primarily responsible for rescue of its own aircrews, and that therefore each should continue its separate activities, delegating immediate authority to the theater commanders. Because of the lack of coordination between existing rescue services, it recommended that a central coordinating body be established in Washington with representatives from each service. The

result of the subcommittee's recommendation was the establishment of the Air-Sea Rescue Agency early in 1944 by request of the JCS. The directive establishing the Agency stated its function as follows:[4]

> The Agency will conduct joint studies and assemble information, disseminate that information with appropriate recommendations for action to all interested agencies of the United States, and maintain liaison with agencies of other United Nations, on two phases of Air Sea Rescue. One of these phases embraces work with technical data concerning research, development, and design of air-sea rescue equipment; the other involves methods, techniques, and procedures involving the adequacy for facilities for Air Sea Rescue.

In anticipation of the subcommittee's decision, the AAF had established an Emergency Rescue Branch in the Office of the Assistant Chief of Air Staff, Operations, Commitments, and Requirements Division on 25 August 1943. The branch, whose authority had formerly been exercised by the Director of Flight Control, planned and supervised the AAF emergency rescue program, determined the tactics and techniques of emergency rescue, established training standards, and allocated rescue units to the various theaters. Once the units were assigned, the Emergency Rescue Branch had no control over them.[5]

Meanwhile by the summer of 1943 AAF planning for air-sea rescue on a world-wide basis had reached the point where definite recommendations could be made. The world-wide rescue plan sent to Gen. Henry H. Arnold, Commanding General, Army Air Forces, for his approval on 6 July 1943 recommended that two squadrons be activated immediately, that in order to save time the personnel requirements be met from the men that had been made available for the dive-bomber program, that the program be initiated and monitored by the newly established Flight Control Command, and that command of

air-sea rescue units and operations in theaters be under the theater commanders. On Air Transport Command routes ATC wing commanders would be in control.[6]

By 28 August the planning for air-sea rescue had broadened so as to envisage 7 squadrons, each equipped with 12 PBY's and 4 liaison-type planes.[7] Equipment and personnel shortages and the lack of training facilities made these objectives difficult to attain. The 1st Emergency Rescue Squadron was not activated until December 1943, despite a request from Gen. Dwight D. Eisenhower for speedy action in sending rescue squadrons to his theater.[8]

In August 1944 centralized planning for emergency rescue in the Zone of Interior (ZI) was the subject of a high-level AAF conference attended by representatives of the Training Command, the Air Transport Command, the numbered air forces in the United States, and I Troop Carrier Command; and by training and flight control officers of various sections in AAF Headquarters: AC/AS, Management Control; the Emergency Rescue Branch; and the office of the Air Communications Officer.[9] The policy discussed was that proposed by Maj. Gen. Laurence S. Kuter, AC/AS Plans, in a memorandum dated 5 August 1944. This proposal envisaged standardization of distress procedure, the designation of one responsible agency within each area of operation, with that position delegated to each of the numbered air forces within the United States, the formation of composite squadrons to answer all rescue needs, inclusion of the Air Transport Command as a responsible agency for emergency rescue when the theater programs proved insufficient, close coordination of rescue activities accomplished through joint control

centers, and continuation of the joint Air-Sea Rescue Agency to insure cooperation on the highest levels. The memorandum concluded with a reiteration of the interest of the AAF in air-sea rescue. Emergency rescue was "as necessary a part of the Air Force as any other supporting combat units."[10]

All present agreed with most of the proposals in principle, but representatives of the First, Second, and Third Air Forces raised a number of specific objections. First Air Force representatives objected to inclusion of any region west of the Appalachians in their area of responsibility on the grounds that their training interests did not extend in that direction. On the other hand, they felt acute interest in the Savannah-Charleston region, which was under the control of Third Air Force. They also expressed fear that duplication of existing Navy and Coast Guard organizations would result from adaption of any extensive AAF rescue system.[11]

Third Air Force objected to its area of responsibility with the plea that it was too large, pointing out that flying conditions in the southeastern states (the Third Air Force area) led other air forces to schedule many training flights into that region. Thus Third Air Force would bear more than its proportionate share of the burden of rescue responsibility. They offered an alternative plan---that all Zone of Interior commands share the responsibility for establishing an emergency rescue system. The component parts of this system would be responsible to one emergency rescue command to be located at one of the airway traffic control centers.[12]

Fourth Air Force had no objection to the proposals, but Second Air Force raised the question whether base commands could not continue to do the job and do it better.[13] Despite all of these objections, the continental air forces were directed to submit their individual rescue plans by 1 September 1944, but no action resulted until the following spring, when the original plan was modified in the light of postwar planning.*

Operations. Although high-level planning for air-sea rescue did not begin until late 1942, some continental air force commands began rescue activities earlier. Because of its large number of training and administrative missions involving overwater flight, Third Air Force was particularly concerned with the problem of sea rescue. As early as 1941 a program emphasizing rescue by boat was launched. Base operations officers were given additional duties as air-sea rescue officers, and made responsible for all rescue operations. Civilians who could handle small boats and launches were hired to supplement the available military personnel, and the mixed crews often used civilian pleasure boats, poorly equipped for the job. These conditions produced less than satisfactory results; they were partially corrected in the fall of 1942 by the commissioning of eligible citizens as warrant officers and discharging of all others.[14]

Each Third Air Force base operated its own service, and little coordination between bases or with naval and Coast Guard facilities was effected. The inefficiency resulting from this lack of centralization

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*See Chapter VIII.

and coordination finally inspired Third Air Force to develop a plan for integrating all of its rescue services. This program, which was put into effect on 15 July 1944, divided Third Air Force bases into four geographic groups, each with a control center which was responsible for all rescue within its assigned area. The control centers were to establish and organize air-sea rescue facilities within their designated areas in conformity with the Third Air Force air-sea rescue plan, and were made responsible for obtaining the equipment which might be necessary for their operations. The control officer in each center was to coordinate the activities of crash boats and search planes during an air-sea search and pickup mission, and was required to maintain direct contact with the Navy, Coast Guard, and any other domestic air force and command having rescue facilities in the Third Air Force flying area.[15]

While this plan was being formulated, a greater degree of cooperation with the Navy and Coast Guard was in the making, aided by a series of conferences between Third Air Force, Navy, and Coast Guard representatives in the Third Air Force region of responsibility.[16]

In the fall of 1944 a further revision of Third Air Force rescue organization was made, and additional equipment assigned for rescue purposes. The most important change was the appointment of full-time emergency rescue officers to discharge the task previously assigned as an additional duty to the base operations officer. Additional equipment consisting of 40 liaison-type aircraft was secured. These planes were to be used exclusively for rescue purposes, and were plainly designated as such.[17]

The efficiency of the revised air-sea rescue organization of Third Air Force was demonstrated by statistics compiled for November-December 1944. Twenty-one rescue missions, both by land and sea, occurred in those months. In each case the plane and personnel were located and survivors or bodies recovered. There were 8 water incidents involving 31 men--14 of whom were rescued.[18]

In February 1945 an AAF regulation which included a uniform plan for air-sea rescue in the ZI was published.[19] The regulation defined and assigned areas of responsibility for emergency rescue, prescribed the establishment of emergency rescue control centers by each continental air force, and delegated authority for emergency rescue services along foreign routes of air travel to the Air Transport Command. In accordance with the new plan, Third Air Force established seven control centers, with area control centered at MacDill Field, Tampa, Florida. Each center was relatively autonomous within its own geographic areas, but matters of broad policy or incidents involving more than one control center area were the province of area headquarters at MacDill Field. In addition, a Search and Rescue Branch was established within the Division of Operations and Training, Headquarters, Third Air Force to exercise over-all supervision. Staffing these centers proved a problem, but by 1 April all except one were adequately manned.[20]

Although Third Air Force had accepted its share of the responsibility for continental emergency rescue and had altered its organization to conform with the new regulation, its arrangements were not entirely satisfactory

to Headquarters, AAF. The Third Air Force plan did not provide for units made up exclusively of rescue personnel, and was therefore deemed unsuited for the rescue needs of the area. The air force was so informed in the spring of 1945, but no remedial action was taken until 22 August, when the 303d AAF Base Unit for Search and Rescue was activated.[21]

With the creation of this specialized search and rescue unit, Third Air Force brought its rescue organization into line with those already formed in the Second and Fourth Air Forces and the Alaskan Division of the Air Transport Command. Earlier, in a conference held at Washington in May 1945, representatives of Third Air Force, Second Air Force, Air Transport Command, Antilles Air Command, and Caribbean Defense Command had argued the question of rescue responsibility in the Gulf of Mexico and the Caribbean, and agreed on definite areas of responsibility.[22]

Until the late summer of 1945 Third Air Force equipment for air-sea rescue was largely restricted to L-5's (small liaison aircraft), operational aircraft not assigned to rescue facilities, rescue boats, and some naval and Coast Guard equipment. Although two B-17 aircraft with droppable lifeboats had been obtained from the Second Air Force in June, no crews with the requisite training were available by September. Nor had requests for helicopters to aid in air-sea rescue been fulfilled by that time.[23]

Despite these difficulties in obtaining manpower and equipment, an impressive total of 287 persons were saved by Third Air Force rescue units in 129 searches in the 5-month period ending 2 September 1945. This total included both land and sea rescue. The importance of radio homing aids was emphasized by the fact that missing aircraft in 93 incidents were located through preliminary radio search from direction-finder stations.

A waste of time, manpower, and equipment was revealed, however, in the 1,047 searches induced by false information. Disregard of flight directives and misuse of emergency equipment were directly responsible for the majority of these false alerts.[24]

Although in Third Air Force the need for air-sea rescue had been foreseen at an early date (1941), the organization for its successful prosecution was not achieved until the last year of the war. It was late in 1944 before rescue became sufficiently important to those responsible for training activities to warrant the appointment of full-time rescue officers, and the organization suffered from lack of coordination until centralization was forced by higher authority. Full-time rescue equipment, with the exception of boats, was scarce until autumn 1944. From Charleston, South Carolina, along the coast to Corpus Christi, Texas, Coast Guard and AAF agencies could provide, in 1943, approximately 60 rescue boats, but only 5 aircraft, amphibians and seaplanes, used exclusively for rescue purposes. Off shore, in the Bahama Islands area, there were 1 PBY (Navy patrol bomber) and 2 rescue boats with ranges up to 500 miles which could be added to this total.[25]

AAF air-sea rescue along the Pacific coast was the responsibility of Fourth Air Force, but a working agreement between Western Sea Frontier (a Navy command) and Fourth Air Force gave the former operational control over sea rescue, and assigned Fourth Air Force a similar position in regard to land rescue.[26] The Fourth Air Force search and rescue plan formulated in 1944 envisaged an air force controller and three base organizations: the 410th, 411th, and 412th AAF Base Units. These units were responsible for control and coordination of search and rescue functions within their

respective areas. Initiation of local action was the duty of base emergency officers. The memorandum directed cooperation and coordination with the Navy, Coast Guard, Marine Corps, Second Air Force, Army Airways Communication System, ATC, and Army Flight Control. No Fourth Air Force aircraft were specifically earmarked for search and rescue, but eight detachments were designated for this purpose: two in Puget Sound, three on the California coast, one on San Francisco Bay, one on the Columbia River, and one at Moses Lake, Washington.[27]

In the first 5 months of its existence (September 1944-January 1945) the Fourth Air Force rescue organizations received 259 alerts, of which 152 were false, and assisted in the rescue of 179 survivors (54 of these, almost one-third, were rescued from a burning tanker in January 1945). Fourth Air Force aircraft and base crash equipment were involved 31 times. Radio facilities of the Fourth Air Force were used 167 times in search and rescue incidents, and rescue boats 27 times. Emergency Identification Friend or Foe (IFF) equipment proved especially valuable as an aid in the location of missing planes. In January alone 9 crashes were found by this means, and IFF gave the first indication of an emergency in 11 cases out of the total of 87 for the month.[28]

In 1944 Navy agencies on the Pacific coast were employing PBM's (patrol bombers) and JRF's (amphibious aircraft) for air-sea rescue. The Hawaii-mainland route had been rendered safer when three plane-guard vessels* were stationed along the path of air travel. It was hoped that

*Ships stationed at specific points along the route to afford radio fixes, provide weather information, and pick up survivors if a distressed aircraft crashed in their vicinity.

the number of these ships could eventually be increased to 23.[29] In April 1945 a primary air-sea rescue intercommunication frequency, 3,000 kilocycles, was adopted and by May of that same year the Navy was using airborne lifeboats based at San Diego and San Francisco.[30]

Air-sea rescue on the Atlantic coast was largely the function of Navy and Coast Guard facilities, although First Air Force units at five locations cooperated in search and rescue activities. The presence of Navy equipment in large quantities (including three PBY's, one PBM, one JRF, one helicopter, one blimp, seven 104-foot and ten 63-foot rescue boats) and of 41 Coast Guard lifeboat stations made an extensive AAF organization quite unnecessary.[31]

Responsibility for air-sea rescue was vested in the Commander, Eastern Sea Frontier, who delegated the authority for action to task unit commanders through the five task group commanders (Southern, Chesapeake, Delaware, New York, and Northern). The task units were teams of rescue planes and boats kept continually on the alert. When notified of an emergency, the task unit commander dispatched rescue equipment to the scene and notified the group commander. The latter dispatched additional aid if necessary, forwarded the information to the Commander, Eastern Sea Frontier, and could request further help from that source.[32]

Headquarters, Eastern Sea Frontier and each group headquarters maintained a control center, which included an operations control room where a 24-hour watch was held. All ship and plane movements in each area were plotted on a steel-backed chart. Magnetic "blips" were used to indicate ship and plane positions. When a craft was in trouble,

its position was plotted and the air-sea rescue unit nearest the point of emergency was instructed to dispatch rescue planes and vessels. Since the position of all air and sea craft within the area was constantly checked, it was also possible to call on naval and merchant vessels, patrol planes, and fishing craft. Any craft that could be reached by radio was considered a potential rescue agent.[33]

An elaborate plan for communications procedure was established by Headquarters, Eastern Sea Frontier. Communications services available included:[34]

1) The Navy and Coast Guard networks.

2) The Coast Guard safety and distress radio organization.

3) Medium frequency (MF), high frequency (HF), very high frequency (VHF), and direction-finding (D/F) networks.

4) Radar stations.

5) Plotting centers, surface and air.

6) Weather services.

7) Army and Civil Aeronautics Administration (CAA) services as made available by agreement.

8) Aids to navigation (radio ranges, homing beacons, IFF, CAA interphone, flight-control centers, instrument-approach systems, searchlights, etc.).

Direct lines, known as command circuits, were also maintained between Eastern Sea Frontier headquarters and each group headquarters and between group headquarters, task unit headquarters, air stations within the group and any other organizations with air-sea rescue facilities.[35]

Available communication frequencies included:[36]

1) Regularly assigned frequencies for aircraft to base and surface vessel to shore.

2) 385 kilocycles--Secondary homing frequency.

3) 414 kcs--Preferred homing frequency.

4) 500 kcs--International distress frequency, continuously guarded.

5) 2,670 kcs--Coast Guard primary frequency for vessels in distress.

6) 2,716 kcs--Navy frequency for bases and boats.

7) 3,000 kcs--Voice only, used by air and surface craft for intercommunication regardless of service affiliation.

8) 3,105 kcs--Guarded by most towers, reserved for aircraft.

9) 4,200 kcs--Army ground stations.

10) 4,495 kcs--General air-ground frequency for Navy, Army, and CAA.

11) 4,595 kcs--Army air-ground frequency.

12) 6,210 kcs--International aircraft frequency.

13) 8,200 kcs--Army primary airfields.

14) 8,280 kcs--U.S. emergency and safety frequency, continuously guarded.

15) 116.10 megacycles--World-wide airport VHF.

16) 126.18 mcs--Army common VHF.

17) 140.58 mcs--Command, air-sea rescue and emergency frequency; prescribed by Commander, Aircraft Atlantic on 1 February 1945.

18) 142.74 mcs--Airport traffic control frequency; prescribed by Chief of Naval Operations on 1 February 1945.

Detailed communications instructions for personnel in distress were also issued by Eastern Sea Frontier. In brief, distress procedure consisted of:[37]

1) Turning on the IFF emergency switch to transmit an automatic distress signal.

2) Sending an SOS, or "Mayday,"* by signal or by voice.

3) Following each transmission with a 20-second dash so that the position could be plotted from direction-finding bearings.

4) Giving information on position, course, speed, altitude, nature of trouble, future intentions, and identification.

5) Tying down the transmitter key if a ditching or bail-out was inevitable, so that a continuing signal would be sent on which an accurate fix could be obtained.

Training. As air-sea rescue organizations grew in the United States, and in overseas areas as well, plans were made for training personnel to carry out the rescue mission. In March 1943, 40 AAF pilots were sent from the advanced flying school at Stockton, California to the Pensacola Naval Air Station in Florida for transition training in PBY aircraft.† The necessary orders were issued by Headquarters, AAF on 11 March 1943.[38] This group of 40 pilots formed the nucleus for three rescue detachments which served in the Mediterranean and the Southwest Pacific. The first detachment, originally composed of three crews, saw action in the summer and autumn of 1943 in the Mediterranean as a part of the XII Fighter Command Rescue Service; the second, also three crews, reached the Southwest Pacific in the late summer of 1943 and served with the Fifth Air Force Rescue Service; the third organization, the 1st Emergency Rescue

*A distress call first used by the British; a corruption of the French colloquialism "M'aidez," meaning "Help me."

†The Navy PBY was extensively used for rescue purposes, since it was amphibious and its slow speed made possible careful search of sea areas. The Army version of the PBY was designated the OA-10.

Squadron, was sent to the Mediterranean in 1944.[39]

Activation of the 1st Emergency Rescue Squadron took place at Boca Raton, Florida on 1 December 1943, in compliance with General Arnold's order that such a unit be trained and sent to the Mediterranean theater.[40] Training was conducted at that base until 18 February 1944, when the squadron began its overseas move. The training program, devised by Maj. Ernest S. Hensley and his staff, emphasized cross-country and night flying, water landings, instrument flying, and gunnery practice. Two British air-sea rescue instructors who were made available gave advice and lectures. Three operational missions, none of them successful, were flown for aircraft missing in the Caribbean. Training was hampered by the shortage of training aircraft; of the 11 PBY's available, 4 were unserviceable. The crew personnel were exceptionally capable, however; the navigators of the original seven crews, for example, were all former navigation instructors.[41]

The overseas success attained by these early crews spurred efforts to establish a rescue school with a fixed location, experienced teachers, and a planned curriculum. The opening of the AAF Air-Sea Rescue and Emergency Rescue School at Keesler Field, Mississippi, in the spring of 1944 fulfilled these objectives.[42] The school was under the Eastern Flying Training Command until July 1944, when control was transferred to the Western Technical Training Command. Authority for its administration and operation was delegated to Keesler Field. Personnel for the first group of instructors were obtained from surplus personnel of the 1st Emergency Rescue Squadron and from crews which had returned from overseas.[43]

Ground and air training was carried on concurrently through a five- or six-week period. All crew members received instruction in altitude adjustment, camouflage, use of emergency equipment, emergency landing procedures, ground gunnery, collection of intelligence, physical training and swimming, aircraft and naval recognition, seamanship, rescue techniques, and sanitation. Individuals were trained in the skills required for their particular jobs. Pilots, for instance, received 30 hours of instruction in the operation of their particular aircraft, the OA-10; 17 hours in the operation of communications equipment; 10 hours of navigation; 5 hours of weather problems; 4 hours of weights and balances; and 18 hours of instrument study. The co-pilot, navigator, engineer, radio operator and radar observer received similar intensive training for their particular jobs. During the course the crew flew over 100 hours on 20 practice missions averaging 5 hours in length. These exercises were designed to perfect crew performance in rescue missions and search procedures, both independently and in coordination with rescue boats.[44]

Lack of aircraft, maintenance problems, and uncertainty of requirements slowed down the training program. Less than half the airplanes needed for processing the desired number of crews were available.[45] This deficiency was further complicated by the unsatisfactory performance of the OA-10's used for flying training; water landings were almost impossible without damage to the aircraft. It was finally discovered that Canadian Vickers Limited, which manufactured the planes, had altered the original specifications by placing fewer stringers in the rear step. This could be corrected, but the nose section still remained weak.[46] In a desperate

attempt to secure seaworthy aircraft, the use of Navy PBY's was suggested, but no action was taken, and water landings were discontinued late in 1944.[47] Lack of a suitable landing area prevented the use of seaplanes for this phase of training, and, when approval was finally obtained for construction of a landing stage in 1945, postwar cutbacks caused the abandonment of the project.[48]

Meantime the idea of using B-17 airplanes equipped with rigid droppable lifeboats was beginning to be accepted with a consequent lessening of emphasis on both boat training and instruction of crews using amphibious aircraft. The use of B-17's with lifeboats was discussed during the summer of 1944, and training plans were made in September of that year. It was hoped that the first class of 12 crews would graduate on 15 October 1944. Although authorities at Keesler Field felt that there were not sufficient facilities available for such training, tests with the A-1 type airborne lifeboat were conducted there in September 1944.[49]

When it became evident, despite local objections, that the new rescue program would be taught at Keesler Field, requests were made for adequate lifeboats and parachute assemblies. By 18 December 1944, 13 airborne lifeboats were available, but lack of carbon dioxide chambers, necessary to the buoyancy of the lifeboats, caused further delay in completing the training of the first crews. Finally, in the last week of February 1945, the first group of B-17 crews, eight in number, completed their preparation for combat. Training of OA-10 crews still continued, and a group of 12 finished simultaneously with the graduation of the first B-17

crews. The two groups constituted the newly formed 6th Emergency Rescue Squadron.[50]

While air training was carried on at Keesler Field, boat rescue crews were receiving instruction at nearby Gulfport. Rescue boat crew training had been inaugurated at New Orleans by the 1007th Quartermaster Rescue Boat Overseas Training Unit under the Air Quartermaster. In the fall of 1943 responsibility for this training was shifted to the AAF and became part of the mission of the Training Command. The next spring the school was moved to Gulfport to become a part of the Emergency Rescue School.[51]

During the training period each prospective rescue boat crew member was instructed in a specific set of duties. Separate classes were held for masters, mates, chief engineers, oilers, boatswains, radio operators, surgical technicians, cooks, and able seamen. All crew members received 144 hours of instruction in the basic courses of seamanship, aircraft and ship recognition, rescue procedures, swimming, sanitation and decontamination, gunnery, and small boat handling. After 25 August 1944 training in smaller boats was discontinued because they could not be used for open sea rescue, and only type II (85-foot boats) and type III (63-foot boats) crews were trained. The personnel were then divided into crews--7 on the smaller boats, 13 on the larger and given operational training. Search operations, rescue procedure, and rendezvous missions, including joint operations with aircraft, were included in this phase. The training ended with a three- or four-day sea voyage.[52]

Boat crew training did not always run as smoothly as could be desired; maintenance problems in particular were present here as at Keesler Field.

There were 60 boats available by the first of September 1944, but approximately one-third were out of commission. The lack of a fueling ship made it impossible for the trainees to practice fueling at sea. Criticism of the training program itself was received from graudates, who felt that not all necessary skills were taught--for example, the transfer of personnel from a wrecked vessel to the shore--and that some of the training was unrealistic because it presupposed the use of specialized equipment often unavailable in combat areas. To remedy these and other faults, the school officials tried to obtain confidential intelligence reports of rescue activity overseas, but they were not successful.[53]

As a result of the interest in training crews for use with the B-17 equipped with a droppable lifeboat, boat-crew training was discontinued on 27 October 1944. During its short life the marine section of the Emergency Rescue School had trained a total of 95 crews.[54]

The increasing importance of air-sea rescue was reflected in its elevation to a position of first priority in Keesler Field activities on 4 January 1945.[55] Training progressed more smoothly thereafter, but the victories in Europe and Japan seemed to remove the need for continuance of the school. During the fall of 1945 training activities came to a standstill, and the Emergency Rescue School was findly disbanded on 22 April 1946.[56]

To mid-February 1945 the Emergency Rescue School had sent out four emergency rescue squadrons for overseas duty. In addition, 60 replacement OA-10 crews had been trained at Keesler Field, as well as other crews for the Air Transport Command.[57]

The history of the school is a replica in miniature of the record of air-sea rescue in all areas of activity. It began on a provisional basis as a minor part of the activity of a large training center, and grew without much forethought or planning. The personnel were uncertain as to what was expected of them, and were equipped with materials poorly suited to the task. By the time the importance of the school's work was recognized the immediate need for the product was dwindling.

Chapter III

THE EUROPEAN THEATER

When the first AAF units arrived in England in 1942, the British had a complete air-sea rescue organization which had saved over one-third of the airmen who ditched or bailed out over water in the last quarter of 1941. The same percentage of rescues was maintained through 1942.[1] The British organization had been developed since the outbreak of the war, although some use of rescue equipment dated back to the First World War. In that earlier conflict aircrews were issued lifebelts or other flotation equipment, but rescue was dependent on passing ships. In the 1920's British naval shipborne aircraft were equipped with some form of flotation gear, but the only RAF aircrews with rescue equipment were the flying-boat crews, who were provided with a triangular inflatable dinghy as early as 1925.[2]

Before 1935 there were marine rescue craft with limited operational ability at bombing and air gunnery ranges, but in that year British Air Staff approval was given to the building of an experimental high-speed launch. This boat when tested in 1936 proved successful, and 15 were ordered for use by the Coastal Command's general reconnaissance squadrons and at such points as Malta, Aden, Basra, Ceylon, Penang, and Hong Kong. From 1936 on flotation equipment for land planes and their crews was considered by the Air Staff, and in 1938 approval was obtained for storing some type of pneumatic dinghy in land planes that might be called upon for overwater flights.[3]

On specific occasions special arrangements were made to afford air-sea rescue protection. Thus in August 1938 and July-August 1939, when extensive home defense exercises were being held, special safety boats were supplied by the RAF and attendant destroyers by the Royal Navy (RN). Coastguardsmen were also instructed to keep special watch for aircraft distress signals during these maneuvers.[4]

Increasing concern over the possibility of a war which would entail long-distance flights over water led to the decision early in 1939 to place the whole high-speed launch organization in home waters under the control of Coastal Command. In addition 13 more high-speed launches were ordered. Just prior to the beginning of the war in July 1939 the Air Ministry issued amended instructions outlining the rescue responsibility of Coastal reconnaissance group commanders. Included in their mission was the co-ordination of aircraft and marine craft engaged in rescue, and the responsibility for calling upon high-speed launches and requesting naval assistance when necessary.[5]

In the early months of the war these peacetime rescue arrangements were continued. Aircraft down at sea were searched for by operational aircraft from their own units, and impromptu arrangements were made to direct surface craft to the rescue point if the downed airplane was located. Communication delays--the result of wartime security measures and congestion of the public telephone system--soon became a problem, however. A revised chain of communication system was therefore set up in March 1940. When a distressed aircraft broadcast an SOS or Mayday, the RAF station which received the signal transmitted a priority message to the Movements

Liaison Section of Fighter Command. The information was then passed on to naval authorities, the appropriate reconnaissance group of Coastal Command, and to the group distress area headquarters for action by air and marine craft.[6]

During the summer and autumn of 1940 the rescue of fighter pilots from the English Channel was a particularly difficult problem. "During the last 21 days of July over 220 aircrew were killed or missing, the majority over the sea."[7] In an attempted solution the RAF Fighter Command borrowed Lysander planes from the Army Co-operation Command and placed them under the operational control of Fighter Command. These planes were given a fighter escort and sent out after each air battle. Their chief rescue equipment was a rubber dinghy carried in the bomb rack. Although with close cooperation with the Royal Navy some success was achieved, it was felt that too many airmen were still being lost.[8]

After British air operations shifted to the interior of Europe, losses soared. Especially high losses in October 1940 prompted the Chief of Air Staff to propose a drastic reorganization and expansion of the sea rescue organization. Accordingly the Air/Sea Rescue Services was formed at a meeting held at the Air Ministry on 14 January 1941 under the chairmanship of the Deputy Chief of Air Staff and composed of representatives of the Royal Navy and of RAF operational commands. It was agreed that sea rescue of RAF personnel had become of such importance that it required the full-time attention of an air commodore (a rank equivalent to that of an American brigadier general) as director and a naval officer as deputy director. However, despite the important function of the new directorate,

no aircraft or aircrews could be spared specifically for rescue purposes, and the operation of the rescue service was to remain the responsibility of the operational commands.[9]

After the initial meeting, a period of several months passed in which the functions of the Directorate of Air/Sea Rescue were clarified and the organization completed. It was decided that the directorate was to be responsible directly to the Deputy Chief of Air Staff, but the director and his staff were to be attached to Coastal Command for close coordination with sea and air authorities concerned with search activities. In addition, officers of the directorate were to be attached to the area combined headquarters of Groups No. 15, 16, 18, and 19, whose functions were to control sea rescue activities and coordinate air and sea search. The British Isles were divided into four geographic areas coinciding with the regions of responsibility of the Coastal Command groups. Close-in search, to a distance of 20 miles from shore, became the responsibility of Fighter Command. It was also decided that the responsibilities of the Directorate of Air/Sea Rescue were to include:[10]

1) The coordination of all sea rescue operations for aircraft and aircrews.

2) The provision of ancillary equipment to be dropped by aircraft at the scene of distress to provide aircrews with a chance of survival until the arrival of the rescue craft.

3) The provision of adequate marine craft, moored buoys, and similar aids to rescue.

Through the Directorate of Operational Requirements, the Directorate of Air/Sea Rescue was also responsible for the "development, improvement,

and introduction of all life-saving equipment and safety devices for aircraft which might land at sea."[11]

In accord with its functions, the directorate interested itself in drop-survival equipment. In this category the Lindholme Dinghy Dropping Gear, the Thornaby Bag, the Bircham Barrel, and the Lysander Rescue Outfit were of particular importance. All of these contained food, water, distress signals, and first-aid kits. In addition, the Lindholme Outfit held a dinghy in one of its five parts. Visual and radio aids were other matters of constant concern. The difficulty of spotting an object as small as a man in a lifevest, or even a dinghy bearing several passengers, led to continuing search for better signalling equipment, more distinctive coloration, and more efficient communications apparatus. Pyrotechnic signals, signal torches, and whistles were among the devices perfected for attracting the attention of would-be rescuers. It was discovered that yellow was the color which contrasted to the greatest extent with the sea, and skull caps, life vests, and other items of rescue equipment were painted a glaring yellow. Fluorescine bags containing green sea dye became common articles of identification equipment. Balloons and kites were included in the dinghy equipment, and "K"-type dinghies were equipped with a telescopic mast and flag. The most important aid to location was the dinghy wireless set, but not until September 1941 were the first of these ready for trial. Meanwhile many multi-seater aircraft attempted to meet their needs by carrying a cage of homing pigeons to be released with a position report if no radio SOS was possible before a ditching.[12]

The directorate started to function with only 12 Lysanders available on temporary loan. Furthermore, the Deputy Chief of Air Staff had stated

at the time of formation that no aircraft could be made available for permanent assignment. However, the directorate continually emphasized the value of air-sea rescue in building morale and conserving manpower and finally convinced the Air Staff of the need for additional aircraft. Heavy losses of personnel in the sea, an average of 200 per month during 1941, was probably the deciding factor. Accordingly, in May 1941 the Lysanders were transferred to the complete control of Fighter Command and six more were added to the total. In September this number was further increased to a total of 36 aircraft divided into 4 squadrons. The recommendations concerning the need for amphibious aircraft were also finally accorded recognition, and in July 1941 three Walruses were authorized for use as rescue aircraft. The following month six more were obtained. These additional aircraft were assigned to the four squadrons which became composite units designated as Air/Sea Rescue Squadrons Nos. 275, 276, 277, and 278.[13]

Until late in 1941 operations of the Air/Sea Rescue Services were restricted to an area within 20 miles of the English coast. Search beyond this point, known as deep search, was handled by those aircraft which could be spared from operational missions. The loss of time involved and the uncertainty of having enough search aircraft reduced the efficiency of deep search below that which prevailed within the Air/Sea Rescue Services' sphere of operational responsibility. In September 1941 the allocation of enough long-range aircraft to form two squadrons was approved by an Air Staff conference, but previous commitments for the delivery of this type of plane made the immediate implementation of this decision impossible. By October, however, it was decided that enough Hudsons were available for

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the formation of one deep search squadron, and a second was authorized in November. Continued shortages of aircraft, however, prevented the quick entry of these new squadrons (Nos. 279 and 280) into rescue work. The first did not become fully operational until March 1942, and No. 280 flew no missions until June of the same year.[14]

One logical way to rescue aircrews in the sea far from their home base was to provide them with the means of self-rescue. The most practicable equipment for this purpose seemed to be a self-propelling marine craft that would be carried to the scene by a rescue plane and dropped to the survivors. As early as 1940 a glider-type boat had been visualized, but its construction involved technical problems too difficult to solve. In the same year plans for a 32-foot motor dinghy were also abandoned, although a great deal of experimentation and discussion had gone into them. Finally, in January 1942 preparations were begun for the production of a 20-foot wooden boat fitted with sails, oars, and a motor to be carried under the fuselage of a Hudson aircraft and dropped by parachute. The possibility of capsizing was eliminated by the installation of buoyancy chambers, inflated by carbon-dioxide bottles whose caps were "triggered" by the opening parachutes. To aid the distressed crew in finding and reaching the boat, a rocket which would fire on contact with the sea was placed on either side. Each rocket carried 200 feet of buoyant line which the survivors could seize and thus get aboard. The lifeboat was fitted with a rocket-fired sea anchor to keep it from floating away from the survivors. Production of 24 of these boats was authorized in November 1942.[15]

Communication between rescue aircraft and rescue boats was made easier by the authorization of the two Hudson deep search squadrons. Adequate communication between aircraft and boat was impossible when operational aircraft with varying radio frequencies were used. The decision was therefore reached in September 1941 to equip all rescue craft, air and sea, with VHF radio sets and high frequency radio telephone (HF/RT). Barring static, communication was direct and instantaneous.[16]

After studying requirements for rescue boats, the Directorate of Air/Sea Rescue in 1941 concluded that there were two major requisites: boats capable of low-speed prolonged cruising, but with an available speed of 25 knots; and high-speed boats capable of rough sea operation. It was considered necessary that these boats, designed for open-sea operation, be 60 feet or more in length, although 40-foot seaplane tenders could be used close to shore. The difficulty of combining high speed and seaworthiness finally led to the conclusion that the first should be sacrificed in order to attain the second. Efforts to obtain boats for rescue service met with the same difficulties of equipment shortages as those concerning aircraft, but by 1942 more than 150 sea rescue boats--high-speed launches, seaplane tenders and RAF pinnaces--were available for rescue operations.[17]

Crew survival, dependent on knowledge and practice of proper ditching and escape procedure, was a major concern of Air/Sea Rescue Service. A syllabus was accordingly prepared, pamphlets issued, lectures given, and practice encouraged.[18]

The RAF, and later the AAF, benefitted from observation of German equipment. The German rescue service perfected a one-man dinghy before it was a feature of British fighter planes. They were the first to use

fluorescine as a sea coloring to aid searchers in finding downed airmen, and the first to discover that yellow was the best color for sea-rescue equipment. In the fall of 1940 German sea rescue floats began to appear in the English Channel. These had bunks for four men, blankets, food, water and distress signals. The RAF copied the example.[19]

Through the autumn of 1941 and the year of 1942 British air-sea rescue was able to save more than a third of those who ditched or bailed out over water. In the fourth quarter of 1941, 160 out of 473 aircrew members, or 33.8 per cent, were saved; in the same period in 1942, there were 205 out of 568, or 36 per cent.[20]

When United States air units arrived in England in 1942, the British had completed their air-sea rescue organization. There were air-sea rescue liaison officers at each area combined headquarters, Coastal Command headquarters, and Fighter Command headquarters. Fighter Command was responsible for the area within 40 miles of the English coast, and provided planes for search in its zone and fighter cover for search planes and rescue craft. Coastal Command covered all other areas, detailed a flying-control officer in each area combined headquarters to initiate air-sea rescue action, provided planes for extended search, maintained liaison with the Royal Navy, and coordinated all activities not under the direct jurisdiction of Fighter Command. Any RAF operational group could be called on for assistance. For instance, Bomber Command might provide long-range planes, and naval surface craft often participated in search and rescue.[21]

British air-sea rescue control techniques were also well developed by August 1942, when the first AAF heavy bombing mission was flown. Communication procedure was standardized and fixer stations and central rooms were in operation. When a distress signal was received at a fixer station, the position was plotted and the information phoned to the control staff of the nearest area combined headquarters, which in turn notified the controller of the group in whose area the plane had fallen. The controller informed the nearest Coastal Command station, and a reconnaissance plane was immediately dispatched (Fighter planes known as "spotters" were often used for this purpose). In addition, the area combined headquarters notified the nearest naval station at which rescue boats were based. These put to sea and were directed to the survivors by the reconnaissance plane if and when the survivors were found. Besides leading rescue boats to the scene, the spotter plane dropped emergency supplies and a dinghy to the downed crews, and circled them constantly to insure that their position would not be lost. If rescue craft were not able to reach the survivors immediately, relays of planes might relieve each other, and, if the delay was prolonged, drop further supplies.[22]

For nearly a year AAF planes used the facilities of the British Air/Sea Rescue Services. During that time individual groups used some of their own equipment, but the emphasis within the AAF was on escape and survival rather than rescue. Some groups devised ditching procedures and modified equipment, but in general they did not know enough about the job to do it well.[23]

AAF Air-Sea Rescue

Early lack of action. The RAF Air/Sea Rescue Services suggested in November 1942 that one senior officer in each command of the American Eighth Air Force be appointed a full time air-sea rescue officer. His duties would include liaison with the RAF, and RN and American combat units; responsibility for equipment; and the dissemination of air-sea rescue information. In addition, it was recommended that each AAF station have a part-time air-sea rescue officer, and that a small central controlling agency be established at Eighth Air Force headquarters. To assist in their orientation, the RAF offered to open their Air/Sea Rescue School to selected Eighth Air Force officers.[24]

In January 1943 a conference was held to discuss the suggested plan, but because of the shortage of AAF officers, it was not adopted. Instead, air-sea rescue was assigned as an additional duty to the flight-control officers of the Eighth Air Force. The RAF representative predicted failure for this solution, and his forecast proved to be accurate. Air-sea rescue was too large and complicated a task to be assigned as part-time duty to an officer who was usually not rated and who had no agency available to maintain liaison, disseminate information, inspect equipment, set up procedures, and carry on all other necessary functions. In view of the lives still being lost, the office of the Eighth Air Force Surgeon recommended in March 1943 that the RAF's proposals for American air-sea rescue be adopted, that our air-sea rescue officers be sent to the RAF school, and that appropriate training of combat crews begin at once.[25]

Establishment of an AAF air-sea rescue service. Not until June 1943, however, was a move made toward establishing an American air-sea rescue service. In that month the first American air-sea rescue fixer net, copying similar RAF installations, was laid out with a triangulation table in the sector operations room of the RAF 11 Group. Whenever an aircraft gave a distress signal or requested information on its location, three fixer stations read the bearing from which they received the signal. The reading was passed on to the triangulation room where a string was pulled across the map for each bearing given. The intersection of the strings indicated the position of the aircraft. The position thus determined was passed on to the air-sea rescue control room where the fix was plotted and the pilot informed of his position; if it were a distress call, rescue facilities were dispatched to begin the search and, if possible, to complete the rescue. When the 4th Air Defense Wing (later the 65th Fighter Wing), arrived in England, it was trained by the RAF at Saffron Walden, a small Essex town, for its future duty of carrying on American sea rescue operations.[26]

By 14 June American air-sea rescue control was in partial operation. On 15 June, at 0845, a fighter pilot of the 4th Fighter Group was located by American rescue controllers and picked up within an hour by a British Walrus. On 4 July training of AAF personnel in sufficient numbers to operate an entire rescue-control system was completed. The first AAF mission with air-sea rescue control facilities serviced entirely by American personnel was flown on that day.[27]

Inauguration of "spotter" service. American air-sea rescue expanded continually; by autumn of 1943 there were 11 fixer stations in the U.S. network, and in the late months of 1943 the "spotter" technique for

locating downed aircraft was initiated. This method, first developed by the RAF, consisted of dispatching fighter planes as soon as a ditching was reported. These could reach the scene quickly, and if successful in locating the survivors, hover over them while reporting their location to the slower rescue aircraft and boats. Besides aiding in location of the survivors and raising morale by their presence, the spotter planes carried dinghies and flares which they could drop to the stricken aircrew. Spotter planes were sometimes not available, however, because they were supplied by operational units, and it was soon realized that a specialized organization was needed for this purpose.

Other problems became apparent in the autumn of 1943. Communication facilities were faulty, especially those used with surface rescue craft. Requests for RAF and RN boats had to be made through regular channels, and telephone lines were overloaded. The installation of VHF radios in all American bombers early in 1944 made possible the use of a common rescue frequency for all aircraft, but only certain channels within the frequency were available and some of these had to be used jointly by AAF and RAF. Occasional jurisdictional disputes among RAF coastal agencies were another cause of delay. An additional problem was that of obtaining sufficient emergency equipment.[28]

A conference was held at the Air Ministry on 8 May 1944, at which these problems were discussed, and representatives of the AAF and RAF were able to reach amicable agreement on several fundamental points. An independent AAF air-sea rescue spotter squadron equipped with 42 P-47's was established, and direct radio contact from AAF units to RAF and RN surface craft was

arranged. The problem of emergency equipment was partially solved by the RAF's promise to "do as much as possible" to furnish such items as dinghies, floats, and flares. Two squadrons of Warwicks equipped with airborne lifeboats were also to be fitted with communications equipment, allowing control by AAF air-sea rescue headquarters at Saffron Walden. A new use of surface ships for rescue work was implicit in the decision to position RAF and RN boats at certain rendezvous points and direct distressed aircraft toward these areas.[29]

The spotter squadron (Detachment B, Flight Section, Headquarters, 65th Fighter Wing) began operations the next day. At first only 25 "war-weary" planes were available. The 20 officers on temporary duty and 90-odd enlisted men on detached service found that their organization had no hangar and very little equipment. Fortunately, the American soldier's traditional energy and determination to overcome obstacles prevailed--tools were borrowed, a hangar built, and other necessary facilities obtained.[30]

Experiments with equipment for the spotter planes finally resulted in mounting dinghy packs under each wing, adding a belly gasoline tank, and attaching smoke bombs to the fuselage behind the extra tank. Thus equipped, the P-47's could fly for five hours, drop smoke bombs as markers, and aid aircrews in distress by releasing the rescue dinghies.[31]

The squadron's mission, as its personnel understood it, was a fourfold one:[32] to intercept aircraft in distress while in the air and lead them to land or to the nearest boat; to locate downed aircraft; to maintain contact, act as the eyes of the controller, and relay information; and to escort the heavier rescue aircraft.

The P-47 pilots early learned the difficulties of spotting an object the size of a life raft, even a large one, in the sea. Slow speed and low altitude were recognized as prime necessities for successful search. However, since VHF communication follows a straight line and does not bend with the earth, maintaining radio contact was difficult at low altitudes. This difficulty was often surmounted by hunting in pairs, with one plane near the water and one high to maintain contact. Search patterns were established, each of which was adapted to a different set of circumstances--the number of search planes available, the weather, and the accuracy of the radio fix or other position determinant. The most satisfactory pattern was the "square," but this required a number of planes, each assigned to one particular search area, clear weather, a maximum of navigational efficiency, and knowledge of the ditching position. If only one or two planes were available and the point at which the plane entered the sea was not definitely known, the search plane(s) followed its probable path, flying back and forth in a series of adjacent oblong figures. If the point of ditching was not known, and a sufficient number of planes were available, the search was carried on by several planes flying parallel to each other along the probable path of the distressed plane. The importance of searching all of a fixed area before going on to another was impressed on all personnel.[33]

Two functions of spotter aircraft--search and protection of other rescue craft--were illustrated in an incident of 29 June 1944. On that date a man in a dinghy was reported 10 miles west of the Hook of Holland. A British Warwick with an airborne lifeboat, accompanied by two AAF P-47's,

was dispatched in search of him. The Warwick was hit by antiaircraft fire near the enemy coast, but the P-47's continued on, spotted the survivor, and radioed the location. Two Air/Sea Rescue Service Hudsons with two more P-47's were then dispatched. A high-speed launch reached the scene, and more P-47's arrived to give additional cover. The dinghy occupant, an Australian fighter pilot, was finally rescued after 7 hours of effort involving 15 aircraft.[34]

The introduction of rendezvous points was another aid to rescue operations. Boats were positioned out in the sea at certain points selected by air-sea rescue control. These positions were marked on the control board, and planes in distress were, whenever possible, directed to a rendezvous point, a method which often considerably shortened the length of time that crews were forced to spend in the water. On one occasion a plane was successfully ditched so near the rescue launch that the crew "walked from the bomber's wing into an HSL [high-speed launch] without getting their feet wet."[35]

Control of air-sea rescue from England continued after the invasion of France in June 1944 since heavy bombardment missions were still being flown on the northern route crossing the Channel. The most important changes resulting from the invasion were that planes in distress could be directed to land at continental fields, and the decreasing frequency of enemy fighter action over the Channel.[36]

The 5th Emergency Rescue Squadron. Early in 1945 Detachment B was redesignated the 5th Emergency Rescue Squadron. The new organization was equipped with P-47's, OA-10's, and B-17's with airborne lifeboats.[37] The

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OA-10's were immediately pressed into use. One of them was directed to attempt a difficult rescue on the day of its arrival, although it was flying an indoctrination flight along the English coast.[38]

> . . . a bomber ditched near Holland, and the controller knew the Catalina /OA-10/ was the crew's only hope before dark. So away lumbered the big flying boat to the east.
>
> The crew spotted eight men in two dinghies, tossing in ten-foot seas. A ningh man was struggling desperately to reach one of the rafts. Unhesitatingly the young pilot of the OA-10 set her down. They couldn't get to the ninth man in time, but they rescued the other eight.
>
> Overloaded, the ship crashed through the waves and into the air, water pouring into the nose through a bashed-in part, knocking the crew down like a stream from a fire hose. The water also shorted out the radio. They had no map extending that far east, but the navigator took them back with a homemade chart, and the pilot made the first night landing he had ever made in England, successfully settling into Halesworth on the third attempt.

On 23 February 1945 another incident involving an OA-10 demonstrated the speed with which rescue operations could be accomplished with this type of plane. Three men in a dinghy were sighted in the late afternoon by a bomber returning from a daylight raid. The distressed men were 18 miles from the English coast, and the nearest rescue launch was 7 hours away. An OA-10 was assigned the mission, landed beside the survivors just at dark, made the pickup, and brought the rescued men back to Halesworth. "In no other way could these men have been spared a dangerous night on the winter sea."[39]

The first operational drop of an AAF airborne lifeboat in any theater was made in the North Sea in the first week of April 1945. Six men in a dinghy were sighted, and RAF planes on patrol in the area tried three times to drop lifeboats to them. The boats were either blown away by the 50-knot wind or demolished by the rough seas. A 5th Emergency Rescue Squadron

B-17 was thereupon called and succeeded in dropping its lifeboat, enabling the rescue to be satisfactorily completed.[40]

By 8 April 1945 the 5th Squadron was sufficiently oriented to assume all rescue responsibility for Eighth Air Force operations and to lend a hand when called on by the RAF.[41] Typical rescue procedure included the following steps:[42]

1. Preliminary arrangements for which air-sea rescue control personnel were responsible.

a. Determination of bomber and fighter overwater routes from the field order, decisions on rescue boat positions, spotter squadron assignments, and OA-10 patrol areas.

b. Informing rescue launch bases and aircraft rescue squadron of their assignments. Launches required three hours' notice, aircraft one hour.

c. Clearance of all air-sea rescue flights with proper headquarters, alert of all fixer stations, arrangements for radio and airborne relays (aircraft stationed along route to pass on messages).

d. Coordination of AAF with RAF mission if the latter was scheduled.

2. When emergency occurred.

a. Pilot sent distress signal.

b. Direction-finding stations took bearings on distress transmission and called the bearings in to the triangulation room, where the position was determined.

c. The position, or fix, was plotted on a chart of the area; the course to the nearest rescue launch or point of land was determined and transmitted to the distressed pilot.

d. Simultaneously, rescue launches and aircraft were alerted. Their respective bases were also warned that additional rescue craft might be needed.

e. Spotter planes were directed to the distressed aircraft while the control center maintained contact with the pilot, following his course constantly by radio fix and dead reckoning.

3. When bail-out or ditching occurred.

a. Control center continued to maintain fix and directed spotter planes to position.

b. Spotter planes (one high for control on fixing, one low to keep dinghy in sight) obtained call sign and location of nearest launch and called nearest boat to the scene.

c. Launch completed rescue, gave aircrew dry clothing, rubdown, hot drink, and first aid, notified control center of rescue, and transmitted crew's names, condition, and time of arrival in harbor.

d. Spotter planes relayed above information and returned to original assigned positions.

e. Control center informed rescued crew's base and arranged for transportation when crew reached land.

Instead of rescue launches, OA-10's or B-17's might be used if time or distance was a factor to be considered. The decision on which of the two to call for the rescue was influenced by their availability and wind

and sea conditions. If the weather made an OA-10 landing impossible, the choice fell on the B-17.

Training defects. The omission of instruction in ditching procedure, use of emergency equipment, and rescue techniques was a serious defect in the training of AAF crews. There were many illustrations in action of these defects, but the following are sufficient to indicate their serious consequences.[43]

> A Fortress returning from a bombing raid on Germany [4 March 1943] was engaged by enemy aircraft. In the ensuing action three engines and the radio were put out of action. The aircraft proceeded on its course, losing height rapidly, and at 5,000 feet the pilot decided that a ditching was imminent. No S.O.S. could be transmitted as the wireless was out of order. The pilot and second pilot remained in their flying positions, the eight remaining members of the crew taking up positions in the radio room. On ditching the aircraft broke immediately into four pieces but all ten members of the crew managed to get out of the wreckage. The dinghies floated out and attempts were made to inflate them. As these had not been stowed in their official stowage but had been wrapped in string and carried loose in the fuselage, great difficulty was experienced in inflating them and in the thirty minutes before the first one could be inflated three members of the crew were drowned although they all wore Mae Wests.
>
> One man saw an object floating in the sea and grabbed hold of it to give himself buoyancy. All seven surviving members of the crew managed to get aboard the first dinghy whilst the second one was being inflated and it was then found that the floating object was the dinghy radio. Although no one had any previous experience of this transmitter they managed to launch the kite aerial and an S.O.S. was automatically transmitted. A fix was made on this S.O.S. and six hours later search aircraft sighted the distressed crew and dropped a Lindholme gear to them. This they managed to reach and availed themselves of the comforts and pyrotechnics in the containers. Two hours later they were rescued by a minesweeper diverted for the purpose.
>
> Subsequent interrogation revealed that no dinghy drill had ever been carried out in their squadron and although some of the crew remembered seeing the dinghy drill and diagram

> for a B-17 they had never taken the trouble to study it. Their faulty ditching procedure caused them to land into the swell instead of across the top and parallel to it and it was miraculous that none of the crew was drowned in the resultant break up of the aircraft.

An example of ignorance of correct rescue procedure was afforded by the following incident which occurred in January 1943:[44]

> A United States crew returning from a flight over the sea sighted two men afloat in a dinghy a few miles off the English coast. They obtained no fix when over the dinghy and only after landing passed the information on to the rescue services. A search plane was dispatched on the general directions obtained from the United States crew but failed to return, resulting in the loss of the two men in the dinghy as well as the rescue plane and its crew.

In view of the accelerated pace of aircrew training in the early years of the war these training defects were understandable if regrettable. As early as 20 March 1942, however, General Eaker mentioned the necessity for training in air-sea rescue procedures in his initial report to AAF Headquarters.[45] By June of that year an Eighth Air Force training syllabus on the subject had been prepared, and on 15 September all commands of the Eighth Air Force were instructed to familiarize their crews with rescue procedure and channels of communication. Station air-sea rescue officers were made responsible for this instruction. As is so often the case, however, fulfillment of these directives by lower echelons of command was far from complete.[46]

Besides the unsatisfactory manner in which these orders were handled, two other factors hampered training in rescue procedure. One was the previous training of all AAF crews, which emphasized bailing out whenever their aircraft was in distress; the other was the poor ditching qualities of AAF planes. They not only sank rapidly, but they were poorly equipped

with escape facilities, the emergency equipment was not standardized, and there was no provision for standard stowage. Dinghies were carried in most planes, but ejected manually rather than automatically, and other equipment, such as the dinghy radio, was stowed separately and had to be taken from the aircraft by the aircrew.[47]

During the spring of 1943 a training drive in rescue procedure was carried on in the Eighth Air Force. Some standardization of equipment was also achieved through extensive loans of British equipment. As a result of these and other factors rescue figures for AAF crews began to improve in the summer of 1943. In June 71 of 255 were saved, and in July 139 out of 196. Included among these was the remarkable total of 78 out of 80 on 25 July.[48] From July to December 1943 nearly 40 per cent were saved, as compared with only 6 per cent for the first half of the year.[49]

Conclusion and recommendations. Although the AAF air-sea rescue organization in England had the advantage of British experience, a process of trial and error was followed before efficiency of operations and control was achieved. By 1945 the personnel were able to evaluate their experiences and draw conclusions which were included in the official history of air-sea rescue activities in the Eighth Air Force:[50]

1. Time was of primary importance in rescue work. When an aircraft was in distress, the delay in coding and decoding distress messages meant the difference between life and death; transmission "in the clear" was therefore essential. The same element--time--made it vital that the rescue organization have the fastest planes and ships available and be located as close to the battle area as possible.

2. Single control for any rescue operation was another essential. Attempted coordination by two or more controllers often caused confusion; it always created delay. For most efficient operation centralized administration and operational control of rescue units was mandatory.

3. To achieve maximum results, air-sea rescue should be included in premission planning, not called in only when trouble was encountered. Routes affording maximum rescue possibilities could then be chosen, and facilities used more efficiently.

4. Rescue personnel had to be superbly trained in their jobs, since the equipment needed expert maintenance and had to be handled with skill. Communications were particularly important. The fastest rescue aircraft could not reach a rescue scene in time if communication facilities were for any reason inefficient.

5. Rescue personnel had to be cooperation minded. No matter how large the rescue organization, other agencies could render assistance on countless occasions.

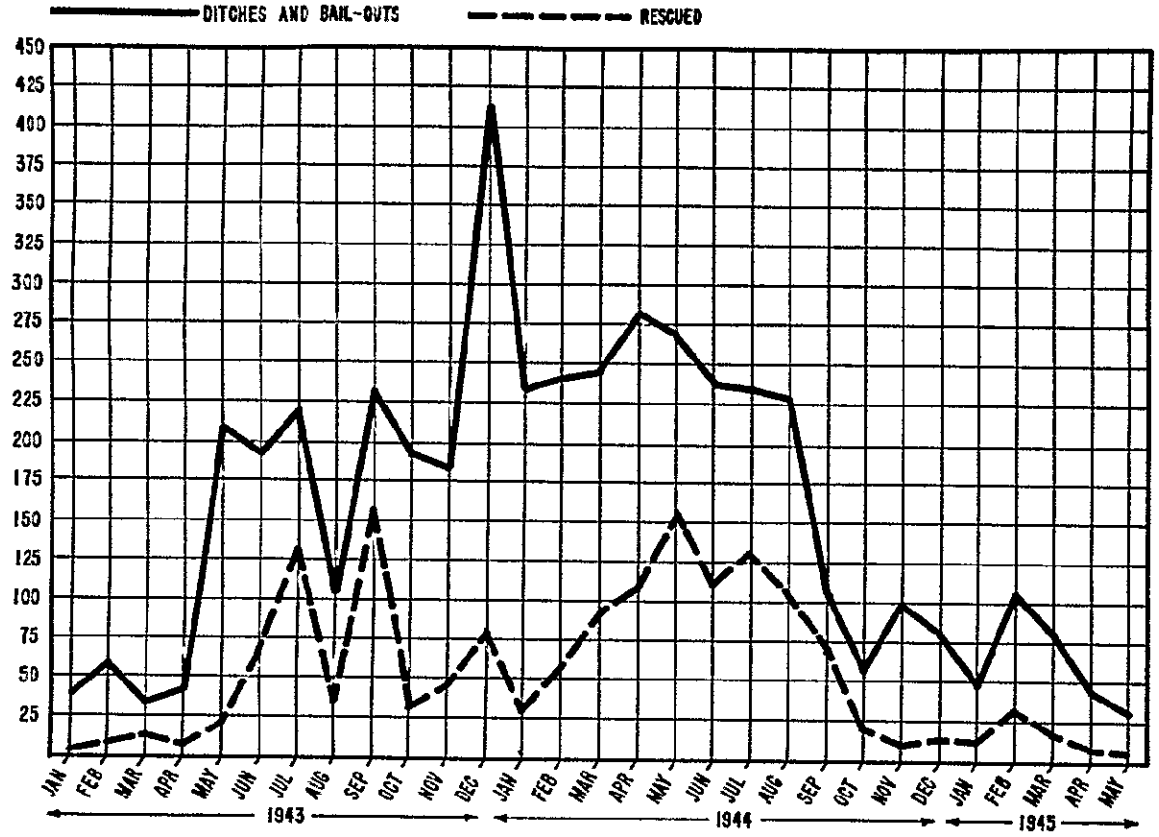
6. Only part of the job could be accomplished by rescue personnel. The responsibility fell with equal weight on those in distress. Intensive training in ditching and bail-out procedures was needed to allow members of the aircrew to act instinctively. Knowledge of the required techniques, of when to ditch and when to bail out, of the methods of escape from various types of aircraft, and of the emergency equipment and its uses could only be gained through training and practice.

The achievements of air-sea rescue in the Eighth Air Force are illustrated by the accompanying graphs. The most significant fact is that by late 1943 flying personnel had better than a one-in-three chance of survival if they were forced to descend to a watery landing.

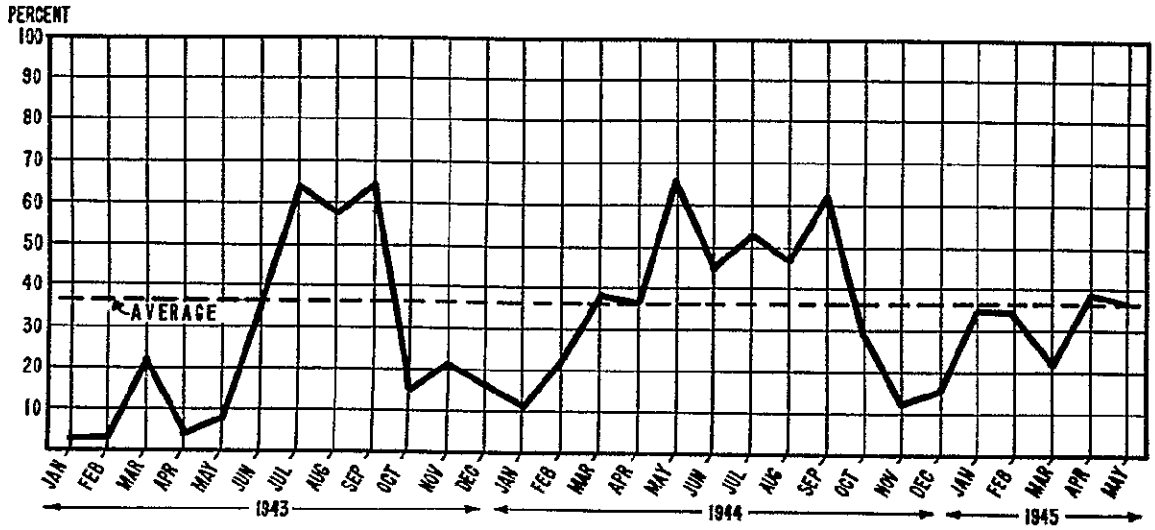
EIGHTH AIR FORCE

JANUARY 1943 - MAY 1945

NUMBER OF DITCHES AND BAIL-OUTS AND NUMBER RESCUED



PERCENT OF PERSONNEL RESCUED



SOURCE HQ. EIGHTH AIR FORCE, STAT SUMMARY OF EIGHTH AIR FORCE OPERATIONS, 1 MAY 1942 - 8 MAY 1945, P 54 PRIOR TO MAR 1944, DATA INCLUDES ALL U.K. PERSONNEL INVOLVED AND CREWS OF ANTI-SUB OR OTHER PERSONNEL INVOLVED.

Chapter IV

THE MEDITERRANEAN THEATER

Introduction. In the Mediterranean the British and American air forces were included in one over-all command system, which took final shape as the Mediterranean Allied Air Forces (MAAF) in the beginning of 1944.[1] Air-sea rescue in the theater was a part of this joint action. British rescue organizations were active before the American landing in North Africa in 1942, and they were continuously present until the last stages of the war. American rescue units, activated in 1943 and 1944, operated as a part of the larger British organization.

The story of air-sea rescue in the Mediterranean would be misleading unless emphasis were placed upon the greater importance of the British contribution. After February 1943, there were always British units affording rescue cover for Allied aircraft operating over the Mediterranean, Adriatic, and Aegean seas. In contrast, AAF units were active only from June to December 1943, and from April 1944 to the end of the war. From December 1943 to April 1944 the sole rescue cover was that provided by the RAF. If it be recalled that the amphibious landings at Anzio occurred during this period, the importance of the British rescue organization becomes apparent. In the Sicily and Salerno landings, which called forth 25,000 and 29,000 support sorties respectively by Allied aircraft, some AAF air-sea rescue help was available, but for the landings at Anzio, when 54,000 sorties were flown, the only rescue effort was that provided by the British.[2] Further, the British had four air-sea rescue squadrons

in the Mediterranean by 1944, as well as a number of rescue units equipped with high-speed launches and pinnaces.[3] The AAF, on the other hand, had only a detachment of three planes during 1943, and AAF air-sea rescue facilities never exceeded one squadron and four boat crews.

British Air-Sea Rescue

The British paid little attention to air-sea rescue in the Mediterranean during the first year of the war (1939-1940), but the Italian attack on France in June 1940 drew attention to the desirability of rescue facilities. However, the need for aircraft and boats in British homewaters made the development of air-sea rescue organizations in other parts of the world a difficult task.

The first air-sea rescue unit in the Mediterranean area was authorized in August 1941 when an air-sea rescue flight attached to No. 201 Group was formed, becoming operational in September. This flight, under Middle East Command (MEC), was based at various North African points, depending on the fortunes of British armies in their desert campaigns. At one time (9 January 1942) they were as far west at Tobruk, but as the ground situation deteriorated they were forced to fall back. Their original equipment, consisting of three aircraft and seven launches, was augmented by six more aircraft and an equal number of launches in August, September, and October of 1942. In November 1941, an air-sea rescue unit with three high-speed launches was formed at Malta. By the following November the number of launches had been increased considerably, and more arrived in the following months.[4]

In February 1943 a British air-sea rescue unit was formed in north Africa to provide rescue cover for the western Mediterranean area. Designated as No. 283 Air/Sea Rescue Squadron, this organization was equipped with six amphibious aircraft and four launches. Besides this group a number of air-sea rescue units, each consisting of two launches with their crews, were stationed at various points throughout the Mediterranean during 1943. By July of that year there were 32 of these units with a total strength of 55 boats (43 launches and 12 pinnaces). In addition, rescue activities were supplemented by combat aircraft when they could be spared, and naval assistance if it was available.[5]

In 1944 the British had four air-sea rescue squadrons in the Mediterranean--three under MAAF, and one under MEC. The squadrons of the Mediterranean command were all equipped with Warwick aircraft (with the airborne lifeboat), but in the Middle East similar aircraft were not received until September 1944. Amphibious aircraft were still retained in each squadron, fortunately, since no successful lifeboat drop was completed during the entire year of 1944. Forty-five high-speed launches were in MAAF's possession and MEC had 21. Early in 1944, 68-foot launches, larger than those previously used, began to arrive. Their extra range and greater seaworthiness made them distinctly preferable to the older boats.[6]

AAF Air-Sea Rescue

OA-10 detachment. Although AAF aircrews were initially dependent upon the British organization for rescue service, an AAF air-sea rescue unit of three planes was formed in June 1943. Operational control of the detachment was placed in the British rescue organization.[7] No other AAF flying rescue organization was present in the Mediterranean until the arrival of the 1st

Emergency Rescue Squadron at Casablanca on 12 March 1944. The squadron was assigned to the XII Fighter Command, but its operations were coordinated with those of British air-sea rescue units.[8] Besides the facilities afforded by these two AAF units, there were quartermaster (later AAF) boat crews in action from August 1943.[9]

The first AAF rescue detachment mentioned above was the result of efforts by XII Fighter Command to activate American air-sea rescue units to augment British rescue activities. Three OA-10 pilots were finally obtained from among those in training at Pensacola, and old amphibious training planes (OA-10's) were ferried from the United States. Air Transport Command pilots flew the ships, originally five in number, to Malta by way of South America and west Africa. Only three arrived, since one was damaged at Puerto Rico, and one landed in Spanish Morocco, where the crew was interned. The crews and planes were assigned to Headquarters, XII Fighter Command, but placed under the operational control of RAF Group No. 242 based at Malta. Since there were no other OA-10's on Malta, maintenance suffered, and the detachment was transferred to Bizerte, Tunisia. Even at that base, however, spare parts were hard to obtain, and the U.S. naval air station at Port Lyautey, in French Morocco, was often appealed to for assistance. Because the planes were old, and were further abused by the inexpert handling of the pilots, it was difficult to keep them in operation. It was found necessary to ground a plane after each open-sea landing to replace rivets, sheet metal, and plexiglass damaged or broken in the landing.[10]

American interest in air-sea rescue was increased with the July 1943 landings in Sicily. A squadron-type organization was built around

the OA-10 crews at Bizerte, gathering personnel and equipment from "any and every possible source." Although the RAF, with its high-speed launches and Walrus squadrons, carried the heaviest burden of rescue responsibility during the invasion, the AAF unit rescued 40 Allied and 5 Axis airmen during July and August 1943. In the course of these operations 11 open-sea landings were effected, and almost 200 hours were flown.[11]

Despite their lack of thorough training in rescue techniques, the antiquated nature of their aircraft, and the absence of formal organization, the personnel of the AAF detachment demonstrated a zeal in the performance of their duty that is worthy of comment. Two successful rescue incidents were outstanding. On 30 July 1943 an OA-10 was guided by a circling Wellington to a dinghy containing five men of a B-26 crew. The landing and rescue was accomplished, but the rescue plane was so badly damaged in the landing that a take-off was possible only after crew members had for eight hours on their plane. On 18 August there was a similar incident involving the pickup of 20 airmen, survivors of 2 B-17 crews. On this occasion the landing damage could not be repaired, and the pilot elected to taxi to port. High-speed launches eventually removed the passengers and towed the OA-10 to land.[12]

The loss of two aircraft from enemy action, one strafed while in the water in the act of attempting a rescue, and the other shot down by enemy aircraft while on a mission, was another indication of the rescue crews' devotion to duty.[13] Flying slow, clumsy aircraft that were usually damaged in an open-sea landing, they did not hesitate to land whenever necessary to effect a rescue.

This original unit continued activities in the Mediterranean through the fall of 1943. Its last operational mission, after which the flight crews returned to the United States, was on 13 December 1943.[14] From December 1943 until the 1st Emergency Rescue Squadron arrived in March 1944, there was no AAF rescue unit equipped with planes in the Mediterranean.

The 1st Emergency Rescue Squadron. The 1st Emergency Rescue Squadron, commanded by Lt. Col. Littleton J. Pardue, consisted of 52 officers and 147 enlisted men assigned to 3 operational flights (A, B, and C), and 1 headquarters flight. They were issued nine OA-10 aircraft and six other planes. Arriving in Casablanca on 12 March 1944, the squadron on 1 April began its move to Ajaccio, Corsica, from which it flew its first overseas mission. Early in May Flights A and B were moved to Grottaglie and Foggia, Italy, to give rescue cover to Allied bombers flying across the Adriatic. Flight C remained at Ajaccio. Flight A was then brought back to Corsica to provide rescue cover for the invasion of southern France, Flight B remaining in Italy to cover diversionary operations. On 12 October Flight A was transferred to Cuers, France. Headquarters of the squadron was later transferred to Foggia, and Flight B to Falconara.[15]

On 1 January 1945 the squadron received word that two of the three flights were to be sent to India, and the following day a squadron operations order to that effect was issued. By 8 January all personnel and planes destined for India had departed, with the exception of four B-17's and their crews. All that remained of the squadron was Flight B at Falconara and squadron headquarters at Foggia.[16] The squadron's quiescence after that time was well described by its historian in his report for January 1945:[17]

> Very, very quiet. Absolutely no action at any place. At Falconara just a skeleton organization holding a base for further operations; they have no planes at all. Here at Foggia we have five planes, no activity, plenty of personnel, but no aircraft.

On 20 February 1945 the 1st Emergency Rescue Squadron was reorganized. The unit retained its original designation, but only two flights, A and B, plus a headquarters flight, were authorized. The revised organization was allotted 51 officers and 174 enlisted men under the provisions of T/O and E 1-987. Headquarters and Flight B were located in Foggia, and Flight A operated from Falconara.[18]

The principal rescue aircraft used by the 1st Emergency Rescue Squadron was the OA-10, although a few L-5's (liaison aircraft) and B-25's (medium bombers) were also assigned. Late in 1944, four B-17's equipped to carry lifeboats were assigned, but since no lifeboats were ever available as long as those planes remained with the squadron, their use was limited. On 1 March 1945 these B-17's departed with their crews for India and assignment to the newly constituted 7th Emergency Rescue Squadron.[19]

Emergency rescue boat crews. Quartermaster emergency rescue (ER) boat crews (later redesignated as AAF ER boat crews) began arriving in north Africa in the last days of August 1943 after completing their training at New Orleans. Four crews in all were assigned, the 5th, 8th, 11th, and 12th. The size of the boats assigned (36 feet) precluded any substantial amount of open-sea operation and their rescue abilities were thereby limited. They were used primarily as tow-target ships at such African ports as Bizerte, Tunis, and Algiers. This duty was enlivened by occasional assignments to carry messages, or to ferry passengers from

shore to a waiting ship. While assigned to the XII Fighter Command they cooperated closely with British air-sea rescue boats, and the 11th was transferred to the RAF for a month's operational control in the autumn of 1943.[20]

In the spring of 1944 the rescue boat crews were moved to Naples, Italy. The 5th and 8th remained at that station until returned to the ZI. The 11th and 12th were both assigned for a time to operational duty with Flight C of the 1st Emergency Rescue Squadron in Corsica, the 11th from 30 May to 11 November 1944, the 12th for less than a month, from 28 October to 23 November 1944.[21]

Besides the duties already mentioned, the boat crews carried out various other functions. At Naples, transportation of supplies and personnel was a major part of their activity, and the boats were often requisitioned as pleasure craft to carry soldiers on recreational trips to the Isle of Capri. Preparation for inspections played a large part in each crew's life. The 5th AAF Emergency Rescue Boat Crew, for instance, painted their craft at least five times in one year! The importance attached to the appearance of their boat is indicated by the historian of the 5th, who complained:[22]

> Our craft looks fine and we are proud of our paint job when we receive orders that we have an emergency trip to Naples. We sweat and scratch our new paint job bringing the patient aboard and as soon as we start the engine the patient is up and running around bumming smokes. What a life, war a war, and no chaplain.

Crew historians for the 5th and 8th recorded no rescue activity, but the 11th and 12th participated in 11 rescue attempts during their assignment to the 1st Emergency Rescue Squadron. In addition, they

cleared the water of debris, searched for mines, towed seaplanes, ferried flight personnel, and guided seaplane landings with their searchlights.[23]

The work of the boat crews was restricted by the size of their boats and lack of equipment. The first boats to arrive had no radios, which made coordination of their operation with other rescue craft difficult if not impossible. Later, radios were installed by several of the crews.[24] Maintenance and securing spare parts were vexing problems. On one occasion the crew of the 11th waited several weeks for spare engine parts. When three large boxes were finally received, they were found to be packed to the brim with parts for a Scripps engine--their boat had a Continental Commando.[25] The plight of the 8th was even more serious. Arriving at Bizerte at the same time as the 5th, in August 1943, they found their assigned boat irreparably damaged because a light grade of engine oil had been used in the transmission. After what seemed endless months of miscellaneous and irksome shore duties, the crew was transferred to Naples in May 1944 where it was finally assigned another boat.[26] It might be an understatement to say that the AAF emergency rescue boat crews in the Mediterranean were not used in the most efficient manner.

Operations. While air-sea rescue operations in the Mediterranean generally implied waiting for an SOS and then sending out rescue craft, and air-sea rescue plan was formulated in advance on four occasions. The first three--during the invasions of Sicily, Italy, and southern France--were under the control of the British Air/Sea Rescue Service. The

fourth—rescue cover for air transport to the Yalta conference—was originally planned by the Air Transport Command.

Before the invasion of Sicily (July 1943) the British established three zones for which Northwest African Coastal Air Force, Malta Air Command, and Middle East Air Command were each responsible, and exact arrangements were made for rescue cover within these areas. British and American aircraft (OA-10's) were stationed at Bizerte for deep search; British aircraft were at Malta; arrangements were made to attach the British No. 230 Squadron for rescue duties; and the British No. 283 Squadron operated from Tunis with a detachment at Pantelleria. British air-sea rescue units (surface craft consisting of eight high-speed launches, four pinnaces, and six seaplane tenders) were stationed at Malta and in northwest Africa. There were 35½ squadrons based on Malta for the initial assault, but only 30 pilots were lost in the first seven days. From 3 July to 10 July, the period immediately preceding the main invasion of Sicily, 45 lives were saved by the continuous search for missing aircrews by air-sea rescue craft.[27]

Rescue cover for the invasion of Italy (September, 1943) was undertaken by the British Northwest African Coastal Air Force. Tactical air forces assumed responsibility for rescue within 40 miles of the beaches as soon as they were established in the Salerno area. A depot ship, equipped with VHF and equipment for refueling launches and flying boats, was provided for the assault period. The British No. 614 Squadron was based at Borizzo, launches and amphibious aircraft operated from Salerno and Milazzo, Sicily, other launches were at Ustica and Salina in the

Lipari Islands, and AAF OA-10's covered operations from the north African coast. The Allied air forces flew a total of 29,000 sorties in support of the Salerno landings; in the first 8 days of the assault 27 lives were saved by the rescue organization.[28]

The rescue plan for the invasion of southern France (Operation DRAGOON, 14-21 August 1944) allotted the area within 15 miles of the fighter-control ship to RAF rescue units. A British air-sea rescue flying-control team, charged with initiating rescue action, was stationed aboard the fighter-control ship. Another ship, stationed between Corsica and the assault area, was equipped with VHF control, homing facilities, two pinnaces, and special refueling facilities for rescue launches. Rescue craft included two high-speed launches stationed at the fighter-control ship, and launches and rescue planes based at Cagliari and Alghero in Sardinia and Calvi, Borgo, and Ajaccio in Corsica. Naval despatch boats and destroyers were also available for rescue of any aircrew forced down in their vicinity.[29]

Because AAF air-sea rescue facilities in the Mediterranean were increased to a full squadron early in 1944, they were given a more important part in DRAGOON than in earlier operations.

Outside the 15-mile limit rescue responsibility was primarily assigned to the AAF, specifically to the planes of Flights A and C of the 1st Emergency Rescue Squadron. During the week of 14 to 21 August the 2 Corsica-based flights flew 45 missions, achieved 13 open-sea rescues, and saved a total of 27 lives. All those rescued were Americans, except for one German and two British fliers. The squadron was awarded a

presidential unit citation for outstanding performance of duty during this period.[30]

Air-sea rescue cover for the Yalta conference provided a unique and knotty problem. At no other time were such a large number of VIP's concentrated in one overwater area. Parts of the route were totally unfamiliar to the Air Transport Command, charged with the planning responsibility, and some areas were close to German-held positions. Little information was available, and the need for close security made it difficult to obtain more.[31]

It was planned to use 11 U.S. Navy surface craft along the route and to station a B-17 with lifeboat at Bermuda, another at the Azores, and two more in the Mediterranean. Two Navy PBY's were to be at the Azores, and three OA-10's at Tunis, Malta, and Athens. C-47's were to be at Casablanca, Oran, Algiers, and Tunis. Navy squadrons at Bermuda and Port Lyautey and RAF flying boats in the Mediterranean were to be alerted.[32]

Because of the lack of AAF rescue planes, great dependence had to be placed on British facilities, and responsibility for air-sea rescue was shifted to the theater command, which delegated authority to the RAF officer commanding at Malta. Available facilities were then supplemented by the use of 10 British destroyers and 10 Warwick aircraft. Since there were no B-17's equipped with lifeboats in the theater, an attempt was made to move two of them to Malta from an Atlantic station, but the AAF Emergency Rescue Branch stated that this was not possible. In their stead two OA-10's were sent to the Mediterranean (the four B-17's of the 1st Emergency Rescue Squadron, alerted for movement to India, were still

available, but had no lifeboats; three 1st Emergency Rescue Squadron crews were on temporary duty at Malta covering the Yalta conference, but since they had no aircraft they took no active part in the operation).[33] With these changes, the original plan for rescue cover was put into operation on 1 February and remained in effect until 24 February, when all air transport to and from the conference was successfully completed.[34]

With the exception of these two incidents--the landings in southern France and the Yalta conference--rescue activities of the 1st Squadron were confined to search patrols and specific missions resulting from a message from a distressed aircraft. Most of its missions were flown in the Adriatic, since two flights based at Grottaglie and Foggia aided the British rescue facilities in providing cover in that area. One flight, based in Corsica, was active in the Mediterranean waters surrounding that island, north to France and east to the Italian mainland.

The squadron history explained its mission as follows:[35]

> The purpose of this organization is to accompany Fighter and Bomber Squadrons, effecting immediate rescue of their crews, whose misfortune may lie in being set adrift on the open sea. In so doing we may not only save human life, but trained and experienced fliers, who can again be at their battle stations with a minimum loss of time.
>
> Exclusive of the humanitarian aspect, the monetary saving is not inconsiderable. It is estimated that the aggregate expense, to the government, for the training program of an Air Crew, with ten men, approaches a figure in excess of $200,000.
>
> In the event of high swells, making water landings impractical, close radio liaison is maintained with surface craft, namely Crash Boats. Pursuant to the geographic bearings received, these craft locate and pick up survivors that are stranded on dinghies, or that are floating in pneumatic life rafts.

> Generally speaking, the greatest good that can be accomplished by a smoothly functioning rescue unit is that of maintaining and sustaining the morale of flying Bomber and Fighter Personnel. It is no small comfort, to be assured that hovering on the edge of battle is a friendly formation, waiting expectantly to pull one out of the "drink," should he be ill-fated in combat. Such peace of mind definitely contributes to the prevention of "war jitters" and "flying fatigue." It is no less reassuring to know that as soon as a ship is abandoned the location has been accurately plotted and a PBY is launched on its mission. Much of the fear of "ditching" is thereby circumvented and the hope of survival made almost a certainty.
>
> Like the loaded automatic at the MP's side, the very presence of an Emergency Rescue Squadron promotes the realization that help and protection are there, should the exigency arise. This will give to the airmen an additional measure of confidence, so vital to mental composure, for no man is unafraid.

During the first month of operations, a rescue which demonstrated the squadron's zeal in carrying out its mission was effected. On 17 April 1944 an OA-10 sighted a lone survivor in a dinghy while searching for a ditched Wellington. A strong wind and 15-foot waves made a landing almost impossible, but there was only a 300-foot ceiling, and it was feared that if sufficient altitude were gained to send a radio message to bring a rescue launch to the scene, the survivor would not be found again. The crew "unanimously decided" to land, and they picked up the survivor. Since take-off was impossible, the pilot taxied toward Bastia, Corsica, until all gas was expended. Fortunately a high-speed launch was encountered, and the plane was towed to shore.[36]

Twelve days later another Corsica-based rescue crew accomplished a mission which merits description because of the dispatch with which it was executed, and because it reveals something of the procedure employed.[37]

> Six hundred and forty planes, with crews keyed for action, participated in a surprise daylight raid on Toulon. All crews of the 1st Emergency Rescue Squadron were instructed to stand by for immediate search. At 1230, a mission was ordered by the Ajaccio Control Sector and one by one the PBY's took off from the Bay. The "fix" for the "ditching," as given by the disabled B-24G, with both portside engines gone, was 42°22' North and 07°03' East. At 1400 two dinghies, containing ten men, surrounded by sea-marker, and anchored by an open partially submerged parachute were sighted by Lieutenant Mork and crew of Flight "B." Because one of the occupants was known to be injured, permission to land was asked and granted by "Seagull 01," the cooperating surface craft. A smooth landing in a sea corrugated with moderate swells was accomplished and the survivors, most of them drenched to the skin, were helped aboard, through the port blister hatch, after dismounting the fifty caliber machine gun. Never have we seen such a demonstration of elation. "Thank God for the Catalina," one managed through purple lips, and chattering teeth. Sodden clothing was removed and the crew intact to the man, was bundled into blankets and given a "nip of spirits." The men sighed happily. Presently the heat in their stomachs matched the warmth of gratitude in their hearts. Lieutenant Mork started the engines with speculation, not unmixed with apprehension, for the PBY, packed with eighteen persons, and burdened with retrieved equipment, was ponderously loaded. The engines roared mightily, throbbing, pulsating, accelerating and strained for flying speed. The wave crests, with watery fists, pounded the hull unmercifully. After breathtaking suspense, which seemed to stretch interminably, the Catalina, vibrating from bow to stern, cleared the water. An expectant crowd greeted "957" as it tottered up the ramp. The rescued, like so many Indian Braves, only less scantily clad, were helped into a waiting Ambulance and were rushed to the hospital, operated by the 2688th Group.
>
> The B-24G is said to have "ditched" at 1300; the dinghies were sighted at 1400, water landing was successfully made at 1500. The take-off was undertaken at approximately 1530, and the PBY taxied out of the basin and up the ramp at 1615!

In summarizing the exploits of the 1st Emergency Rescue Squadron, the recommendation for citation prepared 6 September 1944 emphasized the almost continual hazard of attack from enemy fighters and antiaircraft and coastal guns.[38] On 16 November 1944, for example, an OA-10 on a

search in the Adriatic was hit by antiaircraft fire and forced to ditch. The rescue crew took to their lifeboats as their plane sank, but rescue operations could not be undertaken until the following day, since the forced landing occurred near dusk. At 0800 on the 17th the survivors were sighted in two dinghies, an OA-10 landed, and the rescue was effected without incident.[39]

As late as March 1945 enemy artillery constituted a hazard for rescue planes and their crews. Take a mission of 21 March, for example:[40]

> Lt. Dunn off at 0835 for a P-40 pilot. Arriving at the fix, the man in a Mae West was located at once. Making sure no mines were in the vicinity, the PBY was landed on the water. Just as the aircraft approached the victim, the shore batteries opened fire with 88mm guns. The survivor was so weak he could not hold the rope to get him up, it was decided to hook him by the Mae West and this proved successful. All the time the coastal guns were throwing all they had. The ship was hit in the wing and the right blister glass was broken. One shell exploded under the tail.

The plane finally managed to take off and return to its base, but two crew members were wounded in the action.[41]

In the performance of their duties, the personnel of the rescue squadron sometimes found themselves giving aid to the enemy. Two rescues of enemy personnel have been described in detail:[42]

> Lieutenant Walker and crew, on stand-by [at Grottaglie], were awakened at 0500 [8 June 1944] and informed of a "ditching" which had occurred fourteen miles South of the "heel" of Italy. During the night a "Beaufighter" had shot down a JU-88 reconnaissance plane which for weeks had been frequenting the sunset skies of Southern Italy; particularly the harbors and convoy lanes. The "Beaufighter" noted the "ditching" position and remained in the immediate locality radioing the "fix," which was established at 39°27' North and 18°25' East, to the control sector. The Catalina, under cover of two "Spitfires" from the 249th Fighter Squadron (RAF), was straightway directed to the

> scene. Two men, both Germans, bobbing about in life vests about one hundred yards from a burning red flare, were sighted at 0605, tossed a rope and assisted aboard. . . . The rescued Germans . . . made it understood that there was a third comrade in their crew . . . missing. After a short period of search the body of the third man was found, floating face down about five hundred feet from the sight /sic/ where the raft was discovered. There was room in the PBY for the dead German and he was lifted aboard thru the port blister hatch. Take-off on moderate swells was comparatively simple. Landing at Grottaglie Field was effected at 0745.

A second rescue of German aircrewmen was accomplished by a Corsica-based OA-10 on 14 June 1944:[43]

> At 0515 hours, Lieutenant Robert B. Bell's crew . . . were alerted for a Rescue Mission . . . at a position thirty-six miles northwest of the Cape at Calvi.
>
> During the night a plane had spotted a distress Signal flare at this position. A "Halifax" had been missing all night and the "Filter Room" reported that a hostile plot had faded in this vicinity. The crew took off at 0615 hours and proceeded by Pilotage and dead reckoning to the position of the proposed search. Here a square search was executed and on the sixth leg at 0718 hours, Sergeant Welling reported over the interphone that flares, sea marker, and a dinghy were visible to the Starboard at a distance of about three miles. The square search was immediately abandoned and the crew flew toward the dinghy soon determining that there were four men aboard. A landing was made and when they had taxied to within about one hundred yards of the dinghy, it was possible to identify the occupants as German fliers. Security measures were taken by placing three of the crew who were carrying .45 Pistols in various positions in the ship. The Germans showed no hostility and appeared to be very grateful for their lives being saved.

Besides the rescue operations which were the particular mission of the 1st Emergency Rescue Squadron, its personnel sometimes engaged in other activities. In December 1944, for instance, they were called on to evacuate the 10-man crew of a B-24 which had been downed in Yugoslavia; an OA-10 removed them from an offshore island. Rescue cover patrols for VIP flights were flown on several occasions. Fighter pilots were ferried

from one field to another, mail was delivered, and transportation for nurses was provided.[44]

Rescue statistics. Determination of the effectiveness of rescue efforts in the Mediterranean Theater is difficult, even if the study be restricted to the AAF 1st Emergency Rescue Squadron. During the first four months of the squadron's operations (April-July 1944) 226 sorties were flown, 59 of them successful; 80 Allied airmen and 6 Axis crew members were saved. In the last 4 months of 1944, 102 missions were flown, and 38 of these were successful. By 31 December 1944 the squadron had rescued a total of 244 airmen.[45]

Comparison of the total number of sorties flown with those which were successful might seem to indicate that approximately 25 per cent of all crews that went into the sea in the first four-month period were saved, and 38 per cent in the four months ending 31 December 1944. Actually no such sweeping conclusion is justified. No consolidated record of the number of Allied aircraft down at sea was maintained, nor of the total number of crew members. Interpretation of even the squadron's own figures is made difficult by the frequent lack of indication as to how many persons were involved either in crashes which were not found or in incidents which were accounted successful. A sortie might be considered successful if 1 member of a 10-man bomber crew were rescued. Finally, some other agency may have saved personnel for whom 1st Squadron crews were searching, but if the 1st Squadron did not find them, the sortie was accounted a failure.

Conclusion. Several recommendations for changes in air-sea rescue equipment, procedure, and planning resulted from the experience in the

Mediterranean Theater. Early in 1944 it was suggested that much more extensive facilities were needed for adequate rescue coverage. Recommendations included 2 air-sea rescue officers for staff and command duty, an airborne rescue detachment with 3 OA-10's for each 400 miles of coast line, and a boat detachment for each 200 miles. All detachments would be self-sufficient for quarters, rations, transportation, supply, and lower-echelon maintenance.[46]

Dissatisfaction with the alert procedure led the personnel of the 1st Emergency Rescue Squadron to suggest changes reminiscent of those recommended by their English counterparts. Rather than wait for a distress call, they urged that rescue planes follow each bombing mission and await the return of the heavy planes. Additional equipment was also suggested. More smoke bombs, rocket lines, sleeping bags, safety belts for survivors, and seasick pills for all personnel in case of extensive taxiing were needed as part of rescue-plane equipment. Because a number of searches had been successful when a flare was spotted, it was recommended that additional flares be placed in each life raft.[47]

American air-sea rescue experience in the Mediterranean Theater was rather brief. Little over a year elapsed between the beginning operations of the first informal organization and the invasion of southern France, which marked the beginning of the end of need for overwater rescue cover in the Mediterranean. The only formal flying rescue unit in the area saw service for less than nine months before its personnel began to be transferred to India, and its activities were curtailed because of lack of planes and personnel. Although the achievements of rescue personnel should not be underestimated, they were accomplished with a minimum of equipment, inadequate

for the task. The lack of equipment and personnel was underlined by the inability of the Air Transport Command and the American theater headquarters to furnish complete air-sea rescue cover for the flights to Yalta. The effectiveness of air-sea rescue cover in the Mediterranean was largely due to the British rescue organization in that area, which provided a continuing service on a large scale from the Sicilian invasion until Germany's surrender.

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Chapter V

THE PACIFIC THEATERS AND THE CBI

Introduction

The war with Japan presented air-sea rescue problems not encountered in the European conflict. The far reaches of the Pacific made overwater flying inevitable in almost all air operations, and called for an air-sea rescue effort on a larger scale than was necessary in other regions. At the same time, the comparatively small land areas made establishing rescue bases difficult. The war in the Pacific necessitated continual movement of bases as the Allied attack, after initial setbacks, began to achieve success. Organization for air-sea rescue in this respect bore a closer similarity to rescue planning in the Mediterranean than in England, for in Great Britain the bases remained constant, and a well-coordinated, constantly functioning communications system for controlling rescue efforts was possible. In the Pacific phase of the war, as in the Mediterranean, standardized control of rescue operations could not so easily be established.

Moreover, the assistance given by the British rescue organization to the AAF in the European and Mediterranean Theaters was absent in the Pacific.* In England an efficient and effective organization trained the AAF rescue control personnel on their arrival. AAF spotter squadrons

*In 1942 the British secured American agreement "to assume rescue responsibility for the United States zone of operations in the Far East" (Air Ministry (A.H.B.), Air/Sea Rescue, p. 136).

were established in a pattern already tested by their Allies, and the American emergency rescue squadron, the 5th, followed the British lead in equipment and practice. In the Mediterranean, also, a British air-sea rescue organization was on hand to aid in the recovery of AAF personnel forced to ditch of bail out overwater. The 1st Emergency Rescue Squadron, and the AAF rescue detachments which preceded it, operated as adjuncts of the British rescue service. In the war against Japan, on the other hand, British aid was important only in the China-Burma-India Theater (CBI). In the Southwest Pacific (SWPA) and Central Pacific (CENPAC) theaters the rescue burden was borne almost entirely by the American forces.

Despite these handicaps, the final rewards for the establishment of effective large-scale rescue organizations in the Pacific were greater than in any other theater. Not only would a higher percentage of flyers be in need of rescue, since virtually all flights were over large areas of water, but also the Japanese had threatened to execute Allied flyers who fell into their hands.[1] The development of air-sea rescue organizations was imperative in the interest of preserving the lives of Allied aircrews, and efforts had to be extended well into enemy-held waters. The rescue services could also serve as a powerful morale builder, for not only was the saving of life important in itself and because it represented a saving in money and in the time spent in flying training, but it might alleviate the flyer's fear of going down at sea with no chance of survival. In the European Theater, Eighth Air Force flyers knew that they had over one chance in three of being rescued if they reached the surface of the water alive. A similar assurance in the Pacific would be tremendously valuable.

The Southwest Pacific Theater

Organization. During the first year of the war there were no AAF rescue organizations in the Pacific, although U.S. Navy amphibious planes carried out rescue duties in both the Central and Southwest Pacific Theaters. But early in 1943 an AAF rescue organization, the Fifth Air Force Rescue Service, was established in the Southwest Pacific. It was pioneered by Maj. John H. Small, Jr., who arrived in New Guinea on 11 December 1942. He found "universal interest in rescue," but no rescue structure in existence. With only one assistant, an enlisted man, and without an organization to help him or any precedent to guide his actions, be began to direct search and rescue missions, using any means that came to hand. For over six months he continued these efforts, using the planes of operational units for search, and calling on the RAAF 1 Rescue Squadron and the RAAF Small Boat Unit for rescue, before two OA-10's were finally assigned to the Fifth Air Force Rescue Service in August 1943. It was nearly a year later (in July 1944) before the first organized AAF rescue unit to reach the Southwest Pacific, the 2d Emergency Rescue Squadron, was assigned to Fifth Air Force. Before its arrival, Major Small had directed operations accounting for 54 rescues during the intensive air attacks on Rabaul, and by April 1944 the tenuous rescue organization had accomplished the surprising total of 455 rescues.[2]

Meanwhile, Thirteenth Air Force interest was aroused by the efforts of the Fifth, and a rescue organization was formed in that headquarters also. When the 3d Emergency Rescue Squadron reached the Southwest Pacific from the Zone of Interior, it replaced the 2d, which was then assigned to the Thirteenth Air Force.[3]

During the first year of rescue operations in the Southwest Pacific, the decision was made to assign the rescue organizations to air force headquarters. Fifth Air Force was responsible for this action, and the Thirteenth followed suit. But the major credit for this decision should be given to Major Small.[4]

The basic AAF air-sea rescue organizations--squadrons and boat crews--stationed in the Pacific were the same as those used in the war against Germany and Italy. As the war progressed, however, the boat crews were combined into squadrons, and these units joined with the air squadrons to form composite groups. This type of organization had evolved in both the Fifth and Thirteenth Air Forces by the autumn of 1944. Thus the Fifth Air Force Rescue Service became the 5276th Rescue Composite Group (CP) on 24 September 1944, combining the 3d Emergency Rescue Squadron and the 14th Emergency Rescue Boat Squadron.* In April 1945 the 6th Emergency Rescue Squadron was also assigned to the 5th Emergency Rescue Group, successor to the 5276th. The 5230th Rescue Composite Group (P) was activated in October 1944 by Headquarters, Thirteenth Air Force. It included the 2d Emergency Rescue Squadron and the 15th Emergency Rescue Boat Squadron.[5]

Although a rescue group was assigned to air force level of command, the individual flights often found themselves widely separated. The flight assignments of the 3d Emergency Rescue Squadron of the Fifth Air Force in the Philippines were typical.

Units of the Fifth Air Force rescue organization began moving into the Philippine Islands late in 1944, the 3d Emergency Rescue Squadron leaving for Dulag, Leyte, on 30 October. From that point, flights of the squadron followed closely on the heels of invasion troops--in December Flight D

*The 14th Emergency Rescue Boat Squadron had been formed in June 1944 from rescue boat crews assigned to various duties in the Australia-New Guinea area.

was stationed in Mindoro, and in January Flight C was transferred to Luzon. By 1 May 1945, squadron headquarters and Flight A were at Tacloban, Leyte; Flights B and C were on Luzon, at Clark Field and San Marcelino, while Flight D was on Mindoro. On 21 May, Flights A and C were moved to Floridablanca, Luzon. Flights A and B were later transferred to northern Luzon to cover air operations from Okinawa. No other moves were made by this squadron until it was transferred to Japan in the autumn of 1945.[6]

Besides this geographical separation, the flights were sometimes under different operational control. In May 1945 the 3d's headquarters and Flight A at Tacloban were directly under the 5th Rescue Group, but Flight B was under the 308th Bombardment Wing, Flight C under the 309th, and Flight D under the 310th.[7]

Similarly, units of the 5230th Rescue Composite Group of the Thirteenth Air Force were located at widely separated points late in 1944. Detachments of the 15th ER Boat Squadron were at Noemfoor, Sansapor and Biak, New Guinea, and Morotai, in the Moluccas, in October 1944. At the same time, Flights B and C of the 2d ER Squadron were on Middleburg Island, off the tip of Dutch New Guinea, and A and D Flights were on Morotai. In April 1945 there were units of the 13th Emergency Rescue Group, successor to the 5230th, on Morotai, and in Palawan, Zamboanga, Leyte, and Samar, in the Philippines.[8]

Personnel and equipment. When the 2d Emergency Rescue Squadron was activated in December 1943 it was authorized a headquarters and 4 operational flights, with a total strength of 59 officers and 205 enlisted men. Twelve OA-10 aircraft, four AT-11's, and four L-5's were allowed by the table of equipment.[9] By January 1945, the 2d Squadron's assigned personnel strength

was 67 officers and 270 enlisted men, and the squadron had in its possession 9 OA-10's, 2 C-47's, and 1 C-45.[10]

On 21 December 1944 the War Department prescribed a revised T/O &E (1-987). Personnel authorization under the new regulation increased the size of emergency rescue squadrons to 93 officers and 328 enlisted men. Aircraft equipment was changed to include eight B-17's, four helicopters, and four L-5's with floats. Each squadron was to retain 12 OA-10's.[11]

The most commonly used AAF rescue aircraft in the Southwest Pacific were OA-10's, although L-5's were authorized and sometimes available, and other types such as C-45's, C-47's, and B-24's were often pressed into service. The OA-10's caused many problems, as they were frequently damaged in water landings. As late as 1945 the 6th Emergency Rescue Squadron lost four ships as the result of damage incurred in landing.[12] Some of the OA-10's manufactured by Vickers in Canada were delivered with equipment which had to be replaced before they could be flown.[13]

B-17's equipped with lifeboats began arriving in the Pacific in the spring of 1945. The first ones brought their own problems, since the rescue squadrons had no mechanics who were familiar with them, and parts were scarce.[14] Helicopters made their appearance in the Pacific in the last months of the war, but they were confined chiefly to land rescue and evacuation duties.* Three helicopters, for instance, were used by the 8th Emergency Rescue Squadron, assigned to the China Air Service Command, by

*The first recorded instance of an air-sea rescue performed by a helicopter in the Pacific occurred on 6 May 1947. The rescue craft was assigned to the 3d Emergency Rescue Squadron, then based in Japan.

May 1945, and succeeded in effecting 7 land rescues within the next 30 days.[15] As late as June 1945, however, the 13th Emergency Rescue Group was unable to obtain a helicopter despite urgent pleas that one was needed to rescue personnel stranded in Borneo.[16] The 5th Emergency Rescue Group had a helicopter by April 1945, but it was used for evacuating sick and injured personnel, picking up prisoners who had escaped from the Japanese, and the transportation of supplies and personnel.[17]

A combination of facilities was often employed in rescue missions. In one such instance an OA-10 and a B-17 of the 5th Emergency Rescue Group cooperated with a submarine in rescuing a pilot on 6 May 1945. The OA-10 arrived five minutes after the fighter pilot was forced to parachute into the sea. Minutes later a B-17 was on the scene and dropped its lifeboat, and the final pickup was made by a submarine.[18]

Personnel and equipment strength of the boat squadrons assigned to the 5276th and 5230th Groups varied greatly. In January 1945 the 14th Emergency Rescue Boat Squadron, of the 5276th Group, had fifteen 85-foot boats, six of 63 feet, five 45-feet long, one with a length of 36 feet, and eight of 28-foot length. Assigned personnel numbered 88 officers and 320 enlisted men.[19] In contrast with the 35 boats operated by the 14th Squadron, the 15th Emergency Rescue Boat Squadron, assigned to the 5230th Group, had only 24--three 104-foot boats, nine 85-feet and twelve 63-feet long. Assigned personnel totaled only 134--30 officers and 104 enlisted men.[20]

Operations. Immediate rescue service accompanied many of the air strikes in the Southwest Pacific. Protection could be advanced to the

immediate vicinity of the target if air superiority, adequate communications, and water landing areas were all present. The rescue service prepared and issued a plan based on the daily operations order; the rescue aircraft and boats then proceeded to the close vicinity of the strike and stood by to come to the aid of personnel compelled to ditch or bail out. In addition to rescue cover on specific missions, daily protection of air traffic and air routes was provided by patrol and alert aircraft and boats. Notice of distressed aircraft was received through assigned communication channels, and the available facilities were sent to the rescue.

An example of rescue cover for a combat mission is afforded by the strike on Balikpapan on 10 October 1944. The Fifth and Thirteenth Air Forces, the 91st Reconnaissance Wing, and elements of the U.S. Navy participated in this action. In order to insure successful rescue cover for an operation of such magnitude, central rescue control and advance planning were necessary. Knowledge of enemy fighter strength, ocean currents, prevailing winds, and weather conditions were essential to determining the number of rescue planes that would be needed, the fighter escort required, the selection of a site for a rescue submarine station, and the location of rescue aircraft stations.

It was decided to use a device known as the "rescue line." The line consisted of rescue craft stationed at definite positions along the path of the tactical operation. Boats as well as planes were sometimes included in such a line, but in this particular case the only rescue facility used, other than AAF OA-10's and Navy PBY's, was one submarine from the Seventh Fleet (submarines used for rescue purposes were appropriately dubbed lifeguard submarines). Seven rescue aircraft of the 2d Emergency Rescue

Squadron were assigned to the rescue line. Two of these were in the forward area nearest the target, and two others covered the middle and rear areas. Three planes remained on the ground on the alert, ready to give aid whenever needed. Since no AAF fighter planes could be spared to afford protective cover for the rescue aircraft, and enemy fighter concentration was expected to be heavy, no planes were assigned to rescue cover directly over the target. The lifeguard submarine was stationed 15 miles off shore, as close as was considered safe in view of the expected enemy fighter opposition and the depth of the sea in that area.

A comprehensive rescue communication order was written, and specific rescue frequency assigned with orders that it be guarded with scrupulous care. Instructions regarding distress calls to the rescue submarine were given, with emphasis placed on the use of a code which would transmit all necessary details on the distressed aircraft (i.e., its position, cause of distress, type of plane, etc.), but would not betray the submarine's presence and location to the enemy.[21]

The rescue cover for the Balikpapan strike operated with the highest degree of efficiency. All personnel who reached water or land away from the target alive were rescued, and it was believed that all those who reached the water alive near the target were also saved. A total of 40 were rescued--24 by plane and 16 by submarine.[22]

The Balikpapan action was not the first instance of air-sea rescue in which naval authorities cooperated with the AAF. In raids on Truk, in April 1944, a lifeguard submarine was a part of the rescue equipment and was credited with saving 22 persons.[23] The use of submarines for rescue

continued to the end of the war. In order to facilitate assignment of submarines for rescue duties, the Navy eventually appointed submarine liaison officers to headquarters of the air forces in the Pacific.[24]

Elaborate safeguards continued to be enforced in order to keep the submarine's presence secret. The necessity for caution often made it impossible for the submarine to rescue personnel in the sea if they were close to enemy installations. It was feared that if the submarine surfaced long enough to allow the survivors to clamber aboard, it would be attacked by enemy fighters or subjected to fire from shore batteries before it could dive. In balancing the possible loss of a submarine and its crew against the gain of an aircrew, the decision was against the rescue attempt. Late in the war, however, a technique which lessened the danger to the submarine in a rescue close to shore was devised. In the event that an airman fell into the sea close to an enemy installation with a friendly submarine nearby, the submarine would pass close to the dinghy at periscope level, and the survivor would pass a rope around the periscope. The submarine would then tow the rescued airman out to sea before rising to the surface and completing the rescue. Several instances were recorded in which this maneuver was completed successfully.[25]

Although the value of submarines in rescue activities was demonstrated on many occasions, each time its employment was the result of a specific request in relation to a particular operation. Naval authorities reserved the right to deny the request if they felt it was not justified, or if the submarine would be greatly endangered. Among other reasons that counted most heavily in such a decision were the importance of the strike, the strength of the enemy, and the adequacy of other rescue facilities.[26]

Despite the measures normally taken to insure the safety of the rescue submarine, there were occasions on which this caution was disregarded. One of these involved a submarine rescue of the crews of an OA-10 and a B-29.

On 29 May 1945 an OA-10 of the 4th Emergency Rescue Squadron* was on station directly over a lifeguard submarine as part of the rescue cover for a bombing mission to Japan. A message was received from a B-29 that its wing plane was about to ditch. A few minutes later, the ditching was confirmed and the position given in code. The OA-10 immediately flew to the site, but found nothing. The B-29 called again, asking permission to give the position "in the clear" (without use of code). After permission was given, the rescue plane flew to the new position and succeeded in spotting two large rafts and one small one. The pilot immediately landed and transferred the survivors to the plane, but on take-off three large swells broke into the cockpit and smashed the propellers. The left propeller and housing were pushed into the pilot's compartment, knocking the pilot unconscious. The co-pilot immediately cut the engines, attempted to staunch the flow of blood from the pilot's lacerated head, and ordered the radio operator to send an SOS in the clear to the submarine. An anxious hour and a half passed before the submarine arrived, took the two crews aboard, and sank the plane with surface fire. The pilot died during the night and was buried at sea, but the other survivors were put ashore at Iwo Jima the next morning.[27]

*For an account of the 4th Emergency Rescue Squadron, see pp. 82-83, .

The individual rescue planes and their crews were the primary agents in the saving of life in AAF operations. The aircraft flew assigned patrol sectors during bombing missions and carried on routine patrols of air lanes. In addition, one or more crews of each unit were customarily on a stand-by alert in case of an unexpected request for help. When an SOS was received, either by a rescue plane in the air or by a ground receiver, the rescue plane reached the scene as quickly as possible and began its search. When and if the crew in distress was located, the OA-10 landed and picked up the survivors. If sea and weather conditions did not permit a larding, the rescue plane dropped supplies--including a dinghy--circled over the spot, and attempted by means of radio to bring a surface craft to the rescue. The assignment of B-17's with lifeboats early in 1945 removed some of the necessity for hazardous amphibious landings. The lifeboats carried by the converted bombers provided the crew in the sea with a means of survival without further assistance. Usually, however, surface craft intercepted the lifeboat and removed its occupants before it had proceeded very far.

An example of an efficient B-17 rescue operation occurred on 13 June 1945. A B-17 dispatched to search for a B-24 crew down in the sea somewhere between Formosa and Luzon searched fruitlessly for 7½ hours and was returning to its base when it received a strong distress signal. It turned back and some 25 minutes later spotted 2 life rafts. Dye markers and flares were dropped to mark the spot, and smoke bombs to indicate the wind drift. The lifeboat was then successfully dropped within 40 feet of the rafts. After the survivors boarded the boat, a note was dropped giving them their position and course, and a few hours later motor torpedo (PT) boats were on hand to make the final rescue.[28]

Earlier that same year, an OA-10 crew of the 13th Emergency Rescue Group completed a spectacular rescue of the 17 survivors of 3 B-25's shot down near their target, Zamboanga, in Mindanao. One crew was so near the Japanese-held beach that enemy barges were already on their way to capture it when the rescue plane landed. Other B-25's in the vicinity held off the barges while the rescue crew, working under machine-gun and mortar fire, picked the men up. The second B-25 was near-by, but only 500 yards off-shore. Nevertheless, the OA-10 taxied in and picked up the crew. At this time 1 engine became overheated and went out of commission for 15 minutes. The third B-25 was 15 miles away, but the sea was too rough for a take-off, and the pilot taxied the entire distance. By the time the last group of survivors was reached, the OA-10 was leaking badly from the buffeting of the high waves, but the jettisoning of 400 gallons of gasoline lightened the plane sufficiently to make possible a take-off even with 25 men aboard.[29]

These two incidents illustrate the varying abilities of the two types of rescue aircraft. The B-17 was able to insure survival of distressed airmen without any danger to its own crew other than that normally present in a long overwater flight. The OA-10 could perhaps have done the job as efficiently, but the rough sea would have endangered the rescuers. On the other hand, the rescue performed by the OA-10 could not have been accomplished by a B-17. In the time it would have taken for the B-17 to drop a lifeboat, the B-25 crews nearest the enemy beach might very well have become Japanese prisoners. For such a rescue operation as that off Zamboanga, the B-17 was no substitute for an amphibious plane.

In the spring of 1945 the need for long-range rescue aircraft to accompany raids on Japan led to experiments with B-29's fitted with a lifeboat. Although finally successful, the experiments were not completed in time for B-29's with lifeboats to see action in the war. B-29's were eventually used for rescue purposes in the bombing missions against the Japanese home islands, but their duties were confined to search, orbit, and dropping emergency equipment.[30]

Besides saving lives on the sea, the emergency rescue air squadrons and boat crews were often called upon for land search and rescue. Even in the wide reaches of the Pacific some airmen did manage to hit the islands, dwarfed though they were by the water expanses surrounding them. Friendly natives often hid Allied pilots and managed to convey word of their presence to the nearest AAF forces. Evacuation by air or boat was then arranged.

Rescue facilities were also used for many purposes other than rescue. Prisoners were sped by rescue planes to intelligence officers for interrogation, critically wounded or ill persons were evacuated for treatment, and intelligence personnel were dropped behind the enemy lines. Carrying messages and supplies to guerrilla forces, particularly those in the Philippine Islands, was often a duty assigned to rescue personnel, and air rescue planes were also used for maintaining liaison between services, for photographic missions, and for reconnaissance. Boat units were commonly used for transportation and evacuation missions, and there were several instances of crews whose duties seemed to consist largely of providing recreational trips for other military personnel.[31]

Statistics. Despite the attention given to these other duties, available statistics indicate a creditable performance of the primary mission. The 2d Emergency Rescue Squadron achieved a record total of 588 rescues.[32] The accelerated pace of bombing missions after the AAF came within range of Japan is indicated by the record of the 6th Emergency Rescue Squadron, which arrived in SWPA in April 1945. Operating from the Philippines, Ie Shima, and Okinawa, the 6th amassed a total of 232 rescues in less than 5 months.[33] Among the air forces, the rescue organization of the Fifth Air Force accounted for approximately 1,650 rescues by April 1945.[34]

Surface craft played a major part in rescue operations in the Pacific. For instance, during its first year of operation (July 1943-June 1944) Fifth Air Force Rescue Service boats and planes each accounted for approximately an equal number of rescues.[35] After June 1944, however, the superiority of seaplanes for rescue operations became apparent as the air war ranged farther north and combat aircraft flew longer missions. By January 1945 seaplane rescues totaled 650, while only 380 survivors had been picked up by surface craft.[36]

Any accurate total of rescues is rendered difficult by the absence of consolidated statistics. Lack of statistical evidence also makes it difficult to state the percentage of successful rescues. The statement was made at an air-sea rescue conference at Guam on 3 July 1945 that rescues were being accomplished in 90 per cent of all cases where the ditching or bail-out was successful, but there was no indication that this referred solely to AAF efforts.[37]

Rescue statistics compiled from the Far East Air Forces Air Surgeon's monthly reports for July 1944 through February 1945 (see tables on the following page) show that rescue effectiveness during the eight-month period averaged 46.4 per cent in cases where the location of the survivors was known. If the total number of missing aircrew members were considered the average percentage of personnel rescued dropped to 29.9 per cent.[38] These figures were far below the 90 per cent mentioned in July 1945, but they represented a more impressive record than that achieved by the Eighth Air Force, where the problems were not nearly so complex. The Far East Air Forces' well-trained crews had one chance in two of being rescued upon completion of a successful ditching, as compared with one in three in the Eighth Air Force.

The Central Pacific Theater

Organization. The initial rescue plan for the Central Pacific was based on the assumption that the U.S. Navy would be completely responsible for air-sea rescue. The theater did not establish requirements for any AAF rescue units until the existing rescue cover was found to be inadequate for XXI Bomber Command operations. The inadequacies of the rescue organization were pointed out by a study of 6 November 1944 which stated:[39]

> . . . The Navy was found to have a well-organized and effective air-sea rescue organization. The Air Forces in that area did not have a good organization and did not appear to be at [sic] in the least concerned therewith. The Navy organization is built around and for carrier strikes. It is not an organization for, nor does it effectively operate with shore based aviation.

The AAF had determined from experiences in the Southwest Pacific that rescue units should be a part of a combat air force, and should not be under theater commands affording rescue cover on an area basis. In the

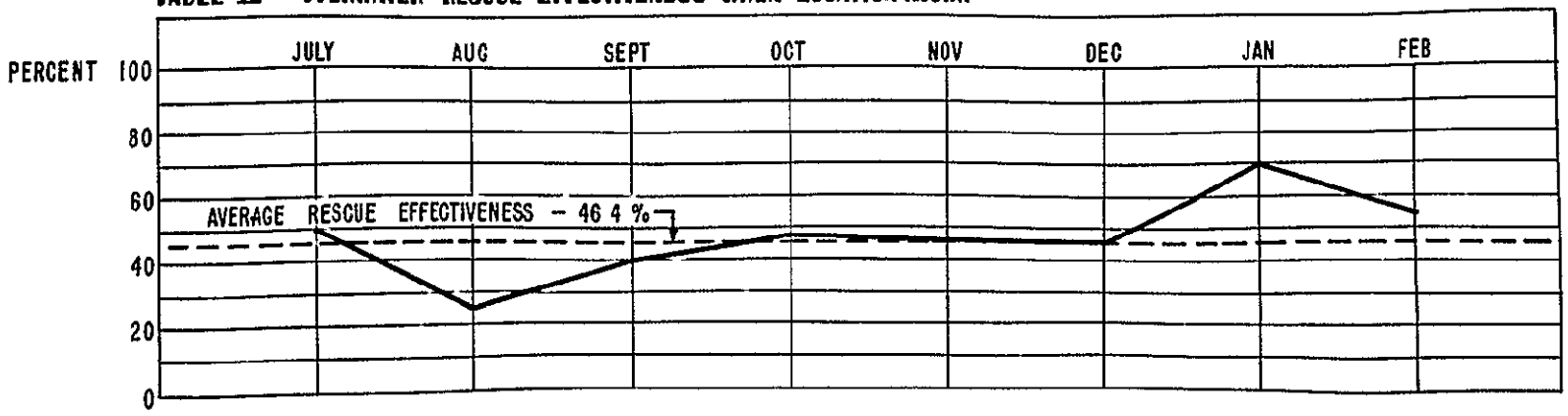
EFFECTIVENESS OF AIR-SEA RESCUE IN THE FAR EAST AIR FORCES

JULY 1944 - FEBRUARY 1945

TABLE I - TOTAL PERSONNEL RESCUED AND TOTAL MISSING WHEN LOCATION KNOWN

BY MONTH	TOTAL NO. MISSING	RESCUED PERSONNEL	PERCENT RESCUED	OVER WATER			OVER LAND		
				NO INVOLVED	RESCUED	PERCENT RESCUED	NO. INVOLVED	RESCUED	PERCENT RESCUED
JULY 1944	109	59	54	83	42	51	26	17	65
AUG	87	19	22	77	15	19	10	4	40
SEPT	137	62	45	85	34	40	52	28	54
OCT	171	55	32	88	41	47	83	14	17
NOV	295	156	53	205	96	47	90	60	67
DEC	145	75	52	108	49	45	37	26	70
JAN 1945	141	75	53	79	55	70	62	20	32
FEB	103	50	49	51	27	53	52	23	44
TOTAL	**1188**	**551**	**46.4**	**776**	**359**	**46 3**	**412**	**192**	**46.6**

TABLE II - OVERWATER RESCUE EFFECTIVENESS WHEN LOCATION KNOWN



SOURCE HQ. FEAF, 2D AND 3D OPNS ANALYSIS SECS., EFFECTIVENESS OF AIR-SEA RESCUE JULY 1944 - FEB. 1945

Central Pacific, however, the AAF concept could not be realized, since it conflicted with directives issued by the theater command enjoining area or island responsibility for land-based aircraft.[40]

Rescue coverage improved as a result of AAF augmentation of naval facilities in the spring of 1945. On 6 February the 4th Emergency Rescue Squadron arrived at Peleliu, in the Palau group, to assist in covering missions against Japan, and in July the 6th ER Squadron--assigned to Fifth Air Force--was divided between Ie Shima and Okinawa to assist in rescue operations for missions to Japan. The 7th ER Squadron was redeployed from India to Okinawa in August for the same purpose, though the war ended before it could render any assistance.[41]

That the situation was still unsatisfactory to the AAF, however, was indicated by a series of letters between Lt. Gen. Barney M. Giles, Commander, AAF in Pacific Ocean Areas, and Lt. Gen. Ira C. Eaker, Deputy Commander, AAF, in May, June, and July 1945.[42] General Giles characterized the rescue cover as "inadequate," and the AAF contributions as "late and small."[43] General Eaker replied that "the meagerness of the AAF contribution to rescue facilities in the Central Pacific has been due, I believe, to the fact that in the past we have let somebody else run the show."[44]

No action was taken, however, to increase the AAF share of responsibility, and since according to the theater commander's directive the naval commander in the Marianas was responsible for the area, AAF planes and personnel were made available to the Navy's rescue task group. The assignment of AAF personnel made possible the establishment of a rescue control center on Iwo Jima. This center, ostensibly a Navy responsibility, was manned and almost completely equipped by the AAF.[45]

AAF facilities became even more important in July, when Navy seaplane squadrons were moved to the Ryukyus. Henceforth the only aircraft suitable for rescue work available to the naval rescue task group were those of the AAF 4th Emergency Rescue Squadron. Operational B-29's of the Twentieth Air Force were therefore called on to augment the rescue coverage, thus weakening combat strength.[46]

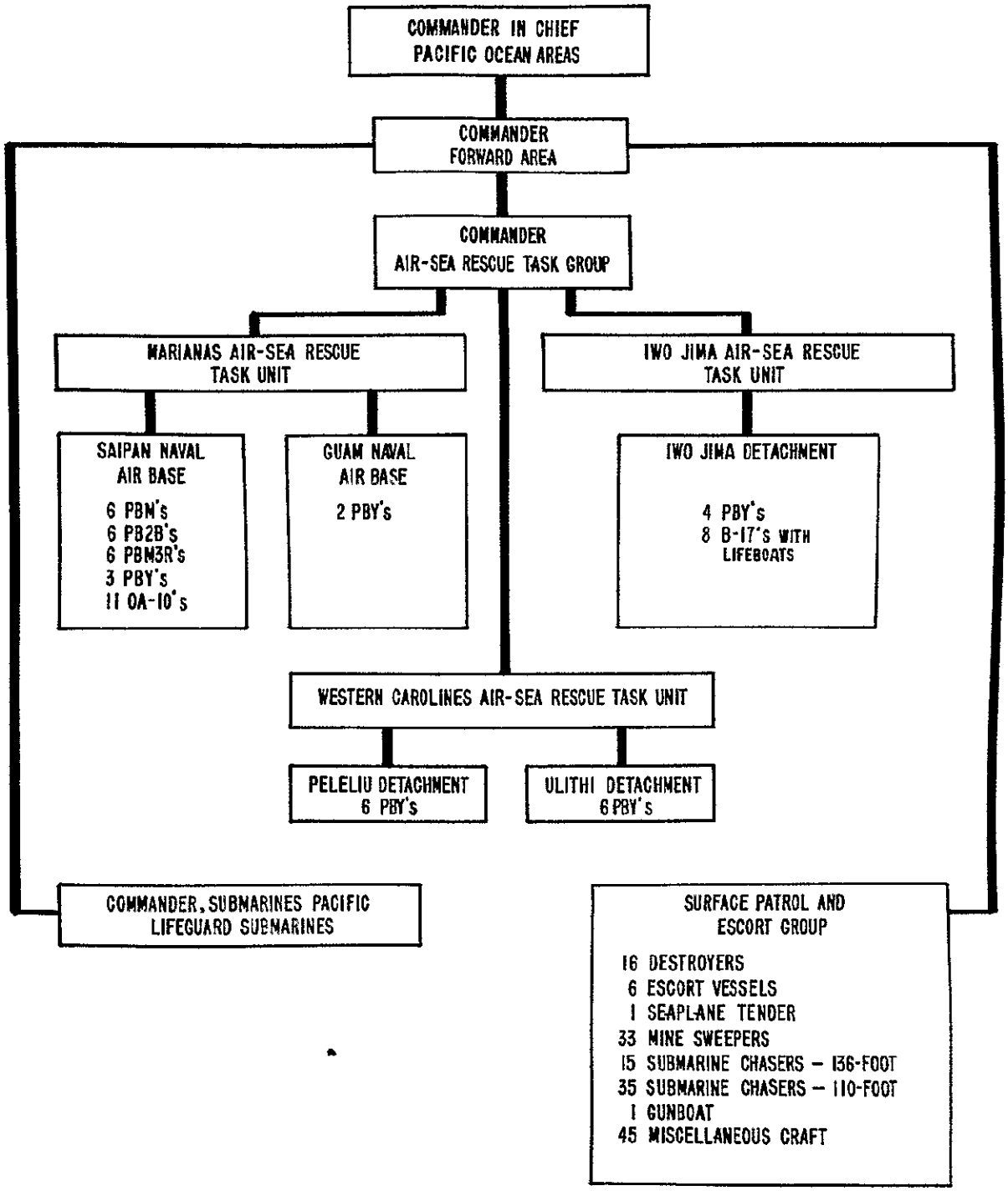
Personnel and equipment. The 4th Emergency Rescue Squadron had an effective assigned personnel strength of 98 officers and 298 enlisted men on 1 July 1945. There were 36 officers and 130 enlisted men on Saipan, and 62 officers and 168 enlisted men at Peleliu and Iwo Jima. Assigned aircraft included 11 B-17's and 14 OA-10's.[47]

Operations. The rescue plan for the raids on Japan envisaged an air-sea rescue task group made up of three units based in the Marianas, on Iwo Jima, and in the Western Carolines. The accompanying chart shows the extent and location of air-sea rescue facilities.[48]

This variety of available rescue craft made it possible for the naval task group to divide rescue responsibility into three areas: near air bases, up to 600 miles from base, and over 600 miles from base. The allocation of rescue facilities for these areas was as follows:[49]

1. Near air bases
   a. Patrol boats on duty off runways
   b. Crash boats on stand-by alert
   c. PBY's (with 600-mile radius) on stand-by alert
   d. Fighter planes for observation duty on stand-by alert

AIR-SEA RESCUE PLAN FOR CENTRAL PACIFIC
1945
(RESCUE COVER FOR XXI BOMBER COMMAND)



2. Intermediate range (0-600 miles from base)

a. PBY's and/or PBM's were stationed on the bombers' course to radio position of and orbit over distressed aircraft, guide a destroyer or other surface craft to the rescue scene, and drop life rafts and supplies if needed. They did not usually land.

b. B-17's operated from Iwo Jima after the arrival of the 4th and 6th Emergency Rescue Squadrons.

3. Far range (600 miles to near target)

a. Destroyers were stationed on bombers' course out of range of enemy land-based planes, unless fighter cover was provided.

b. Submarines were stationed on bombers' course closer to enemy shore than destroyers.

c. B-29 search aircraft were stationed over or near the submarines and/or destroyers. (In 1945 the XXI Bomber Command sent two B-29's along on missions to Japan as search and rescue aircraft. They carried a large gas load, had no bombs, and were stocked with a large quantity of life-saving gear. They accompanied the bombers, rendezvoused at an advance point with the submarine and/or destroyer, and followed the bombers home. If a ditching occurred, the rescue B-29 went to the position, gave the sea craft a fix on the distressed crew, orbited their position to assist the rescue craft to pick up the survivors, and dropped supplies if necessary).[50]

Communication facilities available for rescue operations in the Central Pacific included the following:[51]

1. Liaison radio (AN/ART-13 transmitter and BC-348 receiver)--used to contact ground stations for requesting and receiving D/F bearings, and to send distress messages.

2. VHF Command Sets (SCR-522)--used to contact other B-29's to alert rescue facilities, and to obtain a VHF D/F bearing if within 100 miles of the base.

3. Radio compass (AN/ARN-7)--used as a homing device when a long distance from rescue facilities, for obtaining a bearing on a powerful broadcasting station, and as an emergency receiver for frequencies from 100 to 1,750 kilocycles.

4. IFF (SCR-695)--used to give base stations a bearing if within 100-mile radius, to enable submarines to take a bearing, and to report an emergency involving radar equipment.

5. Radar set (AN/APQ-13)--used to pick up rescue aircraft beyond range of vision, to obtain position in relation to the coast line, to home on rescue facilities and islands, to obtain an accurate position by intercepting a radar beacon, and to obtain altitude reading.

6. Loran set (AN/APN-4)--used to obtain an accurate line of position within a 1,200-mile radius of a suitable ground station.

7. Emergency communication equipment (carried in plane):

   a. Gibson Girl transmitter (SCR-578)--a portable transmitter that could be used in the plane, life raft, or lifeboat. This device transmitted a signal on an international rescue frequency of 500 kilocycles, but could not receive messages.

b. Radio transmitter buoy--a device which, dropped by a rescue plane, would automatically send a signal over a period of hours. Rescue craft could hom on the signal with their radio compass.

c. Corner reflector (MX-137 or MX-138)--a device that could be used by survivors to reflect radio energy back to a receiver or to a radio set.

d. Visual aids to rescue--flares, sea marker, and smoke grenades.

Aircraft in distress in the Central Pacific were directed to take the following actions:[52]

1. If able to communicate with the usual aeronautical station or another known Army or Navy station, the aircraft was immediately to establish such communication on the assigned frequency, using prescribed procedure. Sufficient information was to be transmitted to permit identification and location. The circuit was to be kept open so that changes in the situation could be transmitted. For security against enemy interruption of the message, code symbols were to be used when available, and the messages kept free from unnecessary information.

2. If the usual aeronautical station could not be contacted, a communication with some other class of stations was to be attempted by transmitting distress signals.

a. The following frequencies were prescribed for this purpose:

1) 140.58 kilocycles (Fighter air-sea rescue frequency)

2) 4,475 kilocycles (High frequency air-sea rescue frequency--voice)

3) 500 kilocycles (International distress frequency)*

*When transmitting on 500 kilocycles, the operator was to remember that international regulations required all maritime stations to maintain watch on that frequency twice an hour for three-minute periods at 15 and 45 minutes after the hour.

4. 4,495 and 6,610 kilocycles (Army air common calling frequency, used if near AAF activities)

5) 3,105 and 6,210 kilocycles (Civil air common calling frequency, used if near civil air activity)

6) 4,495 kilocycles (Voice--used if near civil air activity)

b. Two kinds of distress signals were used:

1) Radiotelegraph--SOS or three dots, three dashes, and three dots. The automatic alarm signal, consisting of a series of 12 dashes in one minute, activated automatic alarm-receiving instruments and initiated an alert which called the operator to his station. A two-minute interval was to elapse between the signal and the distress message.

2) Radiotelephone: Distress call was the signal "Mayday."

3. The aircraft was to follow the distress call with a distress message as soon as possible.

a. The distress message was to identify the aircraft, and give its position and a description of the difficulty encountered. Transmission was to be continued for as long as possible so that D/F stations might locate the distressed aircraft.

b. The distress message, whenever possible, was to be in code. To facilitate its use, reference points were established in the areas where it was anticipated that a large number of water landings would occur. A series of six code names was assigned to each reference point, and these names were rotated daily. These points and their code names were used in the appropriate field orders. In reporting a position, the distance in nautical miles from the

nearest reference point, the code name for the point, and the true bearing from that point were all to be indicated. For example, the message might begin "15 Hairbreadth Harry 180." Decoded, this would indicate that a plane was in distress 15 nautical miles from a certain reference point (Hairbreadth Harry), on a bearing of 180 degrees from the point. If the positions of both the reference point and the rescue plane or vessel were known, the distressed aircraft or a companion might "steer" the rescue craft to the survivors by using the reference point. Such messages might read "hairbreadth Harry steer course 120 degrees for three miles," or "Hairbreadth Harry change course 30 degrees left and go three miles."

c. Use of the reference point was restricted to a voice call, and such points were to be considered neither as rendezvous for rescue nor as sites for emergency landings. Other distress information was also to be transmitted in code. The message might include identification of the survivors' base, the aircraft type, the condition and number of survivors, and whether sea dye marker had been released.

d. Each base was assigned a code name, and aircraft types were assigned the following code names: Chicken--fighter; Hawk--dive bomber; Fish--torpedo bomber; Boxcar--heavy bomber; and Monster--very heavy bomber.

e. The number of survivors was indicated in the clear, but the following code words were used to indicate their condition: Goodyear--in a raft; Yellow Jacket--in life jacket(s); and Davy Jones--without life jacket(s).

f. The presence of dye marker was indicated by the word "Evergreen." A typical message might read, "15 Hairbreadth Harry 180 Prattle Monster Goodyear 12 Evergreen." Decoded, this would mean that 12 survivors of a B-29 from (Prattle) base were down 15 miles from the reference point on a true bearing of 180 degrees, that the survivors were in life rafts, and that dye marker was showing.

When the rescue aircraft sighted the survivors, a message was sent to guide surface craft to the rescue, and one or two planes orbited the survivors (i.e., circled over the scene so as to aid the rescue craft in locating them). If two planes were present, one climbed to an altitude from which IFF signals could reach the nearest base (an altitude of 1,000 feet for each 10 miles distance was required for this purpose), so that a fix could be obtained on the position. The orbiting aircraft whenever possible remained until relieved or until the rescue craft saw the survivors. When the rescue surface craft appeared, the orbiting airplane identified it by means of prearranged signals and directed it to the survivors. The rescue could be hastened if the orbiting aircraft indicated the direction of the survivors from the rescue craft by zooming from just above the imaginary line between the two. If it was desired that the rescue vessel follow the orbiting plane, the latter circled the vessel

twice, opening and closing the throttle, and then flew toward the survivors. If the orbiting aircraft had to leave before the rescue vessel appeared, the location of the survivors was marked by a smoke signal.[53]

Statistics. Although AAF personnel were dissatisfied with the rescue cover provided under Navy direction in the Central Pacific, the results compared favorably with those in other theaters. In its attacks on Japan from November 1944 to 14 August 1945, the XXI Bomber Command lost a total of 361 B-29's and 3,105 crew members. Of the latter, 1,424 were known to have gone down at sea. The total number rescued was 687, only 22.1 per cent of the total number lost, but 48.2 per cent of those known down at sea.[54] The figures for individual months are given in the two accompanying charts. It will be noted that air-sea rescue efforts became more effective during the six months immediately preceding the Japanese surrender. Unfortunately no statistics on the rescues performed by AAF units alone are available.

Naval Air-Sea Rescue in the Pacific

Until 1944 rescue was regarded as an additional duty of naval amphibious aircraft (PBY and PBM) units, but early in that year the Navy began to station seaplane tenders and aircraft close to the scene of operations, with definite assignment to rescue duty. When needed, submarines and surface vessels were also employed.[55]

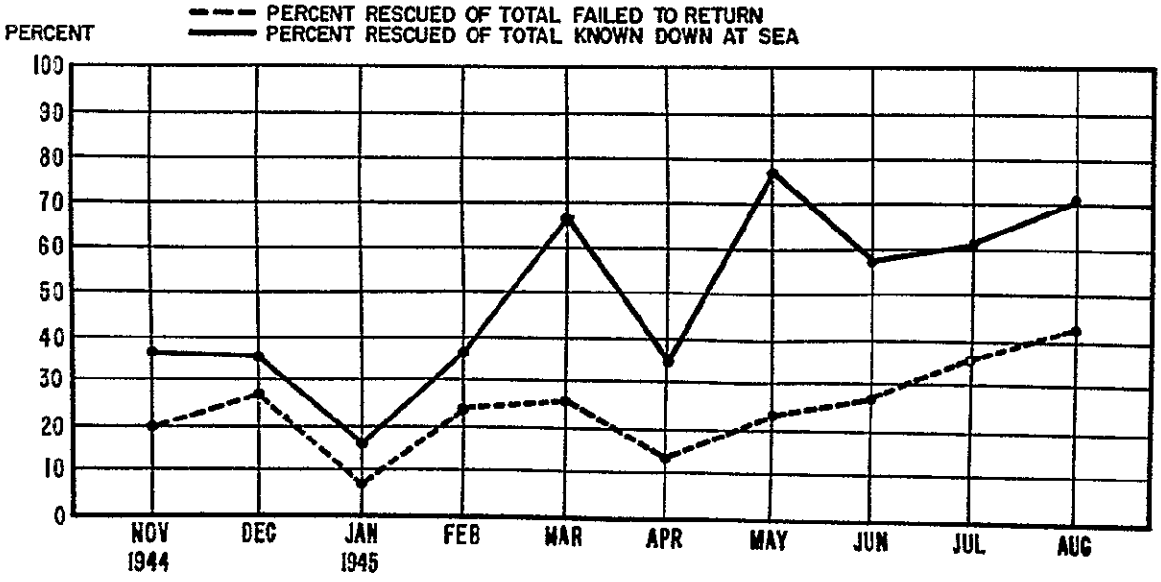
Naval rescue procedure specified advance requests from combat units for rescue cover, general and particular information for crews which had

XXI BOMBER COMMAND — NOVEMBER 1944 – AUGUST 1945

CREW MEMBER LOSSES

MONTH	FAILED TO RETURN	KNOWN DOWN AT SEA				NUMBER RESCUED
		DITCHED	CRASHED	PARACHUTED	TOTAL	
NOV 1944	70	36			36	14
DEC	227	157	22		179	63
JAN 1945	279	134	33		167	21
FEB	259	137	45		182	65
MAR	310	105		10	115	77
APR	516	57	43	67	167	55
MAY	764	112	33	85	230	183
JUN	390	12	55	113	180	102
JUL	210	22	22	76	120	73
AUG (1-15)	80	34	11	3	48	34
TOTAL	3105	806	264	354	1424	687

MONTHLY PERCENT OF RESCUES



SOURCE: TWENTIETH AIR FORCE – A STATISTICAL SUMMARY OF ITS OPERATIONS AGAINST JAPAN, PP 23-25

to ditch, and emphasis on crew training in ditching, bail-out, and rescue procedures. Requests for rescue facilities had to contain the estimated time of departure and arrival and the time over target of the tactical mission, detailed communications information (including specification of a distress channel), the desired number of rescue planes and their positions, and an estimate of how long they would be required. General ditching information included instructions for each crew member as to his position and his duties in case of a ditching. Particular information for ditching aircrews often dealt with the region over which they flew. Crews flying from Saipan, for instance, were informed that their chances of rescue would be improved if they managed to reach the sea near one of the Mariana Islands, and they were told in detail of the reception they might receive on the various islands. On one of them the natives were friendly, and there were no Japanese; on another a Japanese encampment had been reported, but the native village at the other end of the island might afford a refuge; and so forth.[56]

In the Southwest Pacific, Navy amphibious squadrons worked side by side with AAF emergency rescue units. Besides offering direct assistance to AAF combat crews in distress, Navy personnel were often in a position to aid AAF rescue units. Because the OA-10 was a plane with which the AAF was relatively unfamiliar, the AAF squadrons who flew them found maintenance facilities and spare parts lacking within their own organization. Needed parts were sometimes supplied by naval stores, and maintenance problems solved with the aid of naval personnel. AAF rescue boat crews also took advantage of the Navy's generosity to obtain parts, fuel, and oil when they could not be found elsewhere.[57]

An analysis (see the accompanying chart) of naval rescue figures may be compared with the somewhat similar one compiled by FEAF.*[58] Unfortunately for the present purpose, the naval survey was concerned with an earlier period and included only one month, so no general conclusions can be drawn. The figures do seem to indicate, however, a higher degree of rescue efficiency. The fact that they refer to an earlier period than to the FEAF statistics emphasized the validity of this statement, since rescue operations became more efficient in the autumn of 1944 and in 1945.

The China-Burma-India Theater

Introduction. Rescue operations in China and India during World War II were of no great importance to the history of air-sea rescue, since most of the flying in both regions was over land. The history of the 8th Emergency Rescue Squadron, stationed in China, does not include a single instance of air-sea search or rescue, and 50 per cent of the 7th Squadron operations in India were concerned with land rescue. The period of operations was not long in either case. The 8th Squadron did not arrive in China until May 1945, and the 7th was operational in India only from March until July 1945.

British Facilities in India. The first rescue cover for aircraft based in India was provided by the British. Beginning in July 1943 with an air-sea rescue unit with 2 launches, by mid-1944 the RAF rescue service included 45 high-speed launches based at points along the coasts of India and Ceylon from Karachi to Chittagong, an air-sea rescue squadron (No. 292) equipped with long-range search aircraft and amphibious planes, and a

*See tables following p. 81.

SUMMARY OF AIR-SEA RESCUE OPERATIONS IN THE PACIFIC

MAY 1944

	CARRIER STRIKES	SOUTH PACIFIC LAND-BASED	CENTRAL PACIFIC LAND BASED	TOTAL
NUMBER OF INCIDENTS†	39	29	9	77
NUMBER OF RESCUES	25	12	3	40
PERCENT OF RESCUES	64	41	33	(AVERAGE) 52
TOTAL PERSONNEL INVOLVED	66	56	53	175
NUMBER OF PERSONNEL RESCUED	42	17	7	66
PERCENT RESCUED	64	30	13	(AVERAGE) 32
NUMBER OF PERSONNEL IMPOSSIBLE TO SAVE*	9	20	23	52
PERCENT RESCUED EXCLUDING IMPOSSIBLE TO SAVE	74	47	23	(AVERAGE) 54

SOURCE: COMDR., AF PACIFIC FLEET, SUMMARY OF AIR-SEA RESCUE OPERATIONS IN THE PACIFIC, 30 JUNE 1944

† AN INCIDENT IS ANY CASE WHERE ONE PLANE IS KNOWN TO HAVE BEEN FORCED IN THE WATER OR IS MISSING UNDER CONDITIONS WHERE A WATER LANDING WAS POSSIBLE.

* PERSONNEL ARE IMPOSSIBLE TO SAVE ONLY WHEN THERE IS PROOF THAT THEY WERE DEAD BEFORE A RESCUE COULD HAVE BEEN MADE

rescue organization modified to fit the local scene, but modeled after that in use in the United Kingdom.[59] Rescue facilities available in 1944 were adequate for missions such as the AAF XX Bomber Command's attack on the Palembang, Sumatra, oil center on 10 August. Submarines were employed close to the target, cruisers were stationed along the line of flight in the Indian Ocean, and destroyers patrolled the waters close to the bombers' base at China Bay, Ceylon. A variety of aircraft types were used for patrol of the area within 300 miles of Ceylon. Forty-one aircraft took part in the raid, and only one was forced down. The lone unfortunate B-29 ditched at 0400 on 11 August at a position 160 miles ENE of China Bay. Rescue aircraft located the survivors the following day, and a destroyer rescued the entire crew.[60]

AAF air-sea rescue in India. A small AAF rescue detachment was attached to the RAF for operations in June 1944. With two PBY's and only one crew, this unit afforded rescue cover for many XX Bomber Command long-distance missions.

When the unit's pilot, 1st Lt. C. J. Graham, returned to the United States, he made some pungent comments on his experiences. To preserve the full flavor of his remarks, his report is quoted in full.[61]

> 1. Back in the early days of 1943, I, as one of fifty Army pilots, was sent to Pensacola for PBY training. After graduation, I was sent to pilot school, navigation school, bombardier's school, and finally began instructing in PBY's. This continued until June 1944, when two of us were sent to the 10th Air Force in Calcutta. Immediately upon our arrival, we were put on detached service of the 231st Group, a British primary command. It was planned that we would have three PBY's and three pilots with which to operate. One fellow, already in India, was to join us, but before we arrived, he had been placed on B-24's and had finished his missions so that he was no longer available. After we arrived in India, we found that our Canadian built PBY's had

to be "beefed-up" before they could be used. This required about four months during which the kid who flew over with me turned the one flyable plane over, killing himself and ten others. That left me with the responsibility of doing all the rescue work. As a result, I flew 250 hours in two and one half months. That is why I'm home. I couldn't take it. There were six officers and forty enlisted men in our organization. There were myself and one other American as pilot and co-pilot, two RAF navigators, and two RAF radio men. The rest of the outfit was American. After my buddy was killed, I had two ships, so I flew one while the other was being repaired. One Thursday night, I took off on an 18-hour mission, returned and was on the ground only one hour, when it became necessary to fly a 9-hour mission. I returned from this and was on the ground for five hours before I had to go out again on a 14-hour flight. When I came back, it was Sunday. We were in no particular danger, so the least we could do was to give all our support to the boys who were getting shot up, even though it meant flying long hours. Finally, just before I left, the Army sent a full squadron in to do the work we had been doing. It arrived just a year too late for the CBI has just about folded up as far as air-sea rescue is concerned. Three PBY's and three crews would take care of all the work there, but they sent the squadron there a year late.

2. We worked entirely with B-29's. The set-up was co-ordinated so that when the big friends would go out on a strike we would follow. It was timed so that after they had left the target and were about twenty minutes on the return, we would meet. We would turn with them and follow them home. In other words, we would patrol their course out and back. The biggest discrepancy to my knowledge, and one that the 20th Bomber Command refused to do anything about, at least as far as I know, was the fact that the bomber radio frequencies weren't coordinated with ours. When one of them was shot up or on fire, and he had to ditch, he had to relay a message to his home base. They in turn would send a message to the 231st Group, which was our headquarters, who would send it to us. All this time wasted, and we were only twenty minutes away from any of the bombers. Instead of co-ordinating their frequencies with us, they had to go through all these channels. I know of three crews I could have saved if they could have communicated directly with us. They might have that worked out by now, but they didn't have when I left. We were supported by stripped down RAF B-24's. When I left, they had begun to use B-17's equipped with lifeboats. At this time they were experimenting with this ASR equipment and finally perfected it. To date, I've never heard of anybody using the boats dropped.

3. The greatest difficulty in air sea rescue lies in the survival equipment in the planes. Life rafts have just about one third of the pyro-technics they needed. Those provided are too small. The pyro-technics put in a life raft to be used in operational aircraft should include the largest Very signals obtainable. The present equipment can't be seen, especially on

a hazy day. I rescued thirteen men one time because one man out of the thirteen knew how to use the signal mirror with the little cross in it. That's the only thing that saved them. Special instructions in the use of that mirror and a lot more pyro-technics will save many more crews. We found the best altitude for search to be 500 feet or below. A dinghy from 500 feet looks like a spool of thread, but still a fellow in a dinghy with a Very pistol will shoot it right square at you every time instead of shooting it at 90 degrees as he should. By doing this, attention is attracted to the trail of smoke. If he shoots it right at you, it looks just like a tiny red dot. There are so many reflections on the water that it is always difficult to distinguish a raft. I've seen sharks and monster turtles surface which were so similar in color to a raft (a bright yellow) that I've circled them for hours many times. Even after you see a dinghy on the water, it's awfully hard to hold him. Once you spot one, if you take your eye off it, I'll give you odds that you'll lose it unless it's a perfect day. When we picked up a life raft, I would lose it unless I kept my eye on it while the copilot flew the place. You don't have any trouble with the crews once you pick them up. The fellows I picked up were pretty good. They're pretty scared and they'll do anything you tell them. To get a "Cat" (PBY) off the water you have to put the load up in front. You won't break water unless they're up forward. I landed one night about one o'clock contrary to orders and was almost court-martialed for doing it, to pick up the crew of a B-29 radar snooper plane. It had come up from Singapore, run out of gas, ditched, and floated for four days. A B-24 was circling him, as were two RAF "Cats." They had told me not to land on the water at night, but I did, so we pulled eleven men on board and one dead man. There was another dead fellow in the tail of the B-29, so I sent three of the crew members out for him. With a crew of ten, that made twenty-three. We had a tough time taking off. On the first trial, the ship yawed to the right, the wing float hit the water, and I had to try it again. After a run of about three miles, she picked up, but hit five times before we got off.

4. Maintenance on a "Cat" is anyone's nightmare. There wasn't a part in that theater. I had to fly 900 miles to get parts for the airplanes. A nose wheel tire on a PBY is a 30-inch tire. It's the only plane in the world that uses them, and there weren't any of them over there. The Dutch were using B-25 tires, which are the same size on the outside, but the PBY wheels are like doughnuts. I had six of them ordered, and I did get two, but I never used them. The hydraulic systems are bad. The pumps installed are no good. They take a 214 PA pestile pump which we changed to a bigger pump. The fuel transfer system up in the engineer's tower is always a source of trouble. We substituted a

B-25 system for the PBY system. The gas tanks leak, too. We had to tear every bit of radio out of the plane, beef up the bottoms, and put in new equipment. It took about two months on one plane and three months on another. We had to install new radio compasses. How those airplanes were ever passed by Army inspectors is more than I'll ever understand. They had Canadian radio compasses and radar equipment. We arrived overseas to find there wasn't one bolt that we could replace. It cost the Army the initial cost of that airplane to modify it.

5. There are a few other recommendations which I would like to make. (1) Fellows that are going overseas in PBY's are not getting enough water work. There's just as much difference between water and land flying as there is between an automobile and a boat. The Army doesn't have anyone who realizes what it's like to fly an amphibian. (2) Every amphibian unit should have one or two decontamination units to wash them off. In two weeks, if we didn't you could knock every rivet out. I borrowed a decon unit and was lucky enough to keep it. The outfit there now doesn't have one, and they need something with which to wash their planes. (3) There is a mixture called perakaton used to keep salt water off stainless steel parts, wheels, and fittings which can't be painted. It's a solution with a bees-wax base which looks like axle grease. You've got to have it to keep salt water from chewing up your landing gear. (4) The biggest trouble we had was that we couldn't get our enlisted men promotions because we were a detached outfit, and the 10th Air Force didn't hand them out. I was a 2nd Lieutenant twenty-one months. Finally made the grade last October.

Rescue cover provided by the British began to prove inadequate late in 1944, when XX Bomber Command missions were stepped up. Requests for more rescue facilities were met by stationing the British No. 212 Squadron at Karachi, with the mission of providing rescue aid in the Bay of Bengal and along the west coast of India. This proved insufficient, however, and the AAF 7th Emergency Rescue Squadron was activated on 25 January 1945.[62] Two flights of the 1st Emergency Rescue Squadron were deployed from Italy to serve as the nucleus of the new organization, which was authorized personnel and equipment under the provisions of T/O & E 1-987.* OA-10's, B-17's, L-5's, and PT-19's made up the squadron's aircraft.[63]

*See p. 71 for a description of this T/O &E.

Operational flying began in March, and the first month's activities included 43 missions and 16 rescues. Over one-half of the missions were flown over land areas, and land search and rescue became increasingly important in the following months as the India-based bombers moved to bases closer to Japan.[64]

In August 1945 the squadron was moved to Okinawa, but did not arrive there until after the end of hostilities.[65]

China. On 18 May 1945 the Air Search and Rescue Section of the China Air Service Command was established in Headquarters, XIV Air Force Service Command. The section was to be the control center for distress data in China, and in that capacity evaluated and passed on for action all distress information. The 8th Emergency Rescue Squadron was charged with carrying out the section's directives for search and rescue activity.[66]

Two days after this organization was formed, the first incident--a C-47 search operation--took place. The first rescue, on 27 May, was accomplished by three helicopters of the 8th ER Squadron. By 15 June six more helicopter rescues had been accomplished. From its formation until 10 September 1945 the rescue section received 138 reports of distress cases. Search operations were carried out in 110 instances, and 43 rescues were accomplished.[67]

The 8th ER Squadron was the only unit among those engaged in rescue activities in World War II to be equipped solely with helicopters and C-47 search aircraft. The mountainous terrain in which the squadron operated provided a thorough test of the helicopter's proficiency in rescue operations, and the results were extremely satisfactory. On the basis of helicopter performance in China, the Chief of Air Staff, Headquarters, AAF

was told, "Helicopters are proving an important addition to AAF emergency rescue facilities . . . this is especially gratifying in view of the fact that helicopters are now standard unit equipment for emergency rescue squadrons."[68]

Conclusion

The almost complete absence in the Pacific of any rescue facilities other than those provided by the United States was a unique situation for the AAF in World War II. Though rescue efficiency undoubtedly suffered thereby, this lack of outside support did serve the purpose of forcing the AAF to work out its own policies for air-sea rescue.

Navy control of rescue cover in the Central Pacific Theater, unsatisfactory as it was to the AAF, provided an opportunity to compare the merits of the AAF's desire for air force-level command over air-sea rescue activities with the Navy's preference for area responsibility. The results strengthened AAF determination to retain responsibility for air-sea rescue affecting its own personnel, and reaffirmed its belief that rescue responsibility in a combat theater should be assigned to that theater's air forces. The necessity of naval assistance in CENPAC also served to emphasize AAF shortcomings in equipment and maintenance.

The variety of conditions found in the Pacific Theaters and the CBI, from tropic islands and trackless seas to mountainous regions and jungle areas, afforded gruelling tests for AAF air-sea rescue equipment. The OA-10's and B-17's with airborne lifeboats were not found satisfactory. The seaworthiness of the former and the range of the latter were limited. The short range of the B-17 was overcome to a certain extent by assigning B-29's to long-range search duties, and experiments with equipping a

modified B-29 with an airborne lifeboat were under way by the Japanese surrender. The deficiencies of the OA-10's, which had always been considered an unsatisfactory though necessary makeshift, were not unforeseen, but the lessons learned from their use in the Pacific were of value in determining the desired characteristics of their eventual replacement.

Naval contributions to AAF air-sea rescue efforts could not be overlooked. Navy surface vessels and submarines were indispensable to rescue cover, and the importance of AAF--Navy cooperation in future rescue operations was emphasized by this fact.

Rescue operations in the Pacific thus engendered AAF over-all policies for rescue activities; served as a testing ground for rescue equipment (including the helicopter), and made it clear that air-sea rescue success would always be dependent on a close and friendly relationship with the Navy.

Chapter VI

OTHER AREAS

Introduction. Overwater flying by the AAF during World War II was not confined to the waters surrounding the United States and in the principal areas of combat. Air transport routes in the North Atlantic, South Atlantic, and the Pacific were constantly in use. Antisubmarine patrols along the coast of the United States, in the Caribbean, and off the coast of Alaska were flown by the AAF. In addition, the Aleutian Islands campaign involved numerous overwater flights. All of these AAF activities required air-sea cover, but it received it in somewhat haphazard manner.

Although the Air Transport Command's (ATC) Caribbean Division inauguarated an air-sea rescue service in 1943, and the Navy and AAF, acting jointly, took similar action in the Hawaiian region, no such systematic provisions were made in the Panama Canal area, Alaskan coastal waters, or the North Atlantic. In these regions much of the responsibility for air-sea rescue was placed on the operational units themselves.

Several explanations may be cited for this seeming lack of concern. In the North Atlantic the air route closely followed that of surface convoys. Constant air and sea protective cover for the stream of ships bearing supplies and personnel to the Allied forces in Europe made the establishment of a formal air-sea rescue organization superfluous. Two specialized rescue units were stationed along the great circle route, but these were

arctic search and rescue squadrons whose activities were concerned with the wastes of the ice-bound Arctic rather than rescue from the sea. The presence of large-scale naval concentrations in Alaskan waters and on the Pacific side of the Isthmus of Panama precluded extensive AAF air-sea rescue organizations in those regions. In the Caribbean and the South Atlantic naval facilities also figured in rescue planning.

Even where there was an obvious need for improved air-sea rescue services however, necessary equipment and personnel were often slow in coming. The global character of the war so strained the production and manpower resources of the United States that areas where the need was still urgent but less critical were sometimes neglected. The equipment supplied to emergency rescue squadrons even in combat areas was sometimes old and inadequate. Other regions took what was left when there was any surplus.

The Caribbean

The chief AAF air-sea rescue establishment in the Caribbean was organiz[redacted] ATC's Caribbean Division. The division's first step toward a rescue organization was the activation of an air-sea rescue boat unit at Morrison Field, West Palm Beach, Florida, on 26 February 1943.[1] The boat unit, a quartermaster boat comapny already based at the field, had provided rescue services since 1941, but its efficiency had been lowered by morale difficulties stemming from the use of mixed civilian and military crews, and by uncertainty over its assignment and mission.[2]

With the assignment of the unit to ATC its services were extended by stationing boats at key islands along the Bahamas, specifically at Cat

Cay, Great Exuma, Mayaguana, and South Caicos. These became checkpoints for aircraft traveling the route. Each plane was required to report by radio as it passed a checkpoint, giving its number, position, and altitude. Nassau was also a checkpoint, but since a British rescue boat unit was already established there, no AAF unit was needed. Expansion of the facilities at the four island bases began immediately. Permanent radio facilities and buildings to house personnel were put up on all four, and a landing strip was constructed at South Caicos.[3]

As an effort to provide directional guidance for rescue attempts, four carrier pigeons were assigned to each aircraft flying from Morrison Field, Florida; Borinquen Field, Puerto Rico; Waller Field, Trinidad; and Belém Field, Brazil. The experiment was in effect from January through July 1944, with inconclusive results. Theoretically, if a ditching became necessary, the pigeons were to be released with messages giving the position of the plane. In practice, the aircraft crews had little confidence in the birds' ability, often refused to accept them, and failed to use them if in distress.[4]

More efficient aid for distressed aircraft was afforded in August 1944 by D/F installations at Morrison Field; 36th Street Airport, Hialeah, Florida; Borinquen Field; Vernam Field, Jamaica; Atkinson Field, British Guiana; Barbados, British West Indies; Hato Field, Curacao; Waller Field; and Batista Field, Cuba. Airfields in Antigua, Dutch Guiana, French Guiana, South Caicos, and at Nassau were later added to the circuit. When a call was received from a plane desiring a fix, the ground station which received the message notified all other stations in the network, giving them the

necessary information. All stations then took a bearing and relayed the result to one of the three net evaluation stations at Miami, Borinquen, and Atkinson. The fix was plotted and the result given direct to the aircraft or relayed through the station which had received the original request.[5]

If a distress call requiring direct action was received, all planes and ground stations in the area were directed to guard the distress frequency of 500 kilocycles, rescue boats were alerted, rescue airplanes dispatched, and assistance requested from AAF operational units, the RAF, and the U.S. Navy.[6] An overdue AAF B-25 en route from Puerto Rico to Trinidad evoked a rescue search by 49 aircraft and 2 blimps. The search was abandoned on the eleventh day, after debris and a lifeboat from the plane were found on an island near Trinidad.[7]

By December 1944 the Caribbean Division rescue organization had four aircraft--two OA-10's, an OA-9, and a B-18 (an obsolescent bomber type). The amphibious craft were provided with radar equipment, and all planes carried AN/CRN-1 radio transmitters, to be dropped when survivors were found. These devices automatically ejected a fish-pole antenna on striking the water and began transmitting a continual radio signal that aided in guiding rescue boats to the scene. Surface craft assigned to the unit included eight 63-foot, one 45-foot, and two 22-foot boats. For operation in the shallow waters of the Bahamas, the boat unit preferred 63-foot craft to the 104-foot boats originally assigned. The larger craft had been exchanged over a period of time for those better suited to the operating conditions.[8]

The greatest difficulty faced by the rescuers was the shortage of rescue aircraft. This need was confirmed by the search and rescue statistics for the first six months of 1944. During that period there were 18 incidents in the Caribbean which required the use of rescue facilities. In seven instances no search was required, in two more the search was of short duration because they occurred near an airfield, but extensive search was needed in the other nine cases. Three of the aircraft sought for in the longer searches were found, but 6--all B-24's--were never located, and 61 persons were lost as a result. At the time these statistics were compiled the rescue aircraft numbered two, both OA-10's.[9] The request in November 1944 for seven additional planes--four OA-10's, one OA-9, one B-18 and one L-4--was therefore a reasonable one, but only two planes had arrived 45 days later.[10]

The Isthmus of Panama

Further west, AAF responsibility for rescue rested with the Sixth Air Force, charged with protection of the Panama Canal. But the major burden of rescue activities was borne by a Navy patrol wing which operated a search patrol on the Pacific side of the Isthmus of Panama. The Navy wing had 20 PBY's stationed at Coco Solo, Canal Zone (14); Salinas, Ecuador, the Gulf of Fonseca (1), and Santa Cruz Island, in the Galápagos (2). These planes flew scheduled search missions primarily for the purpose of finding and reporting any enemy activity that might be directed toward the canal, but they were also used for search and rescue.[11] Sixth Air Force

itself was assigned two amphibious planes in May 1943, but no aircraft specifically designated for air-sea rescue until the spring of 1945.[12]

Surface rescue facilities on the Pacific side of the Isthmus were provided by the AAF 12th Emergency Rescue Boat Squadron, activated in June 1944. This organization of 200 officers and enlisted men was equipped with antiquated 104-foot boats hardly suitable for their rescue mission. The subsequent assignment of 63-foot craft and new 85-foot boats greatly increased the squadron's effectiveness.[13]

The South Atlantic

Rescue operations in ATC's South Atlantic Division were not properly organized until 12 July 1944, when a full-time Wing rescue officer was assigned to the headquarters operations section.[14] As early as March 1943 three 104-foot boats had been allotted to the division, but the order was canceled before the boats left the United States.[15] Six months later a 63-foot rescue boat with its crew arrived at Natal, Brazil, but the crew's status was so uncertain that some months passed before it was finally assigned to the South Atlantic Division, and operational efficiency suffered during the period of indecision.[16] Meanwhile, in December 1943, four 104-foot rescue boats with crews arrived. Two were tentatively assigned to Ascension Island, one to Natal, and one to Belém, Brazil, but their assignments were not finally decided until the rescue unit was formed in July.[17]

When the question of operational control was finally settled, work was begun on a plan of rescue organization. The resultant division memorandum provided for a division rescue unit to control the activities of the base

[redacted]

units, a division rescue officer assisted by two rescue control officers--one for aircraft and one for boats--and base rescue officers who were to be in charge of both planes and boats. The equipment, still largely on paper, was to be divided between the three bases--at Natal, Ascension Island, and Belém--one OA-10 aircraft to be assigned to each. This allotment of equipment was based on the supposition that three additional boats and three OA-10's would be assigned to the division in the near future.[18]

The young rescue organization faced its greatest problem after V-E Day, as plans were announced for moving aircraft and personnel from Europe to the United States in preparation for use in the war against Japan. These plans were in three parts: Project GREEN, Project WHITE, and one labeled simply, Redeployment of Aircraft.[19]

Project GREEN involved the movement of 50,000 troops from the European and Mediterranean Theaters to the United States, using C-54's and C-47's. Forty per cent of the troops were to use the South Atlantic route; the rest were to travel via the North Atlantic. The movement, to be completed between 1 June and 1 August, would entail 26 daily round trips from Dakar, in French West Africa, to Natal by C-54's, and 31 round trips a day by C-47's from Natal to Miami. Project WHITE referred to the movement of 4,065 four-engine bombers from Europe to the United States. The similar east-to-west movement of two-engine aircraft was designated as Redeployment of Aircraft.[20]

The rescue plan adopted on 16 May 1945 to cover these movements counted on the Navy's cooperation in providing six destroyers: one to

be stationed between Roberts Island and Ascension Island, two between Ascension Island and Natal, and three between Natal and Dakar. Besides participating in rescue operations the destroyers were to take weather observations, monitor all traffic, and relay messages. The Navy not only agreed to furnish the destroyers, but also offered to provide three blimps which were operating in the South Atlantic.[21]

AAF rescue facilities included two B-17's, one crash boat and one OA-10 at Natal; one B-17, one boat, and one OA-10 at Ascension Island; one B-17 at Recife, Brazil; one B-17, one boat, and one OA-10 at the Brazilian island of Fernando de Noronha; and one boat and one OA-10 at Belém--a total of five B-17's, four OA-10's, and four rescue boats. Protected by these rescue facilities, a total of 52,449 troops passed through the South Atlantic Division in June, July, and early August. During the same period of time 4,076 aircraft passed through Natal. On 11 August Project GREEN was suspended when it became evident that a Pacific peace was close at hand.[22]

The Hawaiian Islands

Like Ascension Island in the Atlantic, the Hawaiian Islands were stepping-stones for planes crossing the Pacific. These islands had received the first blow of the war and were aware that another might be aimed in their direction. In view of these facts and the extensive military establishment existent on the islands long before 7 December 1941, it is surprising that a centralized air-sea rescue organization was not achieved until almost a year later.

On 5 October 1942 the Hawaiian Rescue Service Control was activated to coordinate AAF and Navy rescue facilities and direct rescue operations. Though the AAF and the Navy operated the service jointly, all personnel were provided by the Seventh Air Force.[23] During the early period of operation the control center was handicapped by lack of communication equipment. Only eight field and dial telephones were available, radio equipment for rescue boats was inadequate, and delays occurred because of the necessity of relaying all messages to and from rescue craft through the airfield tower.[24] A year and a half passed before these faults were completely eradicated, but by April 1944 the control center was equipped with 25 telephone lines, a radio transmitter and a receiver; and all rescue boats and two liaison planes had efficient two-way radios. Although conditions were not ideal during these first 18 months of operation, the Hawaiian Rescue Service Control directed 244 missions which saved the lives of 131 persons.[25]

Besides directing rescue operations, the Rescue Service Control was charged with providing information to lost aircraft desiring to know their position. An AAF three-station network was under its jurisdiction, and the Navy and Federal Communications Commission's networks (six stations each) were tied in by telephone. When a position request was received, the three networks were alerted, their findings correlated by the control center, and the position transmitted direct to the plane. In 1942 fixes of multiengine planes, from October 1942 to April 1944, it was found that an average 15-minute time lag occurred. The fault lay with the lack of a predetermined rescue communication frequency. If

all the planes had been assigned the same frequency, network operators could have maintained a constant guard on that one frequency and much of the lost time would have been eliminated.[26]

In the summer of 1944 the Army and Navy commands decided to separate the Rescue Service Control's two main functions. It was felt that both missions could be carried out more efficiently if each was the responsibility of a different organization. Accordingly, the Army Airways Communications System (AACS) assumed responsibility for aircraft-position reports on 31 August 1944, and Rescue Service Control was left to concentrate on direction of rescue operations.[27]

Concurrently with the loss of one mission by Rescue Service Control, the responsible authorities were formulating a plan for improved rescue operations which placed all authority under one command and extended rescue services into the Central Pacific Area. A study made in June 1944 by an Air-Sea Rescue Agency liaison officer concluded that the Navy was more adequately prepared than the AAF to undertake such responsibility. This report, submitted to the Commander, Hawaiian Sea Frontier on 28 June, pointed out that there were two areas of rescue operations within the Commander's zone of responsibility. The first of these, under the operational direction of the Rescue Service Control at Hickam Field, had a radius of approximately 25 miles. Available rescue facilities included two liaison-type planes and a number of Army boats operated by the 927th Quartermaster Boat Company. This area was further served by a number of naval air stations with rescue equipment consisting of either one amphibious plane and a boat, or a plane only. The Joint Operations Center (JOC) of Hawaiian Sea Frontier was also

near at hand. Action in this region could be initiated by the Rescue Service Control, local bases, or JOC.[28]

The second area comprised all that lay within the jurisdiction of Hawaiian Sea Frontier beyond the 25-mile limit surrounding Hickam Field. Here JOC was the controlling agency, but there were local Navy air stations at widely separated points whose facilities could be used for rescue within 25 miles of their own bases.[29]

The report continued with the assertion that, even with the best of intentions on the part of all concerned, the lack of a single air-sea rescue controlling agency for the Hawaiian Sea Frontier command inevitably caused delay. If an unknown aircraft were in distress in a local base area, the base rescue organization would probably not receive the alert immediately, since its radio facilities would be occupied with keeping track of its own planes. Delaying factors would also be present if the distressed plane were on the "border line" A base rescue organization might hesitate to endanger its rescue facilities if its responsibility was not clear. Even if JOC was immediately alerted and unhesitatingly accepted responsibility, it had only one plane available for long-range rescue, and that plane was also used for patrol duty. If the aircraft was out investigating a report of an enemy submarine, it would be unavoidably delayed in beginning a rescue mission.[30]

The report therefore recommended the establishment of a rescue task unit under the operational control of the Commander, Hawaiian Sea Frontier. Its mission would be:[31]

1. To respond immediately to all offshore crashes with a team consisting of at least one plane and one boat.

2. To relieve training and operational units of rescue responsibility.

3. To study and evaluate crash incidents.

4. To distribute rescue facilities.

5. To collect and pass on rescue information to JOC.

6. To maintain liaison with all other agencies concerned with air-sea rescue.

When a distress message was received, the incident would be reported instantly to the Control Center of JOC which would alert the aircraft and boat teams. This procedure would not prevent local facilities from taking immediate action, nor the dispatch of a direct alert to obtain rescue facilities, but it would be clearly understood that all operations were under JOC control.[32]

To operate the rescue service efficiently, it was recommended that the rescue task unit be provided with long-range patrol planes and amphibious aircraft, helicopters, and 63-foot rescue boats capable of a top speed of 33 knots, and a range of 550 miles at an average speed of 25 knots.

The report did not consider the possibility of any rescue authority other than the Commander, Hawaiian Sea Frontier. Its opinions were not immediately shared by all concerned, and a joint Army-Navy committee was appointed to study the problem and make recommendations.[33]

But there was little doubt that the Navy was much better prepared than any other agency to undertake the responsibility. Naval rescue equipment—boats in particular—was newer and better than that of the AAF.

In one instance a Navy boat was dispatched to the scene of a rescue 20 minutes after an Army boat, traveled twice the distance, and arrived 15 minutes ahead of the Army craft.[34] In view of the need to offer rescue service as far west as Midway and Johnston atolls, the Navy was also the logical choice.

The committee soon came to the same conclusion. Naval authorities had perhaps anticipated the result, and a plan for an air-sea rescue task group under Hawaiian Sea Frontier was submitted by 1 August 1944 to the Commander in Chief, Central Pacific Fleet.[35]

Despite acceptance of this plan, joint responsibility continued for the rest of 1944. AAF facilities grew, in fact, with the assignment to the Hawaiian Islands of the 13th Emergency Rescue Boat Squadron in December. By February 1945, however, the Hawaiian Sea Frontier Air-Sea Rescue Task Group was operating with eight PBY's, two L-5's, thirteen 63-foot boats, and other surface craft. Rescue bases had been established at the harbors of Honolulu and Kaneohe, Oahu Island, Hawaiian Islands; Puunene, Maui Island, H.I.; Palmyra and Canton Islands, H.I.; and at Midway and Johnston atolls.[36]

Alaska and the North Atlantic

Introduction. Air-sea rescue training and equipment in World War II did not vary greatly from region to region. In the arctic and near-arctic regions, however, conditions were such as to require a specialized approach. In two arctic areas--Alaska and the North Atlantic--the flying hazards were great enough to warrant the establishment of rescue organizations, but

in both regions the problem of rescue from the sea was complicated by the terrain and climate.

As an attempt to adjust rescue activity to these conditions, specialized personnel were trained at the Arctic Training School at Buckley, Colorado. Three arctic rescue squadrons were activated, serving in Alaska, Greenland, and the North Atlantic. This specialized training did not begin until the summer of 1943, however, and the personnel were not available for rescue service until the autumn and winter of that year.[37]

Alaska. Trained rescue personnel from Camp Buckley did not arrive in Alaska until December 1943. By that time, AAF forces in the area had already experienced the more immediate perils of combat, and the period of urgent need for rescue cover for combat missions had passed.

The Japanese assault on Pearl Harbor had aroused the fear of a similar attack on our ill-prepared military installations in Alaska. The expected attack, directed against Dutch Harbor, was beaten off, but American forces in Alaska were powerless to prevent the establishment of enemy bases in the Aleutian Islands chain, notably at Kiska and Attu. It was immediately apparent that these bases posed a threat that could not be ignored, and from the attack on Dutch Harbor until the Japanese were driven out of the Aleutians, U.S. Army and Navy commands in Alaska worked together to repel the enemy. Their success was achieved in large part with the aid of continual bombing, patrol, reconnaissance, and other air missions over large water areas and in unfavorable weather conditions.

Although the need for air-sea rescue during the campaign was obvious, there was very little planning done, and no Army facilities were ever

earmarked for the purpose. This seeming indifference is explained by the fact that naval airpower of a type suited for rescue work was present in the region. Thirty Navy PBY's, whose principal mission was patrol, provided rescue cover, and a number of naval surface craft were available. During the period of concentrated bombing missions on Attu, for instance, the PBY's were responsible for antisubmarine patrol, cover for ship movements, photographic reconnaissance, reporting of weather conditions, relaying of messages, and air-sea rescue.[38]

With the end of large-scale combat operations, air-sea rescue cover was still needed in Alaska for planes that were being ferried to Russia. Before a formal organization was created, rescue missions were organized on the spot. All available aircraft were called to the point where the plane was last reported, a search pattern was decided on, and the search began. There were of course definite disadvantages to this procedure. It required a considerable time to organize each search, there were no experienced personnel trained in search techniques, and the use of operational aircraft was wasteful. These missions were too often unsuccessful, and even when survivors were found, the search was usually an unduly long one.[39]

To remedy this situation, the Alaskan Wing Search and Rescue Squadron, ATC, was activated on 14 December 1943. The squadron was authorized 48 officers, 6 flight officers, and 165 enlisted men by T/O & E 1-618. Their authorized equipment included six liaison-type planes, four transport planes, two utility aircraft, six large and two small gliders, and four helicopters. The gliders and helicopters were never furnished, but by March 1944 the

squadron had eight C-64's and six small planes. In January 1945 two C-47's were assigned, and just before their arrival the squadron acquired two OA-10's.[40]

The squadron obtained its first sled and pack dogs in February 1944 and was operating snow vehicles by March. That same spring a small fleet began to take shape, and by 30 August over 30 boats ranging from 6-foot skiffs to a 33-foot cabin cruiser were available for rescue. A much larger craft, 85 feet long, had been assigned in July for use on the Bering Sea, but by the time the necessary modifications had been made at Seattle, the sea was frozen solid. The ship was brought north to Dutch Harbor, loaned to the 10th AAF Emergency Rescue Boat Squadron and later traded for a still larger, and faster, vessel.[41]

The squadron's area of responsibility was divided into Canadian and Alaskan sectors. At first the Wing Search and Rescue Officer was responsible for both, but in June 1944 that office was abolished, and two sector search and rescue officers were appointed. Flights were based at Edmonton, Fort Nelson, and White Horse in the Canadian sector. In Alaska they were situated at Fairbanks and Nome. In March 1944 three aircraft were assigned to each of the Alaskan bases and to White Horse. Edmonton and Fort Nelson had two each.[42]

Subsequent to the activation of the Alaskan Wing Search and Rescue Squadron, only two missing aircraft remained lost. The first was a B-25 from the AAF Cold Weather Testing Detachment, lost in February 1944 while the rescue squadron was still getting organized. The second was a civilian plane which disappeared in March 1945 on a flight from Galena to Candle,

both in Alaska. After an 8-day search the effort was reluctantly abandoned, but 20 days later the pilot walked into a camp 100 miles west of Candle, much disgruntled because the rescuers had not found him. He overlooked the fact that he had never filed a clearance, had not been given a weather briefing, and had omitted to maintain radio contact during his flight.[43]

The squadron was expected to accomplish a number of other missions unrelated to rescue. These included ferrying replacements to isolated outposts and dropping supplies to them, evacuating sick and injured persons, and carrying medical supplies and personnel. The records show relatively few air-sea rescue missions and those usually over inland lakes or bays rather than the open sea.[44]

One instance of air-sea rescue was a six-day search in July 1944 for an L-4 that disappeared on a mercy flight from Churchill, Manitoba, to an Eskimo village. The search region was outside the squadron's area of responsibility, but the Canadian request for aid was granted. On 12 July the missing plane was discovered on a reef in Hudson Bay, one mile offshore from the mouth of the Big River. A rescue PBY landed and recovered the pilot's body, but the doctor who had accompanied him was never found.[45]

A possible explanation for the lack of many sea rescue incidents in the history of the Alaskan Wing Search and Rescue Squadron was the presence of the AAF 10th Emergency Rescue Boat Squadron of 300 men, with headquarters at Elmendorf Field. Although the squadron had no aircraft, it maintained fourteen 104-foot boats which were capable of open-sea

operations, and 14 other boats of assorted smaller sizes.[46]

Despite the size of the larger craft, squadron personnel were dissatisfied with their performance. When new 63-foot boats began arriving in August 1944 there was temporary enthusiasm, but it was soon quelled by the discovery that their high superstructure made them hard to manage in a heavy sea, and that they were built from unseasoned lumber which warped and let the sea in.[47]

As ferrying operations declined, the necessity for rescue lessened. On 15 September 1945 the Alaskan Division (successor to the Alaskan Wing) turned its rescue organization (less personnel) over to the Alaskan Department, which presided over its dissolution. During the same autumn, personnel and boats of the 10th Emergency Rescue Boat Squadron were being returned to the United States.[48]

North Atlantic. There were no large-scale combat operations in the North Atlantic, but ferrying operations of even greater proportions than in Alaska created a need for air-sea rescue. This need was emphasized by several incidents in which valuable lives were lost.

The one which attracted most attention was the crash landing of a B-17 from the 2d Ferrying Group on the Greenland icecap on 9 November 1942. After escaping from the plane, the crew built a shelter under one wing, set up a radio set and began sending out SOS signals. On 24 November a C-54 sighted the party and dropped food, and four days later a Coast Guard amphibian landed and picked up two of the men. On 30 November two men from the Ice Cap Station reached the B-17 on skis and promised to return the following day with a motor sled. This attempt proved disastrous when one of the two-man rescue party fell into a crevasse and was never

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seen again. On 1 December the amphibian returned and removed one more man, but the rest of the marooned crew decided to stay and hunt for the would-be rescuer who had disappeared. The decision was a fortunate one, since the amphibian crashed on its flight to base and all aboard were killed.[49]

The search for the missing man was continued for a week with no result. At the end of that time the remaining rescuer and three of the B-17 crew started out for the Ice Cap Station with the motor sled. This effort also resulted in tragedy when another man was lost in a crevasse, and the entire party was stranded when the motor sled failed and bad weather set in. They were forced to dig in for two months until a PBY was able to land and rescue them. Life was sustained during this long period with the aid of supplies dropped from planes.[50]

In the meantime, the remaining crewmen at the site of the crash were also dropped supplies. To complete their rescue, three men and a dog team were landed five miles from the wrecked plane. They succeeded in reaching the B-17 and bringing the men to a point where a PBY could land, and all were finally removed from the icecap on 6 April 1943--148 days after the crash.[51]

In view of the length of the rescue operation a remarkable degree of success was achieved, but at the cost not only of lives but of an appalling number of wasted hours for the aircrews and equipment involved. If a specific rescue unit had existed, efforts to reach the survivors and take them to safety could have been coordinated, undoubtedly cutting down on the time and cost of rescue.

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The first efforts to establish rescue facilities on Greenland centered around a plan for establishing combination weather, rescue, and warning stations on the icecap. The attempt failed because of bad weather, inadequate supplies, insufficient personnel, and lack of cooperation from the Greenland Base Command. The report of the operation stated that adequate rescue facilities could more easily be provided from already established bases in Greenland.[52]

> From the investigations of the Ice Cap Detachment, as well as from the investigations and records of others, it is believed that it is not practical to establish a series of rescue stations on the Ice Cap. It has been demonstrated that a highly mobile rescue squadron operating out of the main Greenland bases can effectively and satisfactorily carry out rescue missions. A plane that is forced down on the inland ice is actually resting on a nearly limitless landing strip for ski planes. Rescue in such a case is a relatively simple matter, if ski-equipped planes are available for the operation. Planes and their crews forced down in the marginal zone may also be reached by mobile squadron units operating out of Narssarssuak, Sondrestrom Fjord, or Ikateq with almost as little expenditure of effort and nearly as quickly as from an outlying rescue station. It is believed, in fact has been demonstrated, that the First Arctic Search and Rescue Squadron is the answer to the rescue question on the Greenland Ice Cap.

In the fall of 1943, while the abortive attempt to establish rescue stations on the icecap was still in progress, personnel of the 1st and 3d Arctic Rescue Squadrons arrived in Greenland and Newfoundland. Two arctic rescue squadrons were formed under the jurisdiction of AAC's North Atlantic Division (NAD), and each was authorized 24 officers and 72 enlisted men.* Equipment included dogs and sleds, boats stationed

*The Newfoundland and Greenland Base Commands also maintained search and rescue organizations. There were nine operating units which were located at Presque Isle and Bangor, Maine; Manchester, New Hampshire; Goose Bay, Labrador; Gander Lake and Stephenville, Newfoundland; Ungan, Quebec, Canada; Fort Chimo, Province of Quebec, Canada; and Upper Frobisher, Baffin Island, Canada (Gould, Oron P., The Development of Rescue and Survival Techniques in the North American Arctic, p. 41).

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along the ferrying route, PBY's, B-17's with droppable lifeboats, C-47's, and C-64's. On one occasion a helicopter was used for a rescue operation, but it was obtained from Floyd Bennett Field, New York.[53]

A comprehensive search and rescue plan was prepared. Search was initiated as soon as an SOS or a report on missing aircraft was received. If the position was known, search planes flew a grid pattern at that point; if it were not, search was begun at a distance from the last known position based on an evaluation of the amount of gas remaining in the distressed plane. Ice and snow made identification difficult, and if the first search was unsuccessful, it was followed by another at a lower altitude. When the missing plane was found, the search aircraft landed if possible, or supplies were dropped and a fix requested from D/F stations. If the distressed crew was in the water, a surface craft was directed to them, a PBY landed, or a lifeboat dropped from a B-17. If a land rescue had to be effected, a small aircraft, dog teams, or snow vehicles were used. Greater emphasis was placed on air-sea rescue in Greenland than in Newfoundland partly because there were many lakes on which a PBY could land. Even if the distressed plane crashed on land, trail parties could often be transported by PBY to a lake near the point of rescue and the survivors in this manner removed more rapidly.[54]

The squadrons performed a variety of functions besides rescue. Supplying outposts, evacuating the injured and the sick, aiding natives in distress, and convoying ships that were in trouble were a few of their additional duties. In addition search procedures were studied and evaluated, and the Greenland squadron manufactured kits to be dropped to distressed personnel.

After the end of the war the NAD rescue squadrons relinquished their functions and were inactivated.[55]

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Introduction. [illegible] centre.

[illegible] 1952 [illegible].

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[illegible] in c[illegible] their [illegible].

[illegible] [illegible] also provided [illegible] C-1 vest, [illegible] life [illegible] C-1 [illegible] [illegible] [illegible] woolen [illegible] (fluor[illegible]); [illegible] whistle; first-aid kit; [illegible] flare. [illegible] articles, [illegible] [illegible] [illegible] [illegible].

[illegible] C-1 vest, [illegible] Several [illegible] vests [illegible] A-1, [illegible] water-resistant [illegible] [illegible] I-3 [illegible] P-4. The I-3 had [illegible] of cotton. [illegible] compartments [illegible], and a [illegible]

[redacted]

[redacted]

[illegible] cylinders [illegible]

[illegible] CO2 [illegible] Unfortunately [illegible]

[illegible]

[illegible] C-2, [illegible]

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[illegible] (Very pistol); [illegible] signals; [illegible] yellow [illegible] (one [illegible]); air [illegible] [illegible].

[illegible] "Gibson Girl" [illegible] to [illegible] 500 [illegible] Girl [illegible] period [illegible] -filled balloon in the emergency kit. Criticism still [illegible] of the length of time required to [illegible].[7]

An [illegible] Gibson Girl, the AN/CRT-3, was the [illegible] to broadcast on either of [illegible], 500 kilocycles or 8,280 kilocycles. It was [illegible] model and was capable of [illegible] D/F stations on [illegible] the 500-kilocycle [illegible]

[illegible] the [illegible] location [illegible] 2,000 [illegible]. [illegible] frequent [illegible] which joint [illegible][8]

[illegible] to [illegible] their location, they were provided with [illegible] reflectors, [illegible]-137A[illegible], and a device [illegible].[illegible] With these devices [illegible] circles were [illegible] 1944. The corner reflector [illegible], collapsible [illegible] on a collapsible [illegible] loosely woven [illegible] cloth. [illegible] for radar equipment. [illegible] revealed [illegible] could be seen on radar equipment for as far as 10 to 20 [illegible] under certain conditions, [illegible] maximum distance [illegible] 15 [illegible]. In [illegible] efficiency for use [illegible] in a life vest, the reflector [illegible] mounted on a [illegible] (a small [illegible] water), [illegible] readily detectable [illegible] of 7 miles [illegible] plane flew at an altitude between 500 and 1,000 feet.[9] Although the latter test seemed to indicate [illegible] of the device as items of individual [illegible] equipment, the U. S. Navy [illegible] declared that corner reflectors were of [illegible] aircraft [illegible].[10] [illegible], the AAF often included the reflector [illegible] C-1 [illegible]. This was possible because it [illegible] 20 ounces and measured only [illegible]x3 inches when collapsed.[11]

[redacted]

[illegible]Walter," a life-boat radio developed by the British, [illegible] range of 45 kilometers. Although tests [illegible] indicated that Walter was superior as far as maximum range of detection was concerned (25 to 30 miles over an [illegible] of 5,000 feet), the committee preferred Mallory's radio. Mallory's visibility curve, though [illegible] Walter's on the radiator; detection of Walter was [illegible] while the Mallory detector could maintain a range; Walter's operational life was 40 hours, while that of the Mallory was [illegible]; and Walter [illegible] in its emergency.[11]

The signal beacon receiver, [illegible], consisted of metal [illegible] mounted on a bulkhead next to the life boat. They were said to be [illegible] directly, but detection was uncertain and the [illegible] report.[13]

Of all the devices for [illegible] ocean [illegible] of distress (such as [illegible] were [illegible] to the Gibson Girl, signalling mirrors, [illegible], flares, [illegible] the radio was the most [illegible]. Its potential [illegible] by the radio was at times [illegible] maximum distance of 870 miles, but other instances of [illegible] range included 7.0 miles, 420 miles, 190 miles, and 110 miles. [illegible] of [illegible] was illustrated by the report of a distress incident of 9 May 1944 in the South Atlantic between a Mallory, Gibson Girl, and Aircraft Radio. Contact was maintained when the [illegible] occurred, and it was possible to transfer the Gibson Girl to the life boat. Four days and eight hours later, the distressed crew landed in their life raft, after [illegible] had been out of [illegible] to

attract their attention. When sighted on the fourth day, a search plane spotted the raft and dropped a marine beacon. On the sixth day a surface craft was able to locate and pick up the survivors after homing on the Gibson Girl signal.[14]

Although all radio sets for the Gibson Girl beacon could be received on a variety of airborne and land-based receivers, a radio-receiving set (AN/ARR-6) was specifically designed for the reception of distress messages. This device (first tested in April 1945) was chiefly received any message on the Gibson Girl frequency (500 kilocycles). Installation of the set precluded the danger of a plane's being unaware of the presence of a distressed aircraft near by. Not only did this set receiver provide an unfailing monitor for distress signals, but it also drew attention to reception of a message by means of a flashing red light mounted on the pilot's instrument board. The set was small, only 225 cubic inches, and light, weighing 5½ pounds. It had an operating range of from 200 to 400 miles.[15]

The radar detection device used in the corner-reflector tests at Mitchel Field, and commonly used in rescue aircraft, was known as air to surface vessel (ASV) radar equipment. It operated on a frequency of 176 megacycles and worked best when an auxiliary beacon was installed on the object to be detected. Radar and the corner reflector both produced favorable results when used with ASV.[16]

Rescue organization equipment: aircraft. Air-sea rescue craft were equipped with a large variety of emergency kits. In 1945 a rescue B-29, long-arm aircraft used for rescue, carried large life rafts, raft-recovery kits, air-sea kits, emergency-exhaust kits, Gibson Girl

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bandages, and a surgery-dressing kit. Six grenades, which were dropped to mark the area in which survivors were found, were also included. Two rafts, designated as A-1 and A-2, had a capacity of 4,500 pounds and were dropped from the bomb bay of the rescue plane. Other rescue aircraft, B-17's and B-24's and C-47 cargo-type planes occasionally used, were similarly equipped. The submarines and all other Army Air Forces were fitted with parachutes and dropped through the bomb bay or from the cargo-loading door if the aircraft was not a combat-type plane.[17]

A typical emergency-maintenance kit, the A-5, was packed in a large wooden box covered with yellow canvas. The A-5 included the following items:[18] 24 packages of Army ration type K; first-aid kit; sealing wax; boric acid ointment; flashlight; pocket compass; two flare pistol cases; bandage bandage; hand axe; razor; two large candles; fishing kit; six red flare candles; tarpaulin; two cans of sea marker; and 50 cans of drinking water.

Another emergency kit, the A-11, designed to supply the needs of 6 survivors for a short time, contained:[19] compass; notebook; 2 caps; fishing kit; air-sea kit; gloves; 4 first aids; 6 pistol holsters; knife; electric searchlight-type flashlight; survivor's manual; signal mirror; tarpaulin; pyrotechnics projector; 12 life-raft rockets; sea marker; 4 signal flares; sponge; sunburn ointment; whistle; marker; and mirror drift.

Air-sea rescue gear, type A-1, like the emergency-drop equipment developed by the British early in the war, consisted of three interconnected cubes mounted on a parachute. One of the units contained a life raft, and the other two held first aid supplies, survival

[redacted]

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and rescue purposes. Forty-five liters in all would be placed.[20]

An over-the-side ejector in the cockpit would permit continuing contact with the survivors after the initial discovery of their location. Two life lines were provided to assist in this task, but their effectiveness was limited only to aerial photo. In the air or on the deck it would be necessary that the actual pick-up of both the aircraft and the crew be reported. One solution was a single-tube, twenty-pound, low-frequency radio transmitter (AN/URC-1) that could be installed into the radar reflector space. A six-foot "whip-ball-type" portable antenna that could be the transmitter it would normally be used during a rescue signal while stored as a backup device for any aircraft or both in the cockpit or pilot. A bilge pump could be used before the ejector was employed to eliminate the time that break-in would be in. By turning the knob, the pump could be adjusted so that break-in time would begin from 10 minutes to 12 hours after the crew. Continuous operation over a 12-hour period is assumed.[21]

A similar device, to be carried in the aircraft cockpit itself, came to be developed in 1954. This was the crash-locator beacon, an automatic electronic device designed to transmit distress signals. It contained its own electronic device and power unit. If, after the aircraft had come to rest normally ejected before the crew or ejected, it was automatically thrown up into the air at the place of the impact. The parachute then lowered the beacon to the land or water surface, on which it was anchored, and broadcast distress signals until run down completely.[22]

[redacted]

Development also underway included recovery and D/I equipment to be used with the crash-locator beacon also in progress in 1952. An airborne H/F receiver and homer would also be used with the beacon, as would a rechargeable sub-miniature battery for use on ground rescue parties.[23]

Other research aims in the development effort in 1952 were an ultra high frequency (UHF) homing adapter, an all-range receiver with night homing equipment and a search-light beacon, all strategic air-craft-identification equipment, and an airborne public address system to be used for giving directions to survivors.[24]

A significant development in rescue equipment during World War II was the airborne lifeboat. First used by the British, the idea was accepted by the U. S. for use with the B-17 and the B-29. The A-1 lifeboat, carried by the B-17, was an inflated rubber craft, five-eighths of an inch thick. This was strong enough to withstand winds of 10 miles an hour and 20-foot waves. It was 27 feet 6 long with a 7.5-foot beam, and contained 20 material kit or packages. The boat had two air-cell chambers that operated independently. Each was capable of moving the boat at five knots, and, with both running, a speed of eight knots could be attained. Its cruising range was 500 miles. The boat was attached to the B-17's dorsal structure at four points, and released by the celestial control-valve lever.[25]

When the boat was ejected, three bi-metal parachutes opened, and 400-yard rocket lines were ejected as life lines and sea anchors when it struck the water. Self-righting chambers, automatically inflated with carbon dioxide, enabled the boat to turn right side up. Located in each

back rations, water, and clothing for 12 persons for 20 days.[26]

To combat the 4-week provision of 30 cans of water, there were 30 disabling kits, and the salt-water stills provided to each carried collectively enough salt water to replace those in operation. Food items consisted of 120 lifeboat rations and 20 life raft rations. Each lifeboat ration provided two meals for two men for one day. Life raft rations contained candy, chewing gum, vitamin tablets, and breakfast for one person for one day. Can openers were provided, as cans could be heated by placing them on the salt-water stills. Clothing kits included 10 raincoats, 2 pairs of boots, 12 pairs of socks, 24 caps, 12 pairs of pants, and 12 belts. Other kits for personal comfort were five cartons of cigarettes, three cartons of gum, salt-water soap, eight blankets, and four air mattresses. Other equipment included:[27] 8 oars; 2 flashlights; 4 containers of carbon arcs; 2 scoops; 1 sliding kit; 10 water bags; 2 containers of blood plasma; 1 first-aid kit; 1 sea-dye pack; 3 containers of sea markers; 10 smoke signals; 1 bell kit; 1 bermuda (yellow on one side, blue on the other; if used to attract attention, the yellow side was placed up; if used for camouflage, the green was reversed); pistol instructions; navigation instructions; and survival booklet.

Placed in special compartments in the boat itself were many other items. A radio kit, a jib, and mast and rigging were provided. To simplify identification, the various parts of the sails and rigging were marked with identifying colors, which were referred to by appropriate instructions. The survival booklet contained such typical directions

[redacted]

as: "Stow this object so that it will be the first in the bird corner of the dib." Oars and crutches, a sea anchor, a taffrail log with log line, a fixed compass and two hand compasses, a clock, a fire extinguisher, a bilge pump, and a radio with antenna wire also part of the lifeboat equipment.[23]

After the survivors succeeded in attaching the lifeboat, they were instructed to right it by pulling on, and opening one of the inflation tubes to let the air escape. Once righted, the centerboard was put in place, the rowlocks (which acted as stabilizers during the parachute drop) were positioned, and the rudder placed in position. In this way a favorable tide the sails could be assembled and hoisted; if not, the engines were started with the aid of an instruction booklet. Meanwhile, one of the remaining hand radio electronic operators, observing either land or a course (usually given by the rescue aircraft), and an inventory of the available survival kits was taken.[29]

The A-3 airborne lifeboat was designed for use with the B-29. It was larger and wider than the A-1 (30 feet 9/10 inches x 6 feet 8 inches), of all-metal construction, dropped by one rather than three parachutes, powered by one rather than two inboard engines, and carried provisions for 12 men for 30 days, but was otherwise similar to the A-1. Other than they were similar to that carried in the original airborne lifeboat.[30]

In 1952 service put on a third type of lifeboat, the A-4, was born. The A-4 would be an airborne, self-righting, personal lifeboat that could be dropped at an altitude of 25 to 100 feet into the sea at a maximum speed of 150 knots. The A-4 would be carried externally on bomb racks attached to the wing, or internally in the

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co b re'e of aircraft capable of carrying 2,000-pound bombs to b lecte. ...e bomb would be collapsible and self-inflating, so that it could be dropped in a collapsed state and would inflate on reaching the water. Electronic control from the air would be possible with the new bomb. It would carry sufficient fuel and equipment sufficient to maintain eight men for five days.[31]

Other considerations against aircraft and bomb. During World War II the place most used for air-sea rescue was the B-10. Although considered obsolescent even then, it was the best plane available because of its maneuverability, its slow cruising speed, its range, and the ability to take off and land on very rough water. The B-10 had a cruising speed of 120 knots, slow enough so that careful scanning of search areas was not hard. Its range made possible a search radius of as much as 600 miles, requiring seven or eight refuelings except for long hops to bases in the Pacific.[32] The Navy rated its PBY (equivalent to the B-10) as best capable of open-sea landings and take-offs in small numbers of the aircraft available.[33] Although this aircraft has not been considered suitable for use without fighter protection, any instances of successful landings and take-offs in such circumstances are recorded.

The principal defect of the B-10 as a rescue plane was its inability to rescue survivors under adverse weather conditions. To provide rescue facilities in such a situation, the Air Force purchased the P-17.

This aircraft was to be a modified version of the B-17 then used for rescue, but based on the design of the B-10, with a cruising speed of 160 miles per hour [illegible]

[illegible].[24] Electronics, however, was a field that did not seek effective search. Also, with the introduction of the very heavy B-29 bombers in the Pacific combat theater, and the requirement of extremely long-range bombing missions, the B-17's could no longer provide escort over almost the entire route of attack. The reason was that the B-17's and most of the other early long-range bombers were a dismal failure. The B-29 proved to be the ideal bomber for this role but it was not available in sufficient numbers (see above) to be employed in World War II to enable the B-29's to carry out all the mission capabilities of the B-17.

Cargo aircraft did quite well but were not called upon to perform combat missions in World War II. In the Pacific theater they were limited to search, transporting emergency equipment, and evacuating the casualties of carriers. Amphibian aircraft were occasionally used, especially in the ETO, but mainly to perform search and rescue missions, although they provided a little record of more emergency equipment. Liaison-type aircraft were required to each World War II base of operations, but the type of utility was in fact never except for locally [illegible] aircraft within short range of the parent base. In the primary combat role, because of their ability to fly into and unprepared areas, as in land rescue.

The emergency equipment used by each squadron in World War II varied from one 10'-foot [illegible] to one inflated plastic craft. In general, however, there were three classes of rescue service equipment varied from 10½ lbs to 25 lbs, 63 lbs to 4, and 142 lbs. The 1 lb type usually consisted of a life vest or life preserver. The 4 pound type consisted of a life vest and a one man life raft. The 25 pound rescue

[illegible] squadron [illegible] aircraft [illegible] [illegible]-
[illegible] capable of [illegible] up to 500 [illegible]
[illegible], [illegible] up to 200 [illegible] of 35 [illegible]. [illegible]
[illegible] of aircraft, [illegible] ability of [illegible] B-17's and B-29's to [illegible],
[illegible] to survivors, [illegible] the reception of helicopters
[illegible] rescue craft, [illegible] air-
[illegible]. [illegible] this decision was the in-
ability of [illegible] rescue [illegible] in [illegible] -
[illegible] in 1944-45.

In the period [illegible]
[illegible] air-sea search [illegible],
the [illegible]-10. Originally [illegible] "amphibian" with the
[illegible] of [illegible] and [illegible]. [illegible]-10 [illegible]
[illegible] crew of four—pilot, co-pilot, [illegible], and radio
[illegible]. [illegible]. In [illegible]
[illegible] of 12 [illegible] or 10 [illegible]. The cruising
speed [illegible] 125 miles [illegible] 217 [illegible]
[illegible] level. The [illegible]-10's low stalling [illegible] of 79 miles per hour in-
creases [illegible] efficiency in [illegible] search, [illegible] the ability to fly at
[illegible]. Its cruising range of 2,700 miles [illegible]
[illegible] effective search [illegible] of over 1,000 miles. [illegible]
[illegible]-10 [illegible]
[illegible] (J-10) [illegible] each side of the cabin. [illegible]
can be [illegible] to the [illegible] inside.[35]

[illegible] air-sea [illegible]

[illegible] the successful development and production of the helicopter. Its characteristics not only enabled it to perform rescue missions with greater dispatch than did fixed-wing aircraft or lighter-than-air craft, but also opened new possibilities for rescue efforts: the removal of personnel from behind enemy lines and the speedy evacuation of wounded men from front-line positions. Because of this effect on the concept of search and rescue operations, the story of the development of this unique aircraft is of interest.

Army interest in the helicopter dated as far back as 1918, but research in the early 1930's was limited by appropriations of $2,000,000 for development of rotary-wing aircraft of whatever kind was chosen.[36] Impaired by this meager level of financial support, the group created aircraft satisfactorily in 1940. The first one of its kind, the YR-1, built by the Platt-LePage Aircraft Company, was not satisfactory, nor were later models produced by the same company. The Vought-Sikorsky aircraft was more successful. The XR-4, built in 1941-42 (modeled on Sikorsky's VS-300, made five years earlier), achieved the prescribed Army standards and, with modifications, was the craft used during World War II. It was a two-place single-rotor plane with an auxiliary tail rotor to counteract the torque reaction of the main rotor. It weighed 2,100 pounds, had a 165-horsepower motor, and could do 90 MPH. On the ordinary fuel load of eight hours, the aircraft could be flown at a speed of 80 miles per hour, a maximum ceiling of 11,200 feet, and a cruising range of 382 miles.[37]

Production was to be almost entirely rotary aircraft.

...ated, the XR-4, ...and produced a total of ... by the ... power. In April 1942, 13 of ... were ordered, ... first delivery under contract was made in July 1943. Sixteen YR-4's were eventually required by the AAF, ... of which were sold to China for lend-lease purposes.[38]

The XR-5 was a larger model of the ... Sikorsky helicopter. The ... a value of ... horsepower, and its gross weight was 4,900 pounds. ... could be carried at a speed of 125 miles per hour to a height of 15,000 ft, and it was capable of sustained ... for over four hours. Between 1942 and 1944, 210 of these planes were ordered by the AAF, ... the U. S. Army ... and the U.S.N. All were delivered by 1946. A third ... helicopter, ... the S-6, ... a top ... of 95 miles per hour, a range of 400 miles, and a ceiling ... of 13,000 ft. ... 156 helicopters of ... model had been delivered to the AAF by December 1945, ... old rotary, ... obsolescent, ... have ... shall ... ; ... in the spring ... of 1946.[39]

During the years 1942 to 1946, at least 342 helicopters were delivered to the AAF. ... of ... were ... carried ..., ... their ... ... locale, but a large number ... could ... for ... use. ... only ... ... and these ... were not used for rescue ... 1945, however, a ... group ... for ... rescue squadron included ... helicopters. ... ... Inspectors in the ... carried ... their ... ... for ... ..., and by 1950 ... were ... on ... part of ... equipment.

... for helicopters ... their ... ... by the

development of the Sikorsky H-19 and the Piasecki H-21. The former, capable of carrying 8 litter patients, an attendant and pilot, or a crew of 4 with 10 passengers, was in use before 1952. The H-21 was slightly larger and could carry 12 stretcher patients and 2 crewmen including the pilot, or 14 passengers and a crew of 2. Delivery of the H-21 was scheduled to begin in 1952.[60]

Many suggestions for new rescue equipment and improvement of existing gear came from personnel who spoke from aircraft experience because they either served in an overseas rescue organization or had themselves been rescued from the sea. Many pointed out that radio and other signaling equipment--pyrotechnics and lasers, radar reflectors for life rafts, and radios for individual use. It was suggested early in the war that crew-man dinghies should be provided for all flying personnel. It was also urged that shoulder harnesses be provided for pilots and co-pilots, whose duties prevented their crew brothers themselves against the shock of a crash landing or ditching.[61]

A good deal of the criticism from rescue personnel centered on the OA-10. Its hull was frequently characterized as 'too weak' for open-sea landings.[62] However, one pilot, a veteran of 65 rescue missions in the Mediterranean theater, expressed the opinion that the plane was overrated. Despite the Navy's contention that 5 open-sea landings was the maximum allowable before an overhaul, he stated that his own plane had made 27 before this was necessary and he thought at least 20 sea landings could be safely made between overhauls.[63] This point of view was shared by his others. The OA-10 was further criticized because of

[redacted]

the difficulty in getting an injured survivor from a life raft into the plane, and the rescue equipment was reviewed to see if "practical" improvements could be made.[66]

The basic criticism could be overcome by the subsequent changes and additions made in rescue equipment. The use of one-man life rafts by bomber crews, and additional signal devices--including improved missiles and radar reflectors--were gradually developed. In replacing the B-10, the B-18 credited by the criticism directed at its predecessor. In many other improvements, its hull was shorter, its radar equipment more dependable, and a ladder was placed on the fuselage to aid in rescue from the sea.

Emergency Procedures

As the pilots of the earliest air-sea rescue operations in World War II, it was an axiom that one of the most difficult parts of the problem would be the inability of survivors of a distressed craft to aid in their own rescue, due to inadequate training in emergency procedures. The training and equipment of rescue organizations was worthless if certain crews did not receive notice on the proper emergency or be in distress, or failed to present their plight adequately for the attempt, or were without the equipment designed for their use. Rescues were made under such circumstances, but lives were lost which could and should have been largely recoverable, and in almost every instance there were casualties which could have been avoided if the proper procedures had been followed. Some accounts of such incidents have already been given in Chapter II. Many more could be cited, but one number instance may be sufficient to point the need. In the emergency landing of a B-17 in the Arctic

entered in Dec. 1943, [illegible] service hours, all at 100 lbs per hour. His position was transferred to his crew boss both. As a result, the plant broke into four production crews. The line mainframe shops [illegible] the plant incident in the department provided, in particular, to an unusual [illegible] on their given because of previous records in which a previously carried mark had broken loose on the car and scaled the tail surface of this plane. Consequently, only [illegible] were removed and no other equipment. [illegible] 10 knots be included in the record in this interval 3 men arrived. [illegible] ing of the right [illegible] were moved and they had had no brushes or brush, in their [illegible].[45]

Specific [illegible] central location to substantial study of the problem. The installation of brushes [illegible] of instruction would bring [illegible] results. Prompt [illegible] successful process in every shipper record only to secure improved equipment and increase [illegible], the [illegible] to their work of the interference to their own cabinets below, under, and after [illegible].

Because of the difficulty in these instructions, shop procedure in 1944 for [illegible] in the [illegible] which may be called as typical.[46]

Specific note for procedure [illegible] with [illegible] used in the [illegible] B-17's, B-24's, B-29's, A-20's, and single-seater aircraft. [illegible] included include instructions for each [illegible] in the [illegible], [illegible], and after the [illegible]. Brushes and washers were prepared by [illegible] the [illegible] of the motor [illegible] in practice

...ors. In addition, the ditching characteristics of the plane were publicized.

The B-17 was considered to have such "excellent ditching characteristics" that if used and ditched properly, it might stay afloat for as long as 30 minutes, which was ample time for escape.[47] Instructions for the B-17 crew follow: the pilot, after giving his crew ample warning while at as high an altitude as possible, and his intention to ditch, was to send an SOS on the established air-sea rescue VHF channel, fasten his safety harness, and tighten or close his window. He was then to decide on the direction of approach, guided by the swell of the wind. If the wind velocity was over 35 miles per hour, the approach was made into the wind. If the wind was blowing at less than 35 miles per hour, the direction of approach was made parallel to the crest of the swell. Later ditching was made at sea level as one of the most difficult tactical maneuvers faced by a pilot. He was only given general instructions to aid him, primarily based on the experience of the sea. In short, the pilot was to approach, the wind was probably blowing at a rate of 10 to 20 miles per hour; in white caps there was more, the wind velocity was probably 20 to 30 miles per hour. Streaks of foam showed the water indicated a comparable rise of 20 to 40 miles per hour, and if spray was blown over the top of the waves, the wind was blowing over 40 miles per hour. Having set his direction of approach, the pilot was to touch down as in a normal three-point landing at the lowest airspeed possible, using power and flaps to aid in his approach and check his speed. If the operation and touch-down were so clocked as perfectly as

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possible, there are two ways: When the bail-out bell sounds, everyone of the plane climbs into the center. All five ends before the touch-down, the pilot has to warn the crew to "brace for ditching."[16]

After the initial warning, one would hear over the intercom, the other crew members to jettison equipment such as unused bombs, rocket tubes, cartridge boxes, and other articles that might injure them at the time of impact, clear the radio channels, turn off the power boxes, and destroy classified material. The radio operator was to begin broadcasting an SOS as soon as he received the message and the pilot was to remain until it was necessary to place himself in the ditching position. Then he was burned as the engines position and left on.

Before the touch-down, all crew members except the pilot and co-pilot were to be placed in the center section, with parachutes and Mae Wests for padding. The co-pilot, having checked or jettisoned his other things, was to stand in the door. The tail-gunner was to remain in his turret until the plane was in the water. Then he was to open his turret hatch, climb out on the wing, and join the pilot's crew just behind the co-pilot. The radio operator was to climb out on the right wing, and the radio gunner was to climb out on the left wing, and both were to help the pilot to the life raft. The crew members in the pilot's compartment were to climb out on the wings, and the life raft was to be thrown to the left wing, and the crew was to help the pilot into the life raft. The crew members in the center section were to climb out on the wings, and the life raft was to be thrown to the right wing, and the crew was to help the pilot into the life raft.

or the ordnance supply, and the latter by pilot.[49]

In B-24 the gunner's duties were more complex. In addition to manning one of the power turrets, he had to operate the "Emergency Valve" by means of which the pilot could release the bomb load in case of emergency. The flight engineer stationed in the B-17 was also responsible for the B-24 gunner. Because of the location of the two bomb bays, only three crew members were to man the ship's guns, with their location changed according to the mission. Two defensive crew members were to be split up, either in crowded positions over the bomb bays. Two gunner duties were vague, certain crew members were assigned to leave by one hatch, two by another, and parachutes were put on and taken off in the lighter areas. All members were trained in the B-24 during recommended for those occurrences in which of necessity the normal plan.[51]

Ditching procedures for the B-24 and B-29 did not differ appreciably from the B-17, all of which the B-29 is more efficient than the previous model and is able to hold out.[52] The single-engine turning of the standard procedure was not to alter it to hold out, because their high speed and other surfaces caused it to break up and sink rapidly. Under such circumstances procedure, each member pilot had only to maintain sufficient altitude, because it was CTS on the VHF emergency channel, and leave the plane. His life vest would keep him afloat until he was able to climb on the crew-man life raft or to his crashboat crew.[53]

Preparation of crew's combination ditching instructions was by a crash ship bomb saving laws. The instructor's duty consisted to say, no soldier was difficult to remember after the strain of a long

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[illegible] in which [illegible] to the plane [illegible] occurred, and injured or dead crew members [illegible] rapid adherence to the SOP. In the course of practice for a crash landing under such conditions, the decision as to which equipment to [illegible] often difficult and sometimes capricious (on one occasion it was discovered that an overenthusiastic crew member had jettisoned the Gibson Girl radio). [illegible] to leave the plane in "an orderly manner." Actual practice was therefore [illegible] emergency activities [illegible] to the crew. [illegible], both in combat areas and in the Zone of Interior, to carry on such training, and the combat crews of 1944 and 1945 undoubtedly profited thereby. However, under the pressure of training [illegible] it is certain that most crews were not given sufficient instruction in emergency procedures to make their responses automatic in case of distress.

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Chapter VIII

POSTWAR PLANS, ORGANIZATION, AND TRAINING

Planning. During World War II jurisdiction over air-sea rescue activities had never been clarified. The AAF had assumed rescue responsibility for its own personnel in spite of objections by the Navy and the Coast Guard. In combat areas rescue organizations had been improvised, and aid obtained from other sources when it was available.

In the last year of the war air-sea rescue planning based on General Arnold's memorandum of 5 August 1944* had resulted in the publication of AAF Regulation 20-54, effective 1 March 1945. It designated three areas of rescue activity: the United States, covered by the four continental air forces; overseas areas, entrusted to the overseas air forces; and transport routes, which were the responsibility of the Air Transport Command. ATC was to operate rescue agencies along its routes; the air forces--both continental and overseas--were to establish emergency-rescue control centers within their assigned areas.

Cooperation with the Navy continued to be a basic policy. A letter from Headquarters, AAF directed AAF commanders to cooperate with naval commanders in preparing a common emergency-rescue plan for each area, and to collaborate closely with the Navy in all rescue operations. It was not considered advisable, however, to establish joint operations centers. The Navy issued similar instructions to its commanders.[1]

Even as AAF Regulation 20-54 was being prepared, the question of rescue responsibility was again raised. The Coast Guard was the agency

*See pp. 5-7.

most often advocated as best suited for the task. AAF opinion, however, continued to favor retention of responsibility within its own organization. Admitting that the Coast Guard had borne the primary responsibility for sea rescue off the coast of the United States since 1915, the AAF contended that no purely continental organization could operate a service that had to extend from the "Ice Cap of Greenland to the Jungle of Burma."[2]

Perhaps with an eye to a future when U.S. overseas air forces would be withdrawn, the ATC did not join in the otherwise AAF-wide desire to have all air-sea rescue responsibility under AAF control. On 28 March 1945 Maj. Gen. Harold L. George wrote Lt. Gen. Barney M. Giles expressing concern over the provisions of AAF Regulation 20-54 charging ATC with rescue responsibility on transport routes. General George felt that ATC was "in no way equipped to carry out this responsibility," and stated "that the only way to provide the maximum efficient sea rescue service is by turning over that responsibility to the Navy." The George letter concluded:[3]

> . . . the Army Air Forces is not, and in my opinion cannot logically be, prepared to fulfill the heavy responsibility that rests upon it in safeguarding the over ocean airlanes of the world in a manner that will insure that all individuals making trans-ocean flights are provided with the maximum security and safety in the event that water landings become necessary.

The end of the war in Japan only accentuated the question of rescue responsibility. Naval authorities continued to press the primacy of the Coast Guard's claim and at the same time was deactivating its own rescue squadrons. AAF spokesmen remained reluctant to change their position through fear that AAF rescue needs would not be adequately met

if an agency outside its own jurisdiction controlled all rescue activities. As late as November 1945, however, the AIC was unwilling to accept responsibility for operating the rescue organization.[4] No decision was reached until after a memorandum that same month by Lt. Gen. Hoyt S. Vandenberg, Assistant Chief of Air Staff for Operations, who discussed the problem and proposed a solution.[5]

General Vandenberg stated that the lack of a rescue organization in 1941 had led to the introduction of varying systems influenced by local conditions in the different theaters. Conflicting policies were the result. Attempts to establish joint policies or a joint organization had been unsuccessful, largely because of Navy opposition. These rescue organizations faced the problem of providing four types of cover: for operational strikes, transport routes, rear areas, and individual bases. The AAF had provided superior cover for strikes, but the cover for the second and third types had been neither efficient nor economical, and rescue in the fourth category had been largely improvised by each base.

General Vandenberg believed that six elements were needed for air-sea rescue: control and supervision; communications facilities; mobile, self-contained airborne rescue units; base rescue equipment; ocean-going station vessels; and destroyers and submarines. He asserted that the first four of these could be provided by the AAF, but the last two could not.* The Navy, however, was deactivating its rescue squadrons and

*General Vandenberg dismissed the use of rescue boats by the RAF and AAF as being "only successful" in the English Channel and even there only in the early stages of the war. This perhaps overlooked the number of rescues accomplished by boat crews in the Southwest Pacific. However, for long-range patrols the rescue boats were inadequate, and his evaluation of their use was undoubtedly based on this fact, plus the obvious superiority of the rescue cover afforded by Navy ships.

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would depend on regular patrol squadrons and the Coast Guard for postwar needs. Other factors to be considered were the Civil Air Patrol's intention of formulating a rescue plan for the Zone of Interior, and the results of tests and operational experience with the helicopter. In view of CAP's project, it was doubtful that the AAF should maintain an elaborate rescue organization in the United States. The helicopter experiments indicated the possibility of developing that aircraft as an all-purpose rescue instrument which would replace crash boats, miscellaneous ground equipment, and other aircraft.[6]

In summarizing, Vandenberg stated that:[7]

1. A joint Army-Navy rescue organization was not possible.

2. AAF coverage in combat areas was excellent, but duplication and inefficiency existed in rear areas.

3. AAF operation of rescue control, distress-communication facilities, and airborne rescue units had been superior, but the rescue program as a whole had not been a success.

4. The Coast Guard was planning a comprehensive sea-rescue program for transoceanic air routes and waters near the United States and its possessions.

Finally, he recommended approval of a directive which would delegate the responsibility for providing an aircraft search and rescue service for all components of the U.S. Army to the AAC. The AAC would be directed to establish and maintain a land-air search and rescue organization within the United States and sea-search and rescue agencies along AAC foreign routes, organize mobile rescue squadrons for assignment to each theater air command, and establish liaison with Coast Guard commanders for continental search and rescue.[8]

[redacted]

Acceptance of General Vandenberg's conclusions set the framework within which the AAF formed its postwar rescue organization. In accordance with his assessment of the value of sea craft, it was decided that AAF rescue units would use only aircraft in their operations. All AAF rescue craft longer than 45 feet were declared excess. The smaller craft, however, were retained for rescue operations in waters near airfields; it was expected that the Coast Guard would assume future responsibility for rescue-boat operations in the open sea.[9]

Organization. The ATC did not attempt to establish a world-wide rescue service immediately. Its first activities were confined to the United States, and control was extended only gradually to overseas regions.

The first move toward establishing a rescue service under ATC was the organization of the 62d AAF Base Unit, with headquarters at Andrews Field, Maryland, effective 23 January 1946. Personnel were drawn from the continental air forces' search and rescue base units, which the new organization was to replace in maintaining rescue coverage for the Zone of Interior.[10] Two months later, on 13 March 1946, its designation became Headquarters, Air Rescue Service (62d AAF Base Unit).[11]

To afford nation-wide rescue service, three sector control centers were designated. These were located at Andrews Field, Maryland; Peterson Field, Colorado Springs, Colorado; and Hamilton Field, California. Twelve detachments aided in extending rescue service: five were assigned to the Maryland control center (A), four to Colorado Springs (B), and three to the California center (C). Personnel for the detachments and control centers were drawn chiefly from the First, Second, Third, and Fourth Air Force search and rescue base units.[12]

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This arrangement lasted for less than a month, and in April sector control centers B and C were consolidated, with headquarters at Hamilton Field. Unit assignments were also changed. The only change in the east was the shifting of the detachment at Westover Field, Massachusetts, to Mitchell Field, New York. Units at Andrews, MacDill, Selfridge, and Memphis retained their original assignments. In the west, under sector control center B, the use of Peterson Field and Biggs Field, El Paso, Texas, as bases for rescue units was discontinued. Kirtland Field, Albuquerque, New Mexico, replaced Biggs as a center for rescue operations in the southwest, and units at Hill Field, Ogden, Utah; Great Falls, Montana; Portland, Oregon; March and Hamilton Fields, California, remained in their original positions.[13]

Shortly after these changes were made, Headquarters, Air Rescue Service (ARS) itself moved from Andrews Field, Maryland, to Washington National Airport on 29 May 1946, and from there to Morrison Field, West Palm Beach, Florida, on 1 July. This last shift was made to bring the headquarters closer to the 5th Emergency Rescue Squadron, which had been transferred in May from Keesler Field, Mississippi, to Morrison Field, and assigned to ARS for the purpose of conducting rescue training.[14]

The movement of Headquarters, Air Rescue Service to Morrison Field was followed by another rearrangement of unit assignments. Control centers A and B were redesignated as headquarters squadrons A and B, with no change of station. Westover Field, Massachusetts, and Fort Worth, Texas, became ARS bases, while Mitchell, Peterson, and Biggs Fields were dropped from the list. On 26 July 1946 headquarters squadrons A and B

were redesignated as air rescue squadrons. At the same time all subordinate units were designated as numbered air rescue detachments. The 5th Emergency Rescue Squadron was redesignated as the 5th Rescue Squadron on 11 April 1947.[15]

In the late spring of 1947 the designations and stations of all Air Rescue Service organizations were as follows:[16]

Headquarters, Air Rescue Service (62d AAF Base Unit)
Morrison Field, West Palm Beach, Florida

5th Rescue Squadron, Morrison Field, Florida

Air Rescue Squadron A (62d AAF BU)
Pope Field, Fort Bragg, North Carolina

Air Rescue Detachment #2 (62d AAF BU)
Westover Field, Massachusetts

Air Rescue Detachment #4 (62d AAF BU)
Selfridge Field, Michigan

Air Rescue Detachment #5 (62d AAF BU)
Scott Field, Illinois

Air Rescue Detachment #6 (62d AAF BU)
Biggs Field, Texas

Air Rescue Squadron B (62d AAF BU)
Hamilton Field, California

Air Rescue Detachment #8 (62d AAF BU)
McChord Field, Washington

Air Rescue Detachment #9 (62d AAF BU)
March Field, California

Air Rescue Detachment #10 (62d AAF BU)
Hill Field, Utah

Air Rescue Detachment #11 (62d AAF BU)
Great Falls AAB, Montana

Air Rescue Detachment #12 (62d AAF BU)
Lowry Field, Colorado

These myriad changes were typical of the air rescue establishment in the postwar period. Relocation and redesignation of units occurred at periodic intervals. Some of the changes were in the interest of greater efficiency of operation, while others were due to inactivation of bases in a period of postwar austerity.

Throughout this period ARS personnel did not lose sight of their future global mission. In January 1947 Col. Richard T. Kight, ARS commander, directed that a plan be prepared for a world-wide organization.[17] Headquarters, Air Rescue Service was returned to Washington in December 1947 so that coordination with other AAF services could be achieved and planning facilitated. Training functions, however, continued to be carried on in Florida by the 5th Rescue Squadron, which was also responsible for rescue coverage of that area.[18]

Early in 1948 the awaited projection of ARS control into overseas areas began. Rescue organizations in Saudi Arabia, Tripoli, the Azores, Bermuda, Newfoundland, and Labrador were established.[19] In most instances these were small units with a minimum of rescue equipment. The Saudi Arabian detachment at Dhahran, for instance, had only three officers, two enlisted men, and one B-17 when activated as the 512th Base Unit.[20] At Wheelus Field, Tripoli, the 2154th Rescue Unit had some 30 officers and enlisted men and two B-17's at the end of its fifth month of existence.[21] The 2152d Rescue Unit was equipped with 2 B-17's, 10 OA-10's, and 1 L-4, but these were scattered between flights located at Newfoundland, Labrador, Bermuda, and the Azores.[22]

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Meanwhile, the rescue organizations in the United States were again renamed in February 1948. The old squadron and detachment designations were dropped (except for the 5th Rescue Squadron), and all personnel were assigned to the 8th and 9th Rescue Units, which, with their flights, were made responsible for all rescue missions in their country. Headquarters and Headquarters Squadron, Air Rescue Service was moved to Gravelly Point, Virginia, and its flight section to Pope Air Force Base, Fort Bragg, North Carolina. The 8th Rescue Unit had flights based at Hamilton and March Fields in California, and McChord Air Force Base in Washington. Lowry Air Force Base, Denver, Colorado, was the center for 9th Rescue Unit activities, with flights based at Biggs Field, Texas, and Selfridge Field, Michigan.[23]

Assignment of Air Rescue Service to the Military Air Transport Service (MATS), established on 1 June 1948, brought more changes and additions. The 1050th Rescue Unit was established with headquarters in Newfoundland and flights in Labrador, the Azores, and Bermuda. The 1061st was activated in Tripoli, and the rescue detachment at Dhahran became the 1060th Rescue unit.[24]

These numerical designations were altered in August. The 1050th, at Newfoundland, became the 2152d; the 1060th, at Dhahran, became the 2153d; and the 1061st, in Tripoli, became the 2154th. In the United States the 2150th and 2151st Rescue Units replaced the 8th and 9th Rescue Units.[25]

In the meantime the 5th Rescue Squadron continued its training duties and rescue operations from MacDill Air Force Base in Florida, although one flight was located at Westover AFB, and one at Pope AFB to afford rescue coverage in those areas.

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In 1949, the Air Rescue Service extended its authority into Europe and the Pacific with the assignment of the 2d, 3d, 4th, and 7th Rescue Squadrons to its jurisdiction. These assignments, however, did not alter the operational control of overseas units. That authority continued to be vested in the air commander of the theater, area, or base concerned. On 1 September an extensive reorganization of all rescue units was ordered; the result was the creation of numbered squadrons at the bases indicated below:[26]

1st Rescue Squadron

Headquarters and	Flight A	MacDill AFB, Florida
	Flight B	Albrook AFB, Canal Zone
	Flight C	Ramey AFB, Puerto Rico
	Flight D	Kindley AFB, Bermuda

2d Rescue Squadron

Headquarters and	Flight A	Kadena Field, Okinawa
	Flight B	Kadena Field, Okinawa
	Flight C	Clark AFB, Philippine Islands
	Flight D	North AFB, Guam, Mariana Islands

3d Rescue Squadron

Headquarters and	Flight A	Yokota AB, Japan
	Flight B	Yokota AB, Japan
	Flight C	Misawa AB, Japan
	Flight D	Ashiya AB, Japan

4th Rescue Squadron

Headquarters and	Flight A	Hamilton AFB, California
	Flight B	March AFB, California
	Flight C	McChord AFB, Washington
	Flight D	Hickam AFB, Hawaiian Islands

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5th Rescue Squadron

Headquarters and	Flight A	Lowry AFB, Colorado
	Flight B	Biggs AFB, Texas
	Flight C	Maxwell AFB, Alabama
	Flight D	Selfridge AFB, Michigan

6th Rescue Squadron

Headquarters and	Flight A	Westover AFB, Massachusetts
	Flight B	Ernest Harmon AFB, Newfoundland
	Flight C	Goose AB, Labrador
	Flight D	Bluie West I, Greenland

7th Rescue Squadron

Headquarters and	Flight A	Wiesbaden AB, Germany
	Flight B	Lajes Field, Azores
	Flight C	Wheelus Field, Tripoli, Libya
	Flight D	Dhahran Field, Saudi Arabia

From 1949 to 1952 additions to the above roster of air rescue squadrons included the 9th and 10th Rescue Squadrons and the 2156th Air Rescue Unit (ITU). Headquarters of the 9th and three of its flights were based in England, and one flight was at Wiesbaden, Germany. The latter flight replaced the 7th Rescue Squadron, which moved its headquarters to Tripoli. The 10th Rescue Squadron was stationed in Alaska, and the 2156th carried out rescue-training functions at MacDill Air Force Base.[27]

Training. The 2156th Air Rescue Unit, activated on 21 January 1950, carried on the training of rescue personnel which had previously been assigned to the 5th Rescue Squadron. Training conducted by this unit

included instructions of aircrews for operation of the SB-29 and SA-16 planes and the H-19 and H-21 helicopters. Separate programs were established for each aircraft, and included ground school, transition flight training, and operational rescue aircrew training. In addition, there were courses of instruction for all in such subjects as land rescue, precision spot-parachuting techniques, evacuation of injured or distressed personnel, administration of first aid, survival (arctic, desert, and jungle), special vehicles operation, land navigation, native psychology, mountain climbing, advanced swimming techniques, communications, aerial delivery of equipment and supplies, and medical procedures. In other words, the school provided specialized training for every phase of rescue work.[28]

Operations. Rescue missions naturally diminished in number after World War II, but increased again as the Air Rescue Service area of operations widened. In the last 6 months of 1946 only 107 searches were conducted,[29] but in the corresponding months of 1947 the number had increased to 435.[30] Search missions in the last half of 1948 totaled only 247, although there were 1,215 occasions on which rescue personnel were alerted.[31] With the assignment of additional overseas rescue squadrons in 1949, the number of alerts increased to a year's total of 3,155, of which 2,089 were false and 1,066 necessitated search and rescue activity.[32]

Problems. False alerts, caused by the failure of pilots to make prompt and proper notification of late arrivals, completion of flights, changes in flight plans, and the like, were a constant strain on the operational efficiency of the Air Rescue Service. Reports from individual

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units continually stressed the number of false alerts, and the totals are appalling to contemplate. In the last half of 1947, out of 787 total alerts, 352--nearly half--were false.[33] Since the total alert figure included civilian as well as military planes, it might be expected that the former were largely responsible. On the contrary, however, the figures for that period indicate that military personnel were culpable to a far greater extent. Of 258 alerts occasioned by civilian aircraft, only 52 were false, but over one-half (300) of the total of 529 military alerts were false.[34] As late as 1949 almost two-thirds of all alerts received were unjustified.[35]

Personnel shortages, lack of funds, and makeshift and antiquated aircraft and equipment were other major problems of the Air Rescue Service in the postwar years. There was no critical shortage of officers, but the lack of trained enlisted men was a constant source of difficulty. As early as December 1946 the number of available enlisted men was only a little more than half the authorized figure.[36] By 1949 the situation had eased, but shortages of airmen in certain categories were still apparent, and sufficient helicopter and amphibian pilots and navigators were not available.[37]

Shortage of funds was particularly apparent early in the postwar period. Communications were for a time seriously affected thereby. During the war, when money was plentiful, an excellent communications network had been established by the numbered air forces in the Zone of Interior. Complete coordination with all interested agencies had been achieved, and intercommunicative systems involving boats, aircraft, search parties, and air bases had been well developed. In the short time between

the end of the war and the formation of the Air Rescue Service these facilities had deteriorated because of budget-cutting and shortage of trained personnel to the point of inefficiency. By 1947, however, the Air Rescue Service had succeeded in reestablishing an efficient communications net within the Zone of Interior.[38]

Parts shortages and maintenance problems affected some rescue units, particularly those located overseas. The story from these outfits is consistently similar. Flights L and C of the 2152d Rescue Unit, based in Labrador and the Azores respectively, reported in 1948 that their greatest problem was obtaining aircraft parts. Flight C, with only one operational aircraft, feared its loss at any time because of maintenance difficulties.[39] The unit in Tripoli reported that throughout July 1948 it had only one B-17, and that was out of commission most of the month.[40]

The 2153d Rescue Unit at Dhahran had a unique complaint. On 23 September 1949 they were alerted to have a full crew standing by at all times, prepared to go to the assistance of Lowell Thomas, the author and news commentator, who had been thrown from a horse in faraway Tibet and injured. The order was complied with, but the unit felt that the alert was unreasonably prolonged when further orders had not arrived after the expiration of seven days.[41]

Despite lack of satisfactory equipment, maintenance difficulties, and other problems, the ARS mission continued to be carried out in an outstanding manner. When on 16 November 1949 a B-29 en route from March Field, California, to Bermuda was forced to ditch, two SB-17 rescue aircraft from Kindley Air Force Base in Bermuda were already in the air

attempting to intercept the plane and lead it to its destination. Although prompt action had been taken, a large-scale four-day search, involving approximately 150 planes, was necessary before the survivors were located and the rescue performed by an SB-17, which first dropped its lifeboat and then guided a Canadian cutter to the spot.[42]

Much credit for the successful peacetime record of the rescue crews must be given to their ability to cooperate with other military units--those of both the United States and other countries. The AAF rescue detachment in the Azores, for example, combined forces with the Portuguese rescue squadron in training missions which paid handsome dividends when an actual emergency arose.[43]

Chapter IX

AIR-SEA RESCUE IN KOREA

When hostilities began in Korea, the Air Rescue Service was represented in Japan by the 3d Air Rescue Squadron, whose flights had been based on Japanese airfields since the end of World War II. Aircraft from that squadron were almost immediately drawn into the conflict.

Rescue Organization and Equipment

Within the Far East Command, Headquarters, Far East Air Forces (FEAF) was charged with the responsibility of coordinating Army, Navy, and Air Force search and rescue activities. Responsibility for search and rescue in the Japanese area, including Korea, was delegated by FEAF to Fifth Air Force. The 3d Air Rescue Squadron was designated as the operating agency within this area.[1]

The original personnel authorization of the 3d Air Rescue Squadron was 108 officers and 353 airmen.[2] They were assigned to four flights--A, B, C, and D--which at the outbreak of the war were stationed respectively at Johnson, Yokota, Misawa, and Ashiya bases in Japan. In addition, a detachment of Flight D was at Seoul, Korea.[3] Rescue equipment included H-5 helicopters, SB-17's (with airborne lifeboats), C-47's, and L-5's. The 3d Squadron had no SB-29's or SA-16's until after the beginning of hostilities in Korea.[4]

The first crucial problem facing the Air Rescue Service was the shortage of personnel. A new T/O & E (7-1613) raising the personnel

level to 122 officers and 624 airmen was authorized on 10 August 1950.[5] Before that time, however, emergency aid was extended by assigning personnel on TDY from the 2d Air Rescue Squadron, based at Okinawa. As additional personnel were assigned from the Zone of Interior, those on TDY returned to their original squadron.[6] In this manner the actual strength of the 3d Squadron was built up from 88 officers and 381 airmen on 25 June 1950 to 133 officers and 623 airmen on 15 November 1950.[7]

Further aid resulted from the activation of Detachment E of the 5th Air Rescue Squadron, Lowry Field, Colorado. This unit, composed of 4 SA-16 planes, 12 officers and 22 airmen, arrived in Japan on 28 July 1950. The original TDY of 120 days was extended to 150 before permanently assigned SA-16's and crews replaced them.[8]

A second problem was the lack of suitable aircraft. The first four SA-16's to arrive in Japan were those of 5th Squadron's Detachment E, and the first planes of this type assigned to 3d Squadron did not arrive until 20 November. The first SB-29 was assigned four months earlier, on 29 July 1950. By the end of 1950 the 3d Squadron was equipped with 14 H-5 helicopters, 8 SA-16's, 6 SD-17's, 5 SB-29's, 3 C-47's, and 3 L-5's.[9]

Aircraft maintenance and rescue communications provided additional worries for rescue personnel. The increased allotment of aircraft equipment and the task of working on unfamiliar plane types placed a burden on mechanics and supply lines which they were at first unable to cope with efficiently. However, as priority was given to Korea-bound supplies, and mechanics began to become familiar with the SA-16 and the SB-29 aircraft, out-of-commission hours declined. By December 1950 aircraft maintenance was as efficient as in peacetime. The SA-16 was

the greatest source of difficulty. A maintenance kit was included with the planes of 5th Squadron's Detachment E, but it was not adequate to keep them in flying condition at all times. On one occasion all four SA-16's were grounded at once while awaiting parts.[10]

Rescue communications controlled by the 3d Squadron eventually became highly efficient, but at first the shortage of equipment and trained personnel caused delays in transmission. Again the chief need was for rapid expansion of facilities. Rescue units resorted to telephones as other means of communication became well-nigh useless under the strain placed upon them. In some cases electrical messages were delayed from two to three days and arrived long after the mission to which they referred was to have been accomplished. The assignment of supply priorities, however, succeeded in reducing the delay to no more than 8 to 10 minutes.[11]

Operations

Organization. Coordination of rescue efforts and liaison with other combat units was effected by an air rescue officer appointed to the Directorate of Operational Services, FLAF. It was this officer's duty to advise the Director of Operations on the operational status and capability of air rescue units, to form policies and programs for search and rescue, to prepare and supervise plans and procedure for rescue missions, to make recommendations on the assignment and location of aircraft, and to monitor rescue missions.[12] Rescue coordination centers were established at air defense control centers at Johnson, Fukuoka, and Misawa airfields, and a naval liaison officer was assigned to each control

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center to insure coordination with naval rescue operations. For direction of search and rescue operations in Korea, a rescue coordination officer was appointed to work in close conjunction with the Joint Operations Center (JOC).[13]

The 3d Air Rescue Squadron operated a 24-hour-a-day radio network, centered at Johnson Air Force Base, which covered all of Japan and Korea for direction and coordination of rescue activities. The rescue network could contact practically every American or Japanese agency which could be utilized in rescue activities. In emergency cases air rescue stations at Iwo Jima, Guam, Manila, Okinawa, and Hawaii could be called on for assistance.[14]

A distressed aircraft was to notify its home base, which checked with the nearest control center. The rescue network then began operation, providing a clear channel for rescue directions. Air rescue units nearest the scene were assigned the mission unless they lacked the specialized equipment needed for a particular situation.[15]

Rescue procedures were similar to those used in World War II. Cover was regularly provided for in mission planning, and facilities made available for special search and rescue flights when needed.

Medical evacuation. A new field of rescue activity--evacuation of wounded by aircraft--was inaugurated in Korea because of the difficulty in moving front-line casualties over the rough Korean roads to rear-area hospitals. The helicopter was seized upon as the ideal instrument for speedy evacuation of the wounded, and the few which 3d Squadron had on hand in June 1950 were in almost constant demand from the early days of the war.[16] When Colonel Kight, Air Rescue Service commander, visited

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Japan in the summer of 1950, he found AFS helicopters being used exclusively for evacuation. Although medical air evacuation had not previously been a part of the AFS mission, and the use of all available helicopters for that task made difficult the successful performance of rescue duties, it was a function that logically belonged to the Air Force, and Colonel Kight recommended the formation of helicopter units for this purpose.[17] His recommendation was still being studied by the Air Staff on 22 November 1950, but in the meantime a helicopter evacuation unit, Detachment F of the 3d Air Rescue Squadron, had been activated on 24 September 1950 at Taegu, Korea.[18]

Detachment F, later designated Detachment One, was composed of 11 officers and 56 airmen, and originally equipped exclusively with H-5 helicopters.[19] By October 1950 the detachment was also flying L-5 aircraft, which were found adequate for some evacuation missions.[20] In 1951 two H-19 helicopters, larger versions of the H-5's, were assigned to the 3d Air Rescue Squadron.[21] Four more H-19's were sent to Korea in February 1952.[22]

Carrying two patients and a medical technician on each flight, a helicopter could compress an hour of land travel to a five-minute air hop.[23] A medical officer of a Korean field hospital, examining one group of six wounded soldiers who had been evacuated by helicopter, stated that five would have died had they been moved by normal land means.[24] In June 1951 Dr. Elmer L. Henderson, chairman of the American Medical Association, stated that the mortality rate among wounded soldiers in Korea was only 2 per 100 in Korea as compared with 4 per 100 in World

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War II. One of the major reasons was "speedy air evacuation."[25] Third Squadron helicopters had evacuated 32 front-line patients by 6 August 1950, and at the end of the first half-year of the war the number of helicopter medical evacuees had reached 618. During the same period L-5 aircraft evacuated 56 wounded soldiers.[26]

Most helicopter and L-5 missions were between front-line medical clearing stations and rear-area hospitals. If the wounded soldier required immediate medical attention of a type available only at hospitals in Japan, the aircraft landed at an airstrip from which a transport plane flew him to Japan.[27] Medical attendants aboard the evacuation aircraft were often called on to give immediate first aid to wounded men. An outstanding example was the administration of an emergency plasma transfusion during a helicopter flight on 12 October 1950. The patient was an English pilot who had crash-landed behind the enemy lines.[28]

In December 1951 two helicopters of Detachment One were selected for a special mission to determine the practicability of direct helicopter evacuation to a hospital ship equipped with a helicopter landing platform. On the first two days of the test, the two pilots landed six times with simulated operational loads to acquaint themselves with the technique of shipboard landings. Wind was found to be the most important factor to consider; the ship's roll, caused by swells, was second; and pitch was third. It was decided that ideally the ship should face directly into the swell, eliminating the roll, with the wind from either forward quarter. The pilots radioed the hospital ship 5 minutes before landing to alert the ship crew, and made a normal approach with a traffic circle at a 200-foot altitude. Deck handling crews were charged with fire

protection, crash boat stand-by, securing the helicopter, and removing the patient. To safeguard the wounded passengers, four kapok life jackets were placed around each one, arranged so that if a ditching was necessary the patient would float with head out of the water and feet slightly submerged.

The experiment lasted from 23 December 1951 through 11 January 1952. In that time 134 sorties occurred in which 218 patients were evacuated. Almost all possible conditions were encountered from calm sea and wind and warm temperature to rough seas, winds up to 25 knots, and below-zero temperatures. Landings were made on both wet and dry decks, and emergency night landings were accomplished.[29]

Other helicopter missions. While medical evacuation was the primary helicopter mission in Korea, the aircraft were also used for rescues from behind enemy lines and from the sea. Operating under fighter cover, they succeeded in rescuing personnel from over 100 miles behind enemy lines. An early example was the rescue of a Navy pilot who on 1 August 1950 crash-landed 10 miles southeast of Pyongyang. A Kimpo-based helicopter flew 125 miles in 3½ hours to accomplish the rescue under enemy fire.[30]

Large-scale evacuation from behind enemy lines was effected by helicopters and L-5's in October 1950 after a paratrooper drop north of Pyongyang. Four helicopters and two L-5's shuttled wounded from the drop area to an evacuation hospital. In the 2-day period of operations, 21-22 October, 47 cases were evacuated. Although enemy ground fire was constantly encountered, no aircraft or personnel casualties were listed.[31]

Rapid air-sea rescues were frequently recorded. On 23 August 1950 a fighter pilot was rescued from the sea eight minutes after he crashed while in flight from a Japanese air base.[32] Four days later a fighter pilot who bailed out of his plane near southern Honshu was rescued within 40 minutes.[33] In March 1952 a singular triple rescue was effected by one helicopter. The series of rescues was initiated by a Navy pilot who bailed out a mile offshore after his ship was hit over the target. The helicopter arrived within 20 minutes, but the pilot was entangled in his parachute shroud lines and could not get into his life raft. As a result, the water so chilled him that he could not get into the sling without assistance. The rescue crewman jumped into the icy water and succeeded in placing the now unconscious pilot in the sling. Although the victim's temperature was down to 92 degress when he reached the nearest ship, he was revived within a few hours. The crew member had been forced to take the Navy man's place in the water, but before the helicopter could get back to the scene, one of the planes circling overhead tried to drop him a life raft. The raft became fouled in the stabilizer and the pilot was forced to ditch on the beach, unhurt, but under enemy fire. He ran into the water, and he and the crewman were both picked up by the helicopter. After taking the second rescued pilot to a Navy ship, the helicopter was on its way again to assist a Navy pilot who had ditched his plane in Wonsan Harbor. This time, however, a destroyer effected the pickup.[34]

The helicopter's versatility was demonstrated more than once. In 1950 approximately 600 South Korean troops were saved from an enemy-

surrounded area on the east Korean coast north of Pohang. A helicopter notified landing ships further north, returned to the rescue scene, and guided the troops to the seagoing craft.[35] Helicopters were used during August 1951 to evacuate United Nations soldiers from front-line positions when they were isolated by floodwaters. Sixteen soldiers were rescued by helicopter from flooded areas on 8 August, but the largest operation, 3 days later, involved 94 soldiers of the Turkish Brigade. In 34 sorties helicopters evacuated 83 from an area completely surrounded by water. Before the last 11 men could be saved, the water level made landings impossible, but the helicopter hoist was used to complete the operation successfully.[36]

A final use for 3d Air Rescue Squadron helicopters was the transport of United Nations officials to and from the truce-negotiations sites at Kaesong and Panmunjon, North Korea.[37]

Problems of helicopter operations. Because of the novelty of its operations, the helicopter rescue and evacuation detachment in Korea faced unaccustomed problems in carrying out its mission. Officer personnel of Detachment One prepared a report in October 1951 which dwelt on the pitfalls encountered and the means of escaping them:[38]

1. Command obligations--Any rescue unit functions most effectively when close to the scene of offensive operations. This necessity was accentuated in the case of the helicopter detachment because of the range and speed limitations of its rescue craft. The natural corollary was that the detachment moved often with the ebb and flow of battle, and had difficulty in maintaining relations with support units. It was necessary for detachment personnel to check the unit assignment to

supporting organizations to insure that the unit did not remain the responsibility of an organization too distant to furnish effective assistance. Detachment One received a lesson in this respect in December 1950 when the 8th Fighter-Bomber Wing was called back to Japan, leaving the rescue unit with no support in Korea until it was moved and attached to the 6153d Air Base Squadron on 2 January 1951.

2. Maintenance--The helicopter detachment found the same difficulty in obtaining replacement parts which confronts any unit equipped with a distinctive type of aircraft. Other problems distinctive type of aircraft. Other problems distinctive to the region and the equipment included the cold weather, which was hard on engine starters; the dust, which caused excessive wear in helicopter jackscrews; and the deteriorating effect of rain on the main rotor blades.

3. Operations--

a. Flights into enemy territory. Assignment of helicopter pilots to rescue of personnel from enemy territory, the report concluded, should be restricted to approximately once weekly for each pilot. Otherwise the pilots experienced a dangerous degree of mental tension due to the risks involved in flying a slow, unarmed, and unarmored craft into an area of probable enemy fire, landing under fire, and flying out again.

b. Evacuation of wounded. The two most important factors in this operation were speediness and accurate location. Pre-established lines of communication between the helicopter detachment and the medical facility in the front lines were the first essentials for speedy evacuation. Errors in

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indicating the location of an incident, both in reporting to the helicopter detachment and in marking the landing spot, were too often responsible for loss of valuable time. The importance of giving the correct grid coordinates and properly marking the landing site had to be impressed on medical personnel in front-line positions.

Detachment One found that piloting a helicopter in combat required techniques not taught in an ordinary course of pilot instruction. There were two particular factors which required the attainment of special flying skills. First was the frequent necessity of operating the helicopter with a maximum load, or even an overload. These conditions were compensated for by carrying a minimum fuel load (60 gallons of gasoline or less), and by combining vertical lift with forward movement so that the helicopter took off in a nose-low attitude. Correct use of ballast was important in such a take-off to prevent a crash. Secondly, because of their rescue missions behind enemy lines and evacuation missions close to the line of battle, pilots were frequently exposed to small-arms fire or flak. The slow speed of the aircraft seemed to be an asset when under enemy attack, since the flak bursts were consistently ahead of the helicopter. Nevertheless, Detachment One pilots were instructed to alter course and altitude as rapidly as possible whenever enemy fire was met.[39]

Helicopter losses. The first helicopter loss in the Korean war came on 25 July 1950, exactly 30 days after the war began, when a helicopter was forced to land behind enemy lines. The pilot stayed too long over enemy territory trying to locate a downed fighter pilot. When

at last he turned toward friendly ground, he found that United Nations troops had pulled back during the day and he did not have enough fuel to reach the new position. A safe landing was made, but the plane had to be abandoned when an attempt to drop gasoline failed because of enemy fire. The pilot and medical attendant succeeded in making their way back to the UN line. Their aircraft was destroyed by UN planes to prevent its capture by the enemy.[40]

Since the helicopter was a unique item of aerial equipment, it was perhaps fitting that the first helicopter loss due to enemy action was an unusual incident. On 1 October 1950 an H-5 was returning to base following an unsuccessful search for a downed fighter pilot. The plane was at 300 feet, following a road which had been mined by the North Koreans. Nearing a railroad tunnel, the helicopter was knocked into a hill by the blast of a large antitank mine. The crew members escaped unharmed, and were later returned to friendly territory in a jeep.[41]

The first helicopter-crew loss as a result of enemy action was recorded on 13 September 1951. A helicopter escorted by four fighters was hit on a rescue mission behind the enemy lines. The pilot managed to return to the Allied lines, but before he could land, a blade went out of track, cutting off the tail cone. The plane fell end over end from 300 feet, killing the pilot and medical attendant instantly.[42]

Another helicopter was lost because of enemy action on 25 October 1951, but this time there were no casualties. The rescue craft had been dispatched to pick up a pilot who was down in enemy territory. Heavy

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ground fire met the helicopter when it arrived on the scene, and it was hit on its first pass. The second try was successful, but the oil tank had been hit and the oil pressure was falling rapidly. The pilot flew as far south as possible before a forced landing was necessary. The helicopter rolled on its side during the landing and could not be retrieved, but two other helicopters evacuated the crew and the rescued pilot on the following day.[43]

Other rescue aircraft. While the helicopter detachment in Korea was establishing enviable rescue and evacuation records the SA-16's, SB-17's and SB-29's assigned to other elements of the 3d Air Rescue Squadron were carrying their share of rescue responsibility. The larger rescue aircraft carried out conventional missions, providing rescue cover for bombing and strafing missions originating in Japan or South Korea, and aiding flyers down at sea. Methods tried and proven in World War II were used, some of which had been forgotten and rediscovered. Such, for instance, seems to have been the case with SB-17 rescue cover for B-29 missions. The rescue planes took off 30 minutes ahead of the faster bombers so that they would reach the rendezvous point at the same time. This was described in FEAF Intelligence Roundup as the development of an "ingenious method."[44] Rescue craft in India, Southwest Pacific, and Central Pacific had used the same technique in World War II.

The first SA-16 mission in the Korean war was the rescue of a pilot from the aircraft carrier Philippine Sea on 5 August 1950. Accompanied by fighter cover, the SA-16 located the ditched pilot deep in enemy waters. A heavy sea did not prevent the SA-16 from landing and,

after two unsuccessful attempts, getting a line to the pilot, who was pulled to safety aboard the rescue plane.[45]

On 15 August 1950 a speedy rescue was accomplished in the Sea of Japan. The 3d Squadron received word from a fighter base that one of its planes had suffered extensive damage and the pilot was about to bail out. An SA-16 in the area was contacted, reached the area in time to see the pilot jump, and picked him up in less than five minutes.[46]

The first airborne-lifeboat drop in the Korean war was made on 8 December 1950 by an SB-17 crew assigned to Flight D, 3d Air Rescue Squadron. The boat was dropped to the only survivor of a B-26 which had gone down on the night of 6 December while returning from a bombing mission in North Korea.[47]

Statistics

The variety of services offered by the 3d Air Rescue Squadron in the Korean area is enumerated in the accompanying table covering its first six months' operations. It is interesting to note that search and rescue operations accounted for only 22 of the total of 2,784 missions, while evacuation missions numbered 744. Only 12 air-sea rescues were accomplished (10 by SA-16's, 1 by an SB-17, and 1 by an H-5). This small number, however, indicates the relatively greater importance of overland operations and the effective surface cover afforded on the sea, rather than any deficiency in air-sea rescue operations. The importance of medical evacuation, the newest ARS mission, was the most noteworthy development in the early months of rescue operations in Korea.

3D AIR RESCUE SQUADRON
OPERATIONS IN THE KOREAN AREA
25 JUNE - 31 DECEMBER 1950

AIRCRAFT TYPE	MISSIONS										
	SEARCH	SEARCH & RESCUE	ESCORT	INTERCEPTION	RECONNAISSANCE	ORBIT	SUPPLY	EVACUATION	FALSE	OTHER	TOTAL
SB-17	244	1	22	16	8	193	26	10	1	269	790
L-5	35	2			3	1	26	70		65	202
H-5	69				2	8	139	635		186	1039
SB-29	6	2	10			32	12		2	46	110
C-47	9		2			2	188	21	1	86	309
SA-16	66	17	4	2	1	101	27	8		108	334
TOTAL	429	22	38	18	14	337	418	744	4	760	2784

AIRCRAFT TYPE	SB-17	L-5	H-5	SB-29	C-47	SA-16	TOTAL
NUMBER OF WATER LANDINGS OR BOAT DROPS	1		1			10	12
NUMBER OF MEDICAL EVACUEES	10	56	618		23	17	724
NUMBER OF PERSONNEL RETRIEVED FROM BEHIND ENEMY LINES		17	87				104
TOTAL PERSONNEL EVACUATED OR RETRIEVED	10	73	705		23	17	828

SOURCE HIST. ARS, JULY-DEC 1950, INCL., ARS DATA BOOK, 1950, P. 53.

The trends observed above continued into 1951 and 1952. In 1951 SE-17's and H-5's accounted for only 1 air-sea rescue each, and 59 SA-16 air-sea rescues were recorded.[48] To 30 June 1952 only four additional air-sea rescues, all by SA-16's, were accomplished. During the entire period from 25 June 1950 to 30 June 1952, the 3d Air Rescue Squadron evacuated 4,170 persons, rescued 894 from behind enemy lines, and accomplished 77 air sea rescues.[49]

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[illegible]

Original

Unclassified

[illegible]. Air-sea rescue operations in World War II achieved [illegible] rates of success in the different theaters of combat. Air-sea rescue in which Air Forces were involved [illegible] air-to-surface evacuation of rescued [illegible] by [illegible] dispersed units in all parts of the world, [illegible] 50 per cent of the cases. In the Pacific [illegible] of rescue [illegible] according to [illegible] accomplished. [illegible] efforts on [illegible] [illegible] to Japan [illegible] 40 per cent successful in [illegible], but in the [illegible] Pacific [illegible] were [illegible]. In other [illegible], the Caribbean, [illegible], and South Atlantic--[illegible] practicability of [illegible], but [illegible] [illegible] the end of the [illegible].

In general, three factors are responsible for the inadequacies in rescue activity in the early years of the war, and the failure to achieve satisfactory results in any [illegible]:

1. The inability of the [illegible]. Vessel [illegible] [illegible] and the inability of rescuing [illegible], [illegible], but the [illegible] to [illegible] the [illegible] [illegible].

2. [illegible]. With the [illegible], the [illegible] of the United States [illegible] [illegible], [illegible] ill-prepared [illegible] all-out [illegible].

3. [illegible] for building up [illegible] in all parts of the world--[illegible] with [illegible], aircraft, and [illegible] [illegible] [illegible] for [illegible] [illegible].

4. [illegible] [illegible]. In [illegible]

[illegible], British rescue organizations were launched and piloted [illegible] United States Army Air Forces personnel. Until the possibility for such a rescue with British facilities. Even after American air-sea rescue units were activated, they operated as adjuncts of the British rescue service. Great distances were also placed on the U. S. Navy. In the Central Pacific, for example, no air emergency rescue squadron was assigned until 1945.

Factors air and sea include for the increasing efficiency of rescue efforts were:

1. Improved planning. When rescue efforts turned from a ground-to-ground search, successful rehearsal of the mission was difficult. Improvements of rescue were directly tied to the degree of special training rescue crews, positioning of equipment, rescue control, and coordination. Such coordination was often lacking in the Mediterranean, for example, but when rescue operations specifically included in mission planning--as in the invasion of southern France--it materially increased the number above the general average. Much of the success enjoyed by rescue organizations in the Pacific theaters was the direct result of this observation.

2. Adequate equipment. Equipment designed specifically for rescue was slow in developing. Even in the last years of the war the equipment used was all set in the established category. Rescue personnel were being asked with equipment, mainly suited to their purpose, which because of its age, and, as such, its unsuitability to air force personnel, was difficult to maintain. Possible borrowing of parts was tried as an expedient characteristic of every air-sea rescue unit.

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[illegible], but [illegible] of equipment [illegible] training. In the rescue operations on the [illegible] route to Japan, [illegible] three types of aircraft--[illegible]'s, B-17's, and B-29's, were used, [illegible]. [illegible] rescue units were poorly [illegible] to [illegible] the record [illegible].

[illegible] equipment specifically [illegible] for rescue [illegible] accessible, [illegible]. For instance, when the first B-17's with lifeboats appeared in the [illegible], rescue [illegible] because of their [illegible]. [illegible] equipment [illegible]. [illegible] B-17 with lifeboats [illegible] also. Aircraft of this type delivered to the 1st Emergency Rescue Squadron in Italy never achieved [illegible] because the lifeboats never arrived.

3. Adequate personnel. [illegible] personnel were available in sufficient numbers to carry out [illegible] efficiently, other [illegible] themselves. [illegible] rescue units in the first years [illegible] by the absence of a T/O [illegible] designation, which [illegible] problems. [illegible], the [illegible] for rescue [illegible] often [illegible] with rescue [illegible] up. [illegible] units, [illegible] rescue [illegible] their [illegible] decision. The [illegible] of the [illegible] Emergency Rescue [illegible].

[redacted]

[illegible] Capri [illegible]

[illegible]

4\. [illegible]

[illegible] of their condition, to escape from the plane with [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] cor- [illegible] [illegible] [illegible] claim.

[illegible] air-[illegible] [illegible]

[illegible]

[illegible] under difficult conditions [illegible]

[illegible]

[illegible]. [illegible]

1. [illegible]

[redacted]

[illegible] maintenance [illegible] ---[illegible], [illegible], [illegible].

2. [illegible], [illegible] records, [illegible] clerks [illegible] [illegible].

3. [illegible] procedure should be [illegible] jointly [illegible] [illegible] in [illegible].

[illegible] July [illegible], [illegible] Commander-in-Chief [illegible] [illegible] "Joint [illegible]," [illegible] on 27 [illegible] which [illegible] [illegible] (Lt. Col. Glenn O. [illegible], *et al.*, [illegible] "Effective [illegible] [illegible] Command," [illegible], [illegible]-5). [illegible].

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An exhaustive study of the pertinent information in each depository was made. With the exception of material relating to specific technical subjects, such as rescue aircraft and equipment, the unit histories contain the most useful information. Attention is directed, however, to two works of great value for the particular aspects that they treat—Shepherd of the Seas, an historical study of air-sea rescue in the Eighth Air Force, prepared by the 65th Fighter Wing, and Air/Sea Rescue, a study of British rescue operations, issued by the British Air Ministry.

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