

AIR-SEA RESCUE

1941-1952

FOREWORD

This monograph examines the development of air-sea rescue in the Army Air Force through World War Two. 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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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 over-water flight. The air war in the Pacific presented a similar situation in exaggerated form. Accelerated training; in the Zone of Interior, over-water flights by tactical aircraft en route to the theaters of war, transportation of personnel and supplies by air, antisubmarine activity, convey 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 Weesche'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 crews, 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 irritated 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 PBV'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; 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 organization would result from adaptation 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 south-eastern 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. (see chapter VIII.)

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 over-water flight, Third Air Force was particularly concerned with 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 resulted from this lack of centralization 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 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 centers 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 Force 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 range 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 vessel's were stationed along the path of air travel. It was hoped that 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-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. Communication 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 (HM), very high frequency (VHM), and direction-finding frequency (D/F).
- 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 Commands 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 organization 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 bombing 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 train 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 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 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 to the aircraft. It was finally discovered that Canadian Vickers Limited, which manufactured the planes, had altered the original specifications by placing fever 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 13 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 procedures, 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 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 graduates, 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 finely 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

British Air-Sea Rescue

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 floatation equipment, but rescue was dependent on passing ships. In the 1920's British naval shipborne aircraft were equipped with some form of floatation gear, but the only RAF aircrews with 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 was 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 floatation 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 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 concerns 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 coordination 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 air-craft from their own units, and impromptu arrangements were made direct surface craft to the rescue point if

the downed airplane was located. Communication delays-the results 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 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 a better signaling 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 trail. 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 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 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 sea-worthiness 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, benefited 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 fluoresceine 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 percent, were saved; in the same period in 1942, there were 205 out of 568, or 36 percent.(20)

When the 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 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 officer, it was not adopted. Instead, air-sea rescue was assigned as an additional duty to the flight-control officer 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 expended continually; by autumn of 1943 there were 11 fixer stations in the U.S. network, and in 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 those 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 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 promises 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 hanger and very little equipment. Fortunately, the American soldier's traditional energy and determination to overcome obstacles prevailed-tools were borrowed, a hanger built, and other necessary facilities obtained.(30)

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 at 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, 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 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 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 ninth 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 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 all 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 over water 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 bearing 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 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 Lindholwe 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 planes 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 satisfactory manner in which these orders were handled, two 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 percent were saved, as compared with only 6 percent 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 permission planning, not called in only when in 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. Communication 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.

Chapter IV

THE 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 quipped 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 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 inexperienced 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 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 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 planes. 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. Flights 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 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 Bat 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)

Avery, 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, 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 historian for the 5th and 8th recorded no rescue activity, but the 11th and 12th participated in 11 rescue attempts during their

assignment to 1st Emergency Rescue Squadron. In addition, they cleared the water of debris, search for mines, towed seaplanes, ferried flight personnel, and guided seaplanes 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 Cammando.(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 S.O.S. 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 seaplanes 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 force 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 dispatch 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 over water 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 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 craft.

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-maker, 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 Mea 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 Mea 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 reained 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 aircrewmembers 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-months period were saved, and 38 per cent in the four months ending 31 December 1944. Actually no such sweeping conclusion is justified. No consolidation 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 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 taxing 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.