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PROJECT CHECO SOUTHEAST ASIA REPORT

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SEARCH AND RESCUE OPERATIONS IN SEA

1 JANUARY 1971 - 31 MARCH 1972

CONTINUING REPORT

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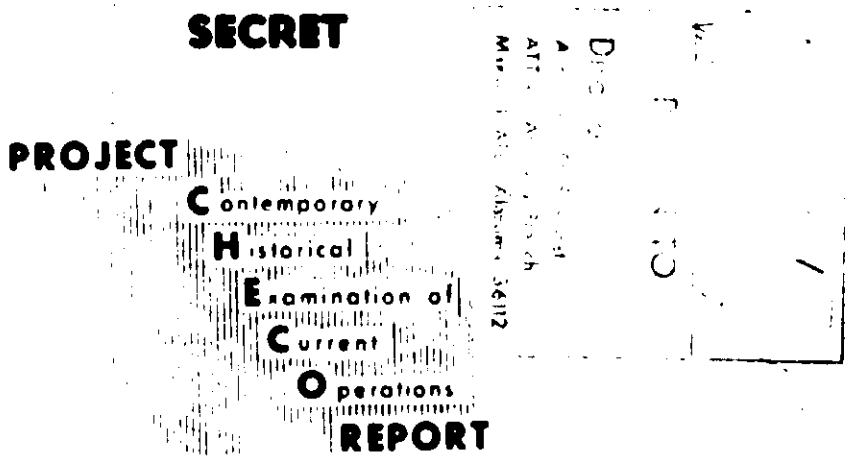

SEARCH AND RESCUE OPERATIONS IN SEA (U)
1 January 1971 - 31 March 1972

17 OCTOBER 1972

HQ PACAF

Directorate of Operations Analysis
CHECO/CORONA HARVEST DIVISION

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Project CHECO 7th AF, DOAC

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FOREWORD

This is the sixth report in a series by the Southeast Asia CHECO office on Search and Rescue operations. In preparing the fifth report--the period covering July 1969 through December 1970--the author of that study felt that it would possibly be the last on the subject during the war in Vietnam. For that reason, he elected to summarize all Search and Rescue activities in Southeast Asia to present what had transpired in that area through 1970. The reader seeking background information on Search and Rescue in Southeast Asia is, therefore, referred to the previous CHECO publications on the subject, primarily "USAF Search and Rescue in Southeast Asia--1 July 1969-31 December 1970," dated 23 April 1971.

This continuation report is directed toward covering those significant events which took place during 1971 and the first quarter of 1972. While the report was being prepared, great changes were taking place in concepts and tactics for Search and Rescue operations. Some of the changes were a direct result of the unilateral withdrawal of US forces from Southeast Asia, while others were simply a result of finding better ways of doing things.

It was true that when an aircraft was downed, practically all theater resources were made available for the rescue operation. However, the primary rescue-dedicated force was controlled by the 3rd Aerospace Rescue and Recovery Group. For that reason, the study places emphasis on the Group's operation, but the discussion will include,

when applicable, the support offered by outside resources. Throughout the research phase, the author met with unlimited cooperation by everyone contacted. The overall impression, hopefully conveyed in the report, is that there has never been a group of people more dedicated to a goal than those associated with Search and Rescue in Southeast Asia. Although bitter failures and tragedies were encountered during the period, there were also unprecedented successes. Through it all, the men flying combat in Southeast Asia could be assured that in the event they were downed, every conceivable effort would be made to get them back.

CHAPTER I

MISSION AND ORGANIZATION

The mission of the 3rd Aerospace Rescue and Recovery Group (3ARRGp) remained unchanged during the reporting period 1 January 1971 through 31 March 1972. The organization of the group, however, underwent significant changes, both through relocations and inactivations of some of its units.

MISSION

The 3ARRGp continued to provide a tactical force to rescue and recover personnel engaged in operations in Southeast Asia (SEA). The group planned, organized, coordinated, and controlled the execution of rescue operations. Command and control was provided through the Joint Rescue Coordination Center (JRCC), two Rescue Coordination Centers (RCC), and an Airborne Mission Commander (AMC).

The Commander, 3ARRGp, served on the 7th Air Force (7AF) staff as Director of Aerospace Rescue with the subordinate functions of: 1/

1. advising the Commander, 7AF, on matters pertaining to rescue and recovery requirements and procedures.

2. Coordinating on matters pertaining to all Aerospace Rescue and Recovery Service (ARRS) activities, requirements, and responsibilities in SEA.

3. exercising operational control of all rescue forces in SEA in accordance with policies established by the Commander, 7AF, and/or the Commander, 41st Aerospace Rescue and Recovery Wing (41ARRWg).

4. keeping the Commander, 41ARRWg, informed of Search and Rescue (SAR)/Recovery requirements and all planned or conducted SAR operations.

5. reporting directly to the Commander, 41ARRWg, on all command and administrative matters.

ORGANIZATION

The Military Airlift Command (MAC) was responsible for ARRS activities while the 41ARRWg at Hickam AFB, Hawaii, exercised administrative control over the Pacific region. The 3ARRGp, located at Tan Son Nhut Air Base (AB) in the Republic of Vietnam (RVN), was operationally responsible to 7AF, and executed the SAR mission throughout SEA. As of 1 April 1972, there were two squadrons serving under the 3ARRGp--the 37th Aerospace Rescue and Recovery Squadron (ARRSq) at Da Nang AB, RVN, and the 40ARRSq, located at Nakhon Phanom (NKP) Royal Thai Air Force Base (RTAFB), Thailand.

Two squadrons of the 3ARRGp were inactivated during the reporting period. The 38ARRSq at Tan Son Nhut was inactivated on 30 June 1971, and those Local Base Rescue (LBR) detachments (Det) that had been under the squadron became Dets of the Group. On the 31st of March 1972, the 39ARRSq at Cam Ranh Bay AB, RVN, was officially inactivated.

By that time, the unit (minus four aircraft and approximately 100 personnel) had joined Det 4 of the 3ARRGp and was performing its mission from Korat RTAFB, Thailand.[2/]

Further reductions in strength occurred with the continuing drawdown of USAF forces in RVN. With the cessation of flying activities at Phu Cat, Phan Rang, and Cam Ranh Bay Air Bases, the requirement for LBR operations at those locations no longer existed. Although there was a scale-down of USAF flying activity at Bien Hoa AB, RVN, continuous LBR support was provided that base by augmenting Det 14 at Tan Son Nhut and rotating aircraft on a temporary duty basis. In April 1972, the arrangement of the units of the 3ARRGp was as follows:[3/]

Unit	Location
JRCC	Tan Son Nhut AB, RVN
Operating Location (OL)-Alpha, RCC	Son Tra AB, RVN
OL-Bravo, RCC	Udorn RTAFB, Thailand
37ARRSq	Da Nang AB, RVN
40ARRSq	NKP RTAFB, Thailand
Det 3	Ubon RTAFB, Thailand
Det 4	Korat RTAFB, Thailand
Det 5	Udorn RTAFB, Thailand
Det 12	U-Tapao Royal Thai Naval Base (RTNB), Thailand
Det 14	Tan Son Nhut AB, RVN

(The above information is presented geographically in Figure I.)

Unit Assets and Responsibilities.

JRCC. Located with the 7AF Command and Control Center (7AFCCC), the JRCC (Joker) provided the command and control necessary in coordinating the complex SAR operation. When notified that an aircraft was down, Joker made the decision as to which RCC could best control the SAR effort. The decision was based primarily on the location of the downed aircraft since each RCC had its designated area of responsibility (see Figure 2). Based on communications considerations, Joker could elect to retain primary control of the mission. Also, in determining which of the rescue squadrons to use, Joker decided which was offered the best ingress and egress routes to effect the rescue. Whether it delegated or retained primary control, Joker insured that the following actions were taken:4/

1. The SAR forces were either alerted or launched.

2. The 7AFCCC (Blue Chip) Senior Duty Officer (SDO) was informed of the downed aircraft and what SAR action was being taken.

3. If one was not already there, a suitable Forward Air Controller (FAC) was directed to the SAR area as soon as possible.

4. Key personnel were notified and affected/interested agencies were advised.

The task of Joker than became one of coordinating a myriad of details with Blue Chip and other agencies. Intelligence information was examined, and if it was determined that MIG aircraft and/or Surface-to-Air Missiles (SAM) posed a threat to the SAR operation,

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3ARRGp ORGANIZATIONAL UNITS

As of 1 April 1972

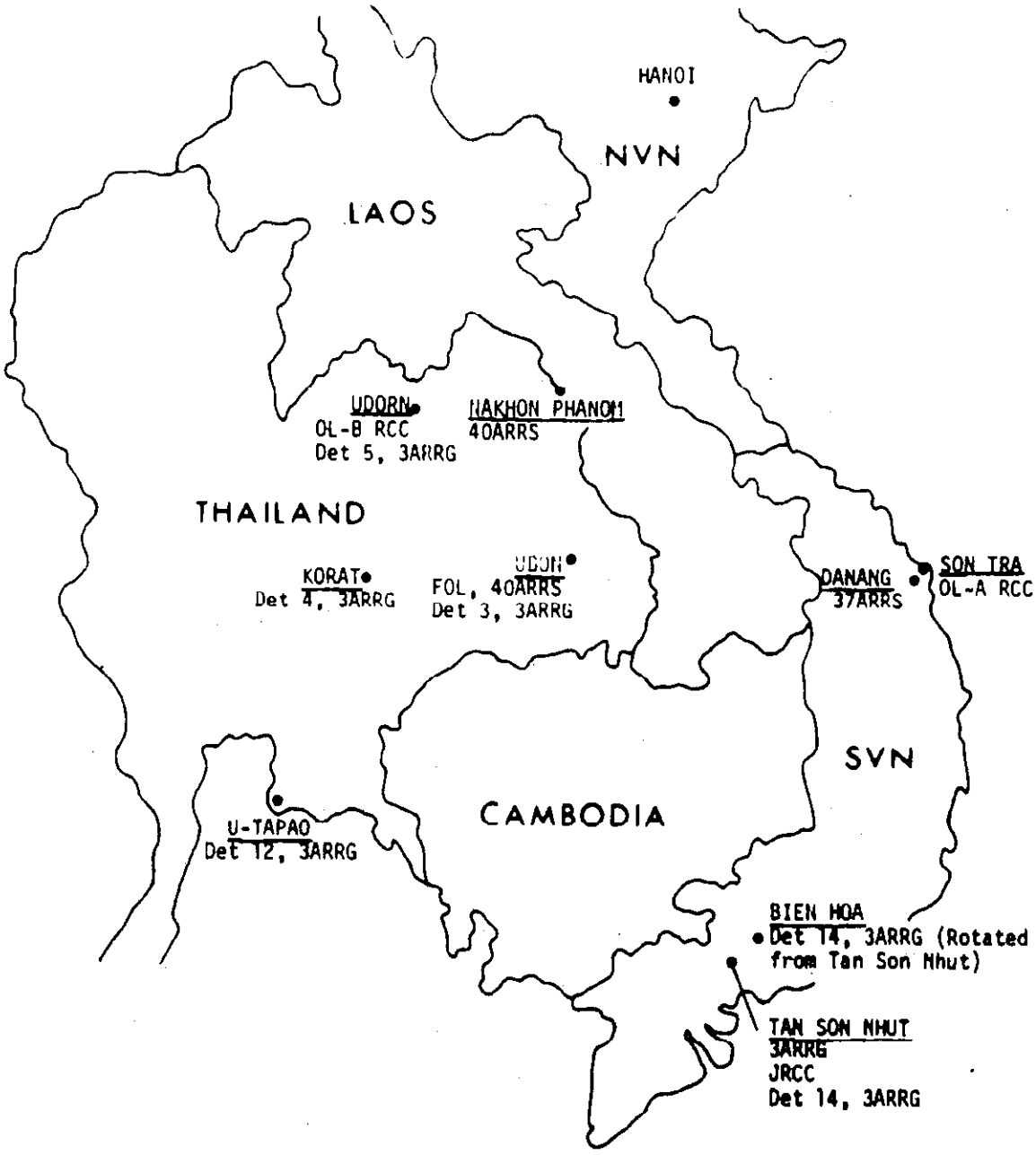
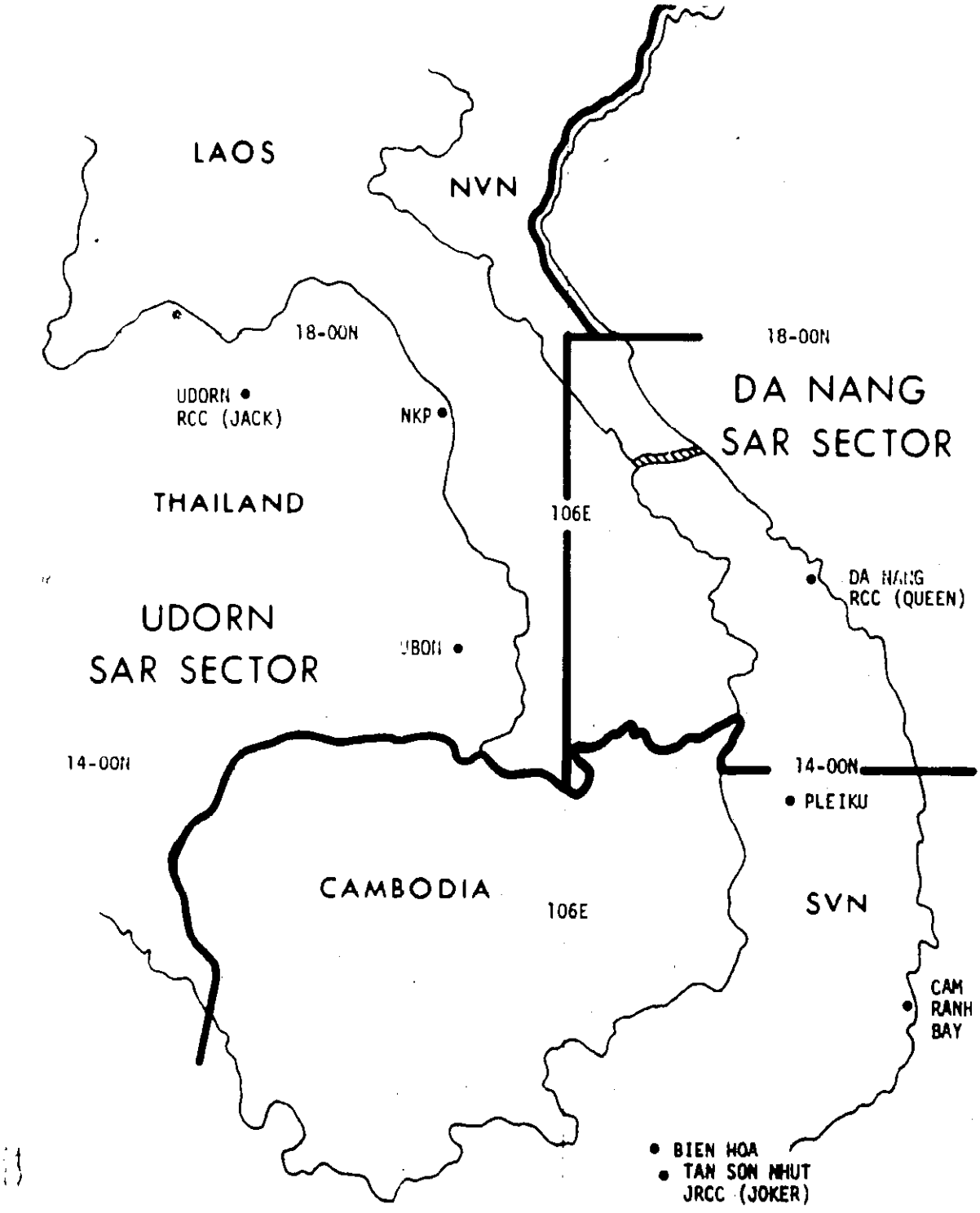


Figure 1 SOURCE: 3ARRGp



Designated SAR Sectors of

appropriate defenses were requested through Blue Chip. Additionally, Joker coordinated with Blue Chip to insure that requested strike aircraft were available with proper ordnance to complete the SAR effort. Finally, if the SAR operation was halted, and the decision made for a first light effort the next day, Joker was responsible for coordinating to secure adequate forces for the estimated duration of the operation.5/

Operating Location Alpha (OL-A). OL-A was the RCC responsible for SAR operations in the Da Nang Sector. The sector was defined as the land area bounded by 1800N, 10600E, 1400N (minus the northeast portion of Cambodia), and adjacent water within the Saigon Flight Information Region.6/

After delegating mission control to OL-A (Queen), Joker assumed a monitoring role. Queen was then responsible for coordination with the AMC and the SAR coordinator (SARCO), obtaining required forces and ordnance, and keeping Joker informed on the progress of the operation.

Operating Location Bravo (OL-B). The area of responsibility for OL-B (Jack) was the Udorn SAR Sector. This sector was defined as the land area for all of Thailand, all of Laos west of 10600E, and all of North Vietnam (NVN) west of five miles inland from the Gulf of Tonkin (GOT), and minus the southern portion assigned to the Da Nang SAR Sector. After assuming control of a SAR mission, the responsibilities of Jack were similar to those described for Queen.7/

37ARRSq. The 37ARRSq, equipped with HH-53 helicopters, was responsible for maintaining an alert posture at Da Nang AB and at specified orbit points when applicable. Until 5 December 1971, the 37th had also provided two aircraft on SAR alert at Bien Hoa AB. The closure of the Forward Operating Location (FOL) at Bien Hoa allowed for the reduction in Unit Equipped (UE) aircraft and the number of assigned HH-53 "Jolly Greens" stood at eight at the end of the reporting period.8/

In addition to the HH-53s, two HH-43 "Pedros" were assigned to the 37th for the LBR mission. The Pedro helicopters were primarily used in non-hostile environments and were limited (due to aircraft range) to operations within 75 miles of the base. However, when necessary and requested by the JRCC, these helicopters were available for combat rescue.9/

40ARRSq. The 40ARRSq was also equipped with Jolly Green and Pedro helicopters. The squadron moved from Udorn RTAFB to NKP RTAFB effective 21 July 1971. Prior to that, the 40th had maintained both a Det at NKP and an FOL at Ubon RTAFB for SAR alert. Following the move, alert was no longer pulled at Udorn while the FOL was retained at Ubon. Det 3 had been responsible for the LBR function at NKP but on 15 September 1971 the Pedros became part of the 40ARRSq.10/

Det 4. Through almost all of the reporting period the HC-130P "King" aircraft were stationed at Cam Ranh Bay and flew daily orbits in Laos. An additional HC-130P was positioned on alert at Udorn from first light to last light. Prior to the 31 March 1972 inactivation of the 39ARRSq (to which the HC-130s had been assigned), seven King aircraft were moved to Korat RTAFB to continue operations joining Det 4, 3 ARRGp. With the unit at Korat, there was no longer a need for the alert at Udorn and it was discontinued.

With the addition of the King aircraft, the mission of Det 4 was to provide an extended search capability, act as the AMC during SAR operations, and to serve as tankers for the Jolly Greens. The Pedros remained with Det 4 for the LBR mission.

LBR Dets. In addition to the HH-43 Pedros assigned to the 37ARRSq, the 40ARRSq, and Det 4, there were four detachments providing LBR for five other bases in SEA. Detachment 14 at Tan Son Nhut was expanded and performed the LBR mission at both Tan Son Nhut and Bien Hoa. The other detachments were Det 3 at Ubon, Det 5 at Udorn, and Det 12 at U-Tapao. The mission of the Pedros was to provide a fire fighting capability and to recover downed pilots in close proximity to their bases. As mentioned earlier, they were also on call, range permitting, for rescue operations in hostile areas.11/

In summary, the force posture of the 3ARRGp underwent significant modifications during 1971 and the first quarter of 1972. There were fewer ARRS aircraft operating from fewer locations as the redeployment of USAF forces continued. When asked what effect the redeployments and the realignment of 3ARRGp resources had on SAR flexibility, Colonel Frederick V. Sohle, Jr., Commander, 41ARRWg, replied:[12/]

> *Very little effect. There was some reduction in response to the west of the Plaines des Jars and to the north and northwest but [moving the 40ARRSq from Udorn to NKP was] much better for Steel Tiger [Southern Laos] where most of the action was.*
>
> *Moving the tactical fighter wings out of RVN during the redeployments resulted in LBR shutdowns, but Army and other helicopters made the majority of the pick-ups in-country. The air war is along the trail, unless we go north again.*
>
> *There has been little drawdown of SAR forces yet. When there is, the responsiveness will not be affected. Except for prolonged missions or multiple missions, SAR will continue as is.*

Colonel Sohle's reference to prolonged and multiple missions indicated a problem area that could be expected to become more severe in the future. The proliferation of enemy Antiaircraft Artillery (AAA) provided an increasing threat to air operations in SEA. When aircraft were downed, the job of recovering the survivors was becoming more hazardous and, in some cases, several days were required to render the SAR area permissive enough to enable the recovery to take place.

Another situation--one that would almost certainly call for a change in concepts and tactics--was the dwindling supply of Rescue Escort (RESCORT) aircraft dedicated to the SAR mission. Since its inception, the SAR Task Force (SARTF) in SEA had included the A-1 Skyraider. The "Sandys," while not in the 3ARRGp organization, were an integral part of the SAR tactics that had proved so successful. These problems and others will be discussed at length in Chapter IV, Operations.

CHAPTER II

AIRCRAFT AND SYSTEMS

AIRCRAFT

HH-53.

Throughout the January 1971-March 1972 period, the primary air rescue aircraft was the HH-53B/C (by the middle of 1971 the more powerful "C" model had replaced the remaining "Bs"). The aircraft was known as the BUFF which, although a less complimentary definition of the acronym was known to exist, stood for Big Ugly Friendly Fellow. More commonly used, however, was the familiar nickname and tactical callsign, Jolly Green.

The big helicopter carried a basic crew of five, consisting of the pilot and co-pilot, flight engineer, and two pararescue men (PJ). Features of the Jolly Green included: an Automatic Flight Control System (AFCS); a jungle penetrator on a 240 foot cable that was capable of hoisting 600 pounds; armor plating for crew and vital aircraft component protection; and three 7.62 mm mini-guns for use during operations in hostile environments. The HH-53's unrefueled radius of action was approximately 275 nautical miles (its air refueling capability provided an indefinite airborne time) and it was limited to the following airspeeds: forward flight at 170 knots; rearward flight at 30 knots; and sideward flight at 35 knots.13/

The HH-53 could lift heavy loads and carry up to 40 passengers and was, therefore, ideally suited for global ARS operations. It was also the best aircraft available for SAR operations in SEA but its size and the power required to operate it worked to its disadvantage in combat. When asked how adequate he thought the HH-53 was in performing the SAR mission, Colonel Sohle replied:14/

> *The HH-53 is good for heavy lift and fairly durable against small arms, but it is too big and produces too much downwash. We need an all-weather capability to locate and recover downed airmen. We need improved radar to fly low-level and we need a warning system for the missile threat. I think a small, fast, easily maneuvered helicopter with an inflight refueling capability would be best.*

HH-43.

The HH-43 Pedro had long been used for the LBR mission in SEA with the "F" model in use during the reporting period. Its performance envelope limited it to airspeeds of 105 knots for forward flight, and an estimated 20 knots for sideward and rearward flight. Its limited radius of action restricted its use as a combat rescue aircraft except in those cases where it could be employed near its base.15/

During Visual Flight Rules (VFR), day operation, only one pilot was required, while two were used at night and in Instrument Flight Rules (IFR) conditions. In addition to the pilot(s), there were two firefighters, one medical technician, and a crew chief. For SAR operations, the Pedro was equipped with a jungle penetrator on a 217 foot cable.16/

HC-130

The four-engined HC-130P King aircraft provided the communications link between the appropriate RCC (or the JRCC) and the SAR operation. King also provided the airborne mission control by coordinating requests for ordnance by controlling the flow of the various aircraft to the On-Scene Commander (OSC) for his use in neutralizing enemy defenses. To provide the communications capability, the HC-130 was equipped with High Frequency (HF), Very High Frequency (VHF), Ultra High Frequency (UHF), and Frequency Modulated (FM) radios.[17/]

The HC-130P also served as a tanker to refuel the Jolly Greens, thus providing the helicopters a theoretically unlimited operational capability. The crew of the King included two pilots, a navigator, a radio operator, two flight engineers, and a loadmaster.

RESCORT and FAC Aircraft

Other aircraft, though not assigned to the 3ARRGp, played an important role in SAR operations. One--the A-1 "Skyraider"--continued to be the best RESCORT aircraft available for providing the Jolly Greens with protection during SAR operations. Another aircraft--the OV-10 "Bronco"--had features that made it a very promising addition to the SARTF.

A-1

By the beginning of the reporting period, all USAF A-1 assets were consolidated at NKP under the 1st Special Operations Squadron (SOS) of the 56th Special Operations Wing (SOW). Although the 1SOS was responsible

for several different missions, a prescribed number of A-1s were made available daily for SAR support. As had been the case for years, "Sandy" was the tactical callsign for those SAR-dedicated A-1s.

The A-1 came in two basic models--the A-1E (or G) and the A1-H (or J). The primary difference was that the A-1E offered a side-by-side seating arrangement, while the A-1H was a single seater. Since the crew of an A-1 normally consisted of one pilot, the better visibility afforded by the single seat version made it the one preferred for combat, especially for the SAR mission.

The features of the A-1 that made it so ideally suited as a RESCORT aircraft included the following:[18/]

1. Its speed range was compatible with that of the Jolly Green, enabling it to easily escort the helicopter to the SAR area and, during the actual run-in to pick the survivor up, could provide continuous close cover during the ingress and egress.

2. Its 14 store racks (in addition to the external fuel station) provided for the carrying of an impressive variety of ordnance for suppressing enemy ground fire for long periods. It also had four 20mm guns mounted in the wings.

3. Its loiter time (up to five hours) enabled the A-1 pilots to remain in the SAR area for long periods, reducing the number of relief flights required both for RESCORT and strike roles.

4. The armor plating provided for the protection of the pilot and vital aircraft components enabled the A-1 to operate with acceptable risk in a small arms environment.

The venerable old bird had been long-threatened with extinction, at least in regard to its use by the USAF. Both Vietnamization programming and normal attrition were combining to spell the end of the 1SOS by the end of Fiscal Year (FY) 1971. Plans for force reductions in Thailand called for the turn over of the remaining A-1s to the Vietnamese Air Force (VNAF) under the Improvement and Modernization program. It was through intervention at the State Department level that this turnover was prevented.* [19]

The 1SOS was thus scheduled to be continued through FY 1972, although a number of its A-1s were scheduled to be delivered to the VNAF. As FY 1973 approached, the problem appeared to be surfacing again. Advanced planning called for between 10 and 15 A-1s to be stationed at NKP--hardly enough to support SAR operations alone. Whether the State Department would step in again, or what effect the enemy's 1972 spring invasion of SVN would have, remained to be seen. What was known, however, was that the finding of a suitable replacement for the A-1 in the SAR operation was difficult to imagine. Colonel Sohle said on the subject:

> *We still say there has been no aircraft developed to replace the A-1 to support the tactics now employed--maybe the tactics can be changed, but in the present situation, we don't know.* [20]

---

*The A-1 was retained for other covert missions, as well as for SAR operations.

OV-10

The OV-10 was proving to be a worthy addition to the SARTF by the end of 1971. It had neither the firepower nor the survivability to function as the A-1 did, but there were advantages to the OV-10 also. These advantages will be discussed in the "Operations" section, but generally speaking, they were:

1. The OV-10 FACs (as were all FACs) were more familiar with likely SAR areas than the Sandy pilots could be expected to be. They were likely to be in the area when the trouble began and they could locate the survivor and direct airstrikes against enemy positions while the SAR force was enroute.

2. A very special OV-10--the "Pave Nail"--was equipped with sophisticated electronic gear which enabled it to pinpoint and maintain a survivor's position. Its gear also gave the Pave Nail the capability of directing extremely accurate fire against enemy positions.

With the diminishing number of A-1s, the need for this type of assistance was becoming more critical. The time was approaching when the SAR force could no longer be launched without being assured that there was indeed an objective, and that the area was permissive enough to allow a rescue attempt.[21/] Specifications of the OV-10 were:[22/]

1. It carried a pilot and an observer.

2. It had provisions for carrying four external stores as well as four 7.62mm guns. It could carry additional munitions or a single external fuel tank on a centerline store station under the fuselage.

3. It had two turbo-prop engines and was capable of single engine flight.

RESCAP Aircraft

The Rescue Combat Air Patrol (RESCAP) consisted of all the additional tactical resources that could be brought to bear on the enemy's opposition to a SAR effort. This force included specially configured A-1s capable of laying smoke screens around the survivor and "fast-movers," such as the F-4 for SAM suppression and protection against MIGs. Against heavy defenses, the fast-movers were required to neutralize the area to a degree where the slow moving Sandy/Jolly team could expect to survive during a pickup attempt.

In summary, the SARTF was composed of any and all resources that could be of use during a SAR operation. The command and control of such a diversified force was a truly complicated matter. On occasion the control broke down, but it is to the system's credit that it functioned as well as it did. The manner in which all these elements were meshed in accomplishing the SAR mission will be covered in Chapter IV, Operations.

SYSTEMS

Following is a discussion of some of the major systems and subsystems that were considered necessary for improving the SAR operation in SEA. While final disposition had been made on some of the systems, others awaited further action as the reporting period ended.

Limited Night Recovery System

The need for a night recovery system was first expressed in Southeast Asia Operational Requirement (SEAOR) #114. It was originally envisioned that a night SAR system would enable rescue helicopters to search for, locate, and recover downed airmen at night and during low visibility conditions. The SEAOR was later converted to Combat Required Operational Capability (CROC) 11-70. When the project was declared complete on 1 May 1971,[23] three years after it was initiated, it was more limited than originally conceived.

The Limited Night Recovery System (LNRS) known as "Pave Imp" was what finally evolved. It consisted primarily of Low Level Light Television (LLLTV), a door mounted Night Observation Device, special goggles to improve the crew's night vision, and an automatic approach and hover capability. The system had undergone considerable development and technical difficulties, but MAC announced on 26 February 1971 that initial testing had been successfully completed and that Pave Imp was ready for SEA deployment.[24]

Three of the Pave Imp-modified HH-53s arrived at Udorn RTAFB on 28 March 1971 with two more following on 24 May. The five aircraft were flown by the 40ARRSq as directed by MAC Operational Test and Evaluation (OT&E) 6-6-71. The primary objectives during the SEA introduction were to:[25]

1. Evaluate the effectiveness of LNRS in a combat environment in accomplishing the primary day-night rescue missions.

2. Evaluate the maintainability and supportability of LNRS in a combat environment.

3. Evaluate the adequacy of operational tactics, techniques, and procedures developed during testing in the U.S.

4. Determine if established training requirements were adequate for SEA application.

5. Determine and document recommendations for improvements toward achieving an optimum day-night rescue system.

The final report of the Pave Imp evaluation was published in July 1971, after 220 hours were flown during the 90-day test. The evaluation confirmed that the system had a limited capability in night rescue operations--just what it was intended to have. It could be operated in a permissive environment, over relatively flat terrain, in VFR weather.[26/] The fact that Pave Imp fell so short of what SEAOR #114 had originally called for led to much speculation as to whether the system was worth retaining in SEA. However, the final report included the recommendation that continued use of the system should be made to the fullest extent possible within the limits of its capabilities.[27/]

After reviewing the final report, however, 7AF recommended the return of the Pave Imp aircraft to MAC/ARRS on a one-for-one basis, with 7AF receiving "combat ready" HH-53s in return. The rationale was that the system did not satisfy the requirement for a night recovery system and that the technicians needed to support Pave Imp added to the manpower ceiling problem in Thailand.[28/]

A reclama by HAC stated that due to cost overruns, the original objectives of a full night/weather recovery system could not be met and that recoverable funds had been directed toward providing a limited system. It was further argued that the LNRS equipment in no way degraded the overall SAR capability and that LNRS should be retained in SEA in order that additional experience might be gained in its use.[29/] In September 1971, 7AF agreed to the retention of Pave Imp and offered the following recommendations:[30/]

- All systems improvements should be fully tested and proven before deployment to SEA.
- Any testing required in SEA should be limited to development or refinement of tactics or procedures as they applied to SEA operations.
- Any requirement for additional personnel support should be kept to a minimum
- Initial qualification training for aircrews should be accomplished in the U.S.

An interview with the 40ARRSq Pave Imp Project Officer, Major Kenneth E. Ernest, disclosed the feelings of the users after the system had been operational for almost nine months:[31/]

> *As far as the LNRS is concerned, we have a system that right now works and I would say it is 90-95 percent reliable as far as doing what it is designed to do. It is designed to pick up a survivor who is on the ground, in the clear where we have slant range vision on him, and in rolling to flat terrain. What this negates is picking someone out of the trees, because you can't see a survival beacon--a beacon with an IR* light. Also you can't hover the helicopter by the side of a mountain. Those are problems. So what we have is a limited system that*

*Infrared.

works real well within its limits. The thing about Pueblo is over here is that if a survivor goes down in a friendly area, he is going to be picked up immediately; and if he goes down in the clear in an unfriendly area, he is going to be picked up by the enemy. In the 25 or 30 rescues in which I was intimately concerned, the survivor has lived and he has survived because he has gone down in a bad area--in other words, on the side of a karst or in a heavily wooded forest. The ones that get caught are the ones that go in on the [Ho Chi Minh] trail, and are in the clear and are just immediately scooped up. That's the trouble with our system. It's not capable of picking up someone from the trees or from the side of a karst.

When people hear us complain about the night system, what we are complaining about is that we do not have a complete night system. We are not bad-mouthing the system that we have.... People here like the system, but we don't want to be put in the position of having to use it in an area where it can't be used. We are constantly justifying why we didn't go in [for a night pickup] and we have to say, "well, we couldn't pinpoint the survivor," or "the dropping of area-denial munitions in the area negated the use of our night equipment." Those then are the problems.

Electronic Location Finder

Basic to the LNRS, and any subsequent improved night recovery system, was the need to pinpoint the location of downed aircrew members. As stated in the MAC ROC #27-70, "MAC's SAR/aircrew recovery forces require a capability to locate and expeditiously maneuver to a hover over a survivor in a combat environment." To completely satisfy the ROC, the following features were required:[32/]

1. Provision of terminal location to within ten feet at close ranges.

2. Ability to operate covertly, i.e., not betray the survivor's position to the enemy visually, audibly, or electronically by use of equipment standard to enemy ground forces.

3. Ability to operate through jungle canopies without significant degradation.

4. Be effective day or night under all weather conditions.

5. Be able to accommodate ground fire avoidance maneuvers by the rescue vehicle during approach.

6. Be compatible with and complementary to programmed night recovery systems.

7. Incorporate new handheld device consistent with the size and weight restrictions of aircrew survival equipment.

8. Incorporate new airborne equipment compatible with the limited payload capabilities of all rescue vehicles.

The experimental system which seemed most likely to approximate the requirements of the ROC was the Electronic Location Finder (ELF). The ground portion of the system consisted, basically, of a standard survival radio which provided signals to the rescue helicopter. The signals were displayed visually to the pilot enabling him to fly an approach to the survivor much in the manner of an instrument landing approach. The ELF was advertised by its manufacturer, the Cubic Corporation, as being capable of placing the rescue helicopter in a hover over the survivor with an accuracy of 25 feet.[33/]

An evaluation of the system was conducted at Hill AFB, Utah, and in the Panama Canal Zone. The tests were completed by February 1972 and the performance of the ELF system was considered satisfactory at both locations. It was learned, for example, that at two miles from the "survivor," flying at 130 knots airspeed as close as possible over 100-foot trees, a stable hover above the pickup location was consistently achieved in approximately two minutes.[34/]

As the reporting period closed, actions were underway to have ELF equipment installed in the LNRS-configured HH-53s in SEA by the end of 1972. In the interim, MAC wanted one of the two existing ELF sets installed in a SEA-based aircraft at the earliest possible date. The Air Force Systems Command concurred and authorized funds for the technical support and installation.[35/]

Electronic Defensive Systems

By 1972, the proliferation of sophisticated enemy radar-controlled defenses reached the point where the 3ARRGp requested electronic equipment which would offer protection against AAA and SAM firings. The request was made by 7AF in the form of two Combat ROCs--4-72 for the HC-130P, and 6-72 for the HH-53.

Combat ROC 4-72 stated the requirement for Electronic Countermeasure (ECM) and Radar Homing and Warning (RHAW) systems for the rescue HC-130Ps. To enable the HC-130P aircraft to detect and counter enemy radar-controlled weapons, the desired capabilities of the systems included:[36/]

A. RHAW

1. Visual and aural presentations which would indicate the presence of a threat.

2. Visual indications of the relative strength of the threat signal.

3. Visual indications of the relative bearing from the aircraft to the threat.

4. Discrimination between various types of threat signals, i.e, SAM, AAA, and airborne intercept radar.

B. ECM

1. Provide simultaneous jamming of AAA radar, SAM target tracking radar, and SAM beacons. The jamming was to be of sufficient magnitude and duration to permit the HC-130 to egress from the area or modify its flight profile to negate effective tracking and guidance.

2. Consider deception techniques, such as the use of chaff.

In February 1972, it was requested that the above capabilities be provided to seven of the HC-130Ps then assigned to the 39ARRSq at Cam Ranh Bay AB. By the end of the reporting period, Hq Pacific Air Forces (PACAF) had validated Combat ROC 4-72, and MAC and Tactical Air Command (TAC) had concurred with the requirement.[37/] Air Force Logistics Command was working on a preliminary estimate, but it was undetermined at the time when the system would be made available for installation on the HC-130s. One problem delaying the project was that of finding a location on the aircraft to install the ECM pods. Installation on the wings was precluded by the requirement for the HC-130P to carry in-flight refueling pods. The problem had yet to be resolved by the end of March.[38/]

Similar equipment was requested for 13 HH-53s of the 37ARRSq and the 40ARRSq. In a 21 March 1972 message concerning Combat ROC 6-72, 7AF stated in part:

> *Aerospace Rescue and Recovery HH-53Cs operating within hostile environments in SEA do not possess the capability to counter threats imposed by radar controlled weapons (e.g., SAM, AAA). Mandatory operations often*

cause penetration of lethal threat envelopes while in transit to/from the recovery area, or during the actual recovery operation.

According to the message, the solution to the problem was to install ECM equipment on the HH-53C capable of providing simultaneous protection against[39/] AAA radar tracking/fire control systems, SAM radar tracking/guidance systems, and SAM beacon signals. Headquarters PACAF recognized the importance of providing ECM equipment to the HH-53s but pointed out several problem areas that would have to be overcome. Some of these were:[40/]

1. The weight of the ECM gear might necessitate a tradeoff in other equipment and/or performance capability which could affect the HH-53 in accomplishing its primary mission.

2. During SAR operations, it was sometimes necessary to jettison as much weight as possible to improve hovering capability. While ECM gear would represent a considerable weight reduction, jettisoning would not be acceptable due to technological compromise and cost considerations.

3. Due to the HH-53's hugh rotor disk, it was suspected that a large amount of jamming power would be required to preclude radar burn through at greater than acceptable ranges. (When the Radar Cross Section (RCS) figures became available, PACAF was proved correct. The RCS for the HH-53 was 28 square meters--approximately the same as for the B-52.)

At the end of March 1972, PACAF was withholding validation of Combat ROC 6-72 until the problem areas could be investigated and reasonable solutions identified. At the same time, MAC concurred with the requirement, stressing that the weight goal be 350 pounds or less

and that the equipment should be sufficiently automated to permit operation by the existing crew.[41/]

The Madden Kit

Named after one of its developers, Captain James R. Madden, the "Madden Kit" was designed to overcome deficiences inherent in air-deliverable emergency kits. An earlier kit, no longer in use in SEA, was the CTU-1A. It was a large kit (eight feet long) carried by fast movers and designed primarily for a more permissive Escape and Evasion (E&E) environment. A primary problem with the CTU-1A was its tendency to become damaged on impact thereby rendering it difficult for the survivor to open. Also, the CTU-1A had little application during a relatively short-term SAR operation. It was difficult to drop near the survivor and the items contained in the kit were of the type needed for an extended E&E effort. A lack of evidence of its usefulness led to the CTU-1A being dropped from the inventory in SEA.

Another kit--the A-13--was a parachute-delivered box designed to be dropped from slow movers like the O-1 and O-2. Its shortcomings stemmed from the requirement for a parachute which made it difficult to place near a survivor in hiding and made it easy for the enemy to spot. Often the parachute hung up in trees; if the chute failed to open, the impact resulted in the survival items being damaged beyond use. The A-13 was still in use at the end of the reporting period but had proved of little use during contested SAR operations.[42/]

Noting these deficiencies, Captain Madden and others of the 56SOW set about to develop locally an air-deliverable survival kit more specifically tailored to the SAR needs. A salvaged flare canister was fitted with lugs compatible with the A-1 aircraft and designed to hold any survival gear that might be needed. Tests were conducted in the local area to improve the basic design. Fins were added for more stability and various shock absorbing nose cones were experimented with. The A-1 pilot had the option of extending the fins of the kit by dropping it "armed" or he could drop it "safe" which caused the fins to remain retracted. The kit was intended for pinpoint delivery with the survivor in sight. Since the survivor was the target, the pilot of the delivery aircraft had no room for error in armament selection when other ordnance was carried.[44/]

As of May 1971, five kits had been dropped during SAR operations. All the drops were acceptable, the closest being two feet from the objective and the furthest within 20 meters.[44/]

CHAPTER III

PERSONNEL

TRAINING

During 1971 and early 1972, units of the 3ARRGp were forced to maintain large aircrew training programs. Shortages of pilots qualified as aircraft commanders in the HH-53, HH-43, and HC-130P aircraft made a full upgrade training program essential. A large number of the HH-53 pilots arriving in SEA were converted fixed-winged pilots, with the result that the experience level of the helicopter crews was rapidly decreasing. The squadrons were able to keep pace with the training requirements although there was always the prospect that, as had happened before, battle damage could result in a lack of spare aircraft available for upgrading programs.[45/]

Limited Night Recovery System Training

HH-53 pilots arriving at the 40ARRSq were not qualified in the LNRS, necessitating initial qualification through in-theater training. One of the primary problems in providing this training was the difficulty in locating, and obtaining approval to use, off-base training areas in Thailand.[46/] Considerations in choosing a training site included:

1. The need for adequate security.
2. The absence of lights on the ground which would interfere with the LNRS.
3. The need for terrain similar to that in which the system would most likely be operated.

In the spring of 1971, during the evaluation of the LNRS, several sites were identified for future use by the 40ARRSq and the 3ARRGp. One such site was the Nam Phung Special Forces camp in Sakon Nakhon, approximately 40 miles southwest of NKP. However, a letter from the U.S. Embassy in Bangkok stated in part that: "in absolute terms the risk of hostile action near Nam Phung may not be great; but we would be remiss in authorizing repeated U.S. helicopter landings at night in an area so close to the major pockets of armed insurgency in Northeast Thailand."[47/]

The search for suitable night training areas continued, and at one time a site near Korat RTAFB was used. However, the distance involved made it impractical. At the end of the reporting period three sites were being used; Seng Mountain, 55 miles north of NKP; Camp Hunky, 37 miles southwest of NKP; and an area seven miles west of NKP.

SEA King Mission Simulator

A procedure for simulating the complex King mission was developed both to train newly arrived crewmembers and to provide continuation training for aircrew personnel of the 39ARRSq (later Det 4). The simulator had been in use for approximately three years--first at Tuy Hoa AB, then at Cam Ranh Bay AB, and finally at Korat RTAFB. The syllabus of instruction for the simulator was designed to bring crewmembers to a level of proficiency that would enable them to cope with the problems inherent in a complicated Combat SAR operation.

The physical layout of the simulator was very simple. Five interphone jack boxes were connected in one room for the instructors. In

another room, four boxes were connected for the aircraft commander, copilot, navigator, and radio operator. The simulator did not have a mechanical function; all training was conducted by voice with the instructors acting as different control agencies, flight commanders, FACs, or anyone else who might be involved in an actual Combat SAR operation. The training was based on the instructors establishing an objective and teaching the trainees methods for achieving a successful conclusion.[48/]

Primary emphasis was placed on the command and control of the Combat SAR mission and King's role in coordinating the myriad of details associated with a SAR operation. The simulator, then, was a procedures trainer and the instruction progressed from more simple problems such as assisting an aircraft in distress to those problems requiring the control of large numbers of aircraft in support of an extended SAR mission.

The simulator instructors called upon their experiences in actual Combat SAR operations to inject unique conditions, thus providing the crewmembers with the best and most current combat tactics training possible. Considering that an HC-130P crewmember could conceivably spend an entire tour in SEA without experiencing an actual SAR mission, the importance of continuation training in the simulator was readily apparent. A detailed description of the King responsibilities is presented in Chapter IV, Operations.

A-1 Training Problems

Faced with the continued drawdown in A-1 resources, an intense problem was developing in maintenance of pilot proficiency in the 1SOS at NKP. In the past, the varied missions of the A-1 had provided the pilots with much-needed experience in ordnance delivery, but if the number of A-1s was reduced, as feared in early 1972, the point would soon be reached where pulling the SAR alert would take almost the entire force.

Hoping to alleviate the problem, the 56SOW requested that the A-1 Sandy alert at Da Nang AB be returned to NKP, and that the alert aircraft at Ubon RTAFB be rotated every three days rather than five. It was hoped that in this way, more aircraft would be available for training. Flying more airborne alert was another way to increase the proficiency of the A-1 pilots. However, these were all short-range solutions to a problem that would worsen unless more A-1s, or a suitable substitution, became available for the role of RESCORT aircraft.[49/]

PACAF Jungle Survival School

It had long been a requirement that all aircrew members enroute to combat assignments in SEA attend the Jungle Survival School (JSS) at Clark AB in the Philippines.[50/] The school provided the crewmember with intensive training in survival, evasion, resistance, and escape. The student also gained knowledge of SAR operations and what was expected of him in the event he should ever require the services of the SAR force.

The importance of what the school taught was emphasized by Lieutenant Colonel Clifford E. Brandon, Commander, 40ARRSq, when he addressed the members of a SAR conference at NKP on 26 March 1972. He said: "All the rescue forces in the world can't help a survivor on the ground if he doesn't understand SAR procedures and can't assist in his rescue."[51/] The course included both academic training and an opportunity to put to practical use the information learned in the classroom. When a crewmember graduated from JSS he had hopefully become knowledgeable in SAR procedures and familiar with the equipment used in SAR operations in SEA.

Following their rescue, the crew of Nail 31, an OV-10 shot down on 18 March 1972, had the following to say about the quality of the training they received.[52/]

"All the equipment worked as advertised. I think my training duplicated the situation very well," Lieutenant David G. Breskman, pilot, Nail 31.

"I was as well prepared as I could possibly be for an E&E situation. My survival training, E&E briefings, and pre-strike area briefings were of great assistance in my successful E&E and recovery," Captain Steven L. Poretsky, weapon systems officer, Nail 31.

Informal Training

To insure that the crewmembers retained the information they had received at JSS, informal continuation training was given in the theater.

Members of the rescue forces made regular scheduled visits to the combat units to emphasize[53/] both what the survivor could expect from the SAR forces during a rescue operation and what the survivor should do to help the rescue forces.

In this manner, the combat aircrew members (including those on carriers) received the latest information on new equipment and tactics used in SAR operations. The crewmembers were further updated on SAR equipment, tactics, and requirements through the individual units' life support section and mission briefings.

MANNING

During 1971 and early 1972 some 3ARRGp personnel shortages occurred but were largely of a temporary nature. For the most part, manning was in line with in-being authorizations or mission requirements. For example, the pararescue manning level in SEA was maintained at 85 percent of that authorized as a result of a command management decision. The reason for the 85 percent figure was to insure that all PJs in SEA were used to the maximum extent possible.[54/] On the other hand, there were flight mechanic manning difficulties in early 1971 which were due in part to the overages in non-SEA units. This required a realignment of resources and, subsequently, the flight mechanic manning stabilized.[55/]

Maintenance personnel manning had been in accord with total authorized strength although the skill levels were not always those authorized. While the squadrons announced their desire to be fully manned according to skill level, it was pointed out by personnel offices

that the airmen assignment manual allowed for skill as well as grade substitution.[56/]

Helicopter pilot manning was considered adequate. While training output of helicopter pilots had not consistently matched the needs due to attrition and cancellation, management actions such as the reduction in UE aircraft in the using organizations had stabilized the helicopter manning situation by the end of the reporting period.[57/]

AWARDS AND DECORATIONS

Probably the most decorated group in Air Force history, the 3ARRGp continued to receive awards and decorations at a prodigious rate. Between January 1966 and the beginning of 1971, the group had already gathered more than 13,000 awards and decorations. During 1971 and the first quarter of 1972, the group received the following decorations.[58/]

Decoration	1st Qtr 71	2nd Qtr 71	3rd Qtr 71	4th Qtr 71	1st Qtr 72
Silver Star	0	11	0	0	0
Distinguished Flying Cross	40	37	61	35	89
Bronze Star	17	16	21	4	15
Air Medal	518	120	302	67	360
Air Force Commendation Medal	72	40	73	10	52

Decoration	1st Qtr 71	2nd Qtr 71	3rd Qtr 71	4th Qtr 71	1st Qtr 72
Purple Heart	6	1	2	0	14
Other	0	0	0	0	0
TOTAL	653	225	459	119	530

Thus, during the 15-month period of this report, the group had received 1,986 awards and decorations. In addition, the group was awarded its third Presidential Unit Citation for sustained gallantry in Vietnam for the period 1 February 1969 through 30 April 1970. Figures were not available on the number of decorations awarded crewmembers from other squadrons flying in support of SAR operations, but the number would undoubtedly be impressive.

CHAPTER IV

OPERATIONS

With a few exceptions, the alert posture of the SAR forces remained relatively stable during the reporting period. The positioning of the forces was designed to provide coverage in the areas where strike activity was taking place. This report covers the period through 31 March 1972 and therefore does not document the events that took place following the enemy's spring invasion.

Tactics and concepts were constantly evaluated and changed as required. Almost every SAR operation provided new experiences, and periodic SAR conferences were held by the 56SOW at NKP to determine how the new "lessons learned" could be used to enhance future operations. The rescue operations described in this chapter were chosen because each presented unusual problems that were overcome and, in some cases, provided a basis for altering existing procedures.

SAR ALERT POSTURE

At the end of 1971 the SAR-dedicated aircraft were positioned on alert as follows:[59/]

1. HC-130P. Two HC-130P King aircraft were fragged daily for a first-light to last-light orbit. The orbit was normally flown from NKP to the Paksane area, but was changed as required to provide maximum coverage of the daily 7AF fragged strikes. Additionally, an HC-130P stood 30 minute

alert at Udorn to support the 40ARRSq's LNRS night alert commitment. Another King aircraft stood 30 minute alert at Cam Ranh Bay from first-light to last-light. The latter aircraft also provided a 24-hour alert back-up for use as an AMC or tanker, should the need arise. It was on a 45 minute alert during the nighttime hours.

2. HH-53C. Two HH-53C Jolly Greens orbited over the Gulf of Tonkin south of the Demilitarized Zone (DMZ) when required. These 37ARRSq helicopters were on station while U.S. reconnaissance aircraft were flying in the eastern half of Route Package I (between the DMZ and 18 degrees north in NVN). When not flying the orbit, the two aircraft were on 15 minute daytime and 45 minute nighttime alert at Da Nang AB.

The 40ARRSq provided two Jolly Greens for 15 minute alert during the day at both NKP and Ubon RTAFBs. These aircraft were also used for airborne alert over central and southern Laos. Two LNRS-equipped helicopters maintained 45 minute alert at either NKP or Ubon and were supported by the HC-130P on alert at Udorn.

3. A-1. Two A-1 Sandys from the 1SOS pulled 15 minute alert at Da Nang during the day. At NKP, four Sandys were on 15 minute alert with two of them fragged to orbit with the Jolly Greens over central Laos. Two more A-1s were on 15 minute alert at Ubon during the day. These last two escorted the Ubon-based Jolly Greens during their orbits over southern Laos.

4. HH-43. Fifteen HH-43F Pedro helicopters of the 3ARRGp were stationed at six Dets throughout RVN and Thailand. Additionally, two Pedros were stationed with both the 37ARRSq and the 40ARRSq. While primarily used for the LBR mission, these helicopters performed the combat aircrew rescue mission when necessary and as requested by the JRCC.

5. Changes in the SAR Alert Posture. Until 5 December 1971, the 37ARRSq had operated an FOL at Bien Hoa AB, RVN. The alert commitment there had been two Jolly Greens and two Sandys on 15 minute day alert.

On 31 March 1972 the 39ARRSq at Cam Ranh Bay was inactivated. At that time the HC-130s were in place at Korat RTAFB as part of Det 4 of the 3ARRGp. Following the move of the Kings, alert requirements at Udorn and Cam Ranh Bay were no longer needed and were therefore discontinued.

In March 1972, the 56SOW was seeking approval to discontinue the Sandy alert at Da Nang. The reduction of A-1 resources had reached the point where it was felt that two extra A-1s at NKP were necessary to provide the pilots of the 1SOS with adequate training. Similarly, plans were underway to rotate the A-1s from Ubon on a three-day cycle rather than five days to provide additional flying time to and from NKP.[60/]

TACTICS

The tactics and techniques to be employed by the SARTF during SAR operations were outlined in 7AF Manual 64-1, Search and Rescue-Southeast Asia. The manual detailed the individual operational procedures to be used

by each of the components of the SARTF, and the overall command and control relationships of the integrated force. Suggestions were solicited from those involved in SAR operations to keep the manual constantly updated to meet changing tactical situations. As current and detailed as it was, however, it could never be considered the last word on SAR tactics and procedures. According to the manual itself; "Each recovery encounters new problems which must be met with flexibility and ingenuity."[61/]

It was clear that for SAR operations, where each mission presented a unique situation, there was no substitute for experience. In October 1970, when Colonel Sohle was commander of the 3ARRGp, he said:[62/]

> *Our development of present SAR capability has been a history of relearning lessons already learned by someone else, but who unfortunately could not or did not document it for others to profit by. We feel that in AF Manual 64-1 this has been overcome or at least minimized. Of course, it is impossible to substitute any document for actual experience. You could read every item ever written on SAR, but there is no alternative to the learning process of involvement in a combat recovery mission.*

The composition of the SARTF during the period of this report remained the Jolly Green/Sandy team, a FAC, an AMC RESCAP aircraft, and any other resources deemed necessary in completing a SAR operation. The basic tactics of the individual components of the SARTF were as follows:

Jolly Greens. When a scramble was ordered, the Jolly Greens proceeded in flights of two to the SAR area where they waited at a designated orbit

point until the order was given to begin the pickup attempt. One helicopter was briefed as Jolly Green "Low" and would ordinarily be the one to make the survivor pickup. The other Jolly was the "high" bird and served as a backup for Jolly Green Low.

When helicopters were called in for the pickup, the high helicopter orbited over the pickup area at a safe altitude. If weather or hostile activity prevented orbiting directly over the area, the high Jolly Green would orbit at the most suitable position from which the recovery operation could be observed. The pilot would advise the SAR force of any enemy activity, and could act as a FAC.

While enroute to the recovery site, the low helicopter pilot computed the aircraft performance and the fuel required to effect the recovery plus the fuel reserve required for enroute time to the nearest airfield or to a tanker. The best approach was considered to be a low-altitude, high-speed run toward the survivor's position. If enemy activity was not prohibitive, an attempt was made on the first pass to stop over the survivor. At the beginning of the Jolly Green's pass, the survivor was briefed to be ready to use a smoke flare, GYRO JET flare, or any visual signal to pinpoint his position. The helicopter crew watched for enemy fire during the approach and returned fire if encountered.

If the enemy fire was too severe, the approach was discontinued and the helicopter took evasive action while climbing away from the scene.