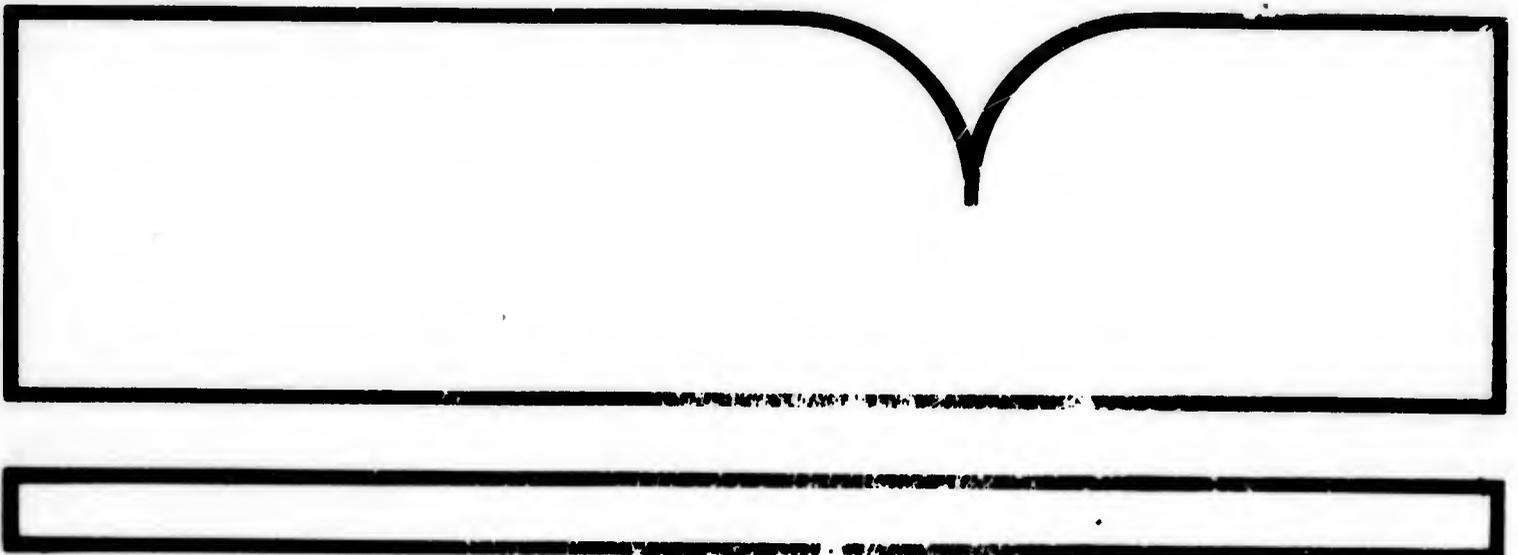


OPERATION REDWING  
COMMANDER TASK GROUP 7.3 - FINAL REPORT

J.H. Wellings

Defense Nuclear Agency  
Washington, DC

Mar - Aug, 56



UNANNOUNCED

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EXTRACTED VERSION

# OPERATION REDWING

## Commander Task Group 7.3 Final Report

March-August 1956

Pacific Proving Grounds

### NOTICE

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Extract version prepared for:

Director

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
<p>Operation REDWING was conducted at the Pacific Proving Ground during the spring and summer of 1956. The main effort of the Navy task group (Task Group 7.3) was concentrated at Bikini Atoll in support of large yield shots. The broad mission of Task Group 7.3 was to provide the necessary naval support, including an evacuation capability, required by Joint Task Force Seven. Task Group 7.3 carried out the following assigned tasks: 1) conduct security and safety patrols (air and surface ship); 2) provide surface ship transportation between Eniwetok and Bikini and other atolls; 3) provide shipboard command, control and communications facilities for CJTF-7 and the task groups; 4)</p>		

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Abstract (Continued)

provide shipboard facilities to accommodate elements of the Joint Task Force while afloat, including pre-shot evacuations as directed by CJTF-7 and; 5) provide support to scientific projects as requested.

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## FOREWORD

This report has had classified material removed in order to make the information available on an unclassified, open publication basis, to any interested parties. This effort to declassify this report has been accomplished specifically to support the Department of Defense Nuclear Test Personnel Review (NTPR) Program. The objective is to facilitate studies of the low levels of radiation received by some individuals during the atmospheric nuclear test program by making as much information as possible available to all interested parties.

The material which has been deleted is all currently classified as Restricted Data or Formerly Restricted Data under the provision of the Atomic Energy Act of 1954, (as amended) or is National Security Information.

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It is the belief of the individuals who have participated in preparing this report by deleting the classified material and of the Defense Nuclear Agency that the report accurately portrays the contents of the original and that the deleted material is of little or no significance to studies into the amounts or types of radiation received by any individuals during the atmospheric nuclear test program.

ABSTRACT

Operation REDWING, a Joint Atomic Energy Commission-Department of Defense effects test series of atomic weapons and devices, was conducted by Commander Joint Task Force SEVEN at the Pacific Proving Ground during the spring and summer of 1956. The Chief of Naval Operations was the Executive Agent of the Joint Chiefs of Staff for the conduct of the test.

There was a total of 17 weapons and devices detonated using both Eniwetok and Bikini Atolls as detonation sites. The main effort of the Navy task group (Task Group 7.3) was concentrated at Bikini Atoll in support of large yield shots. The list of shots detonated is as follows:

<u>SHOT NAME</u>	<u>DATE DETONATED</u>	<u>ATOLL</u>
LACROSSE	5 MAY	ENIWETOK (Ground)
CHEROKEE	21 MAY	BIKINI (Air Drop)
ZUNI	28 MAY	BIKINI (Ground)
YUMA	28 MAY	ENIWETOK (Tower)
ERIE	31 MAY	ENIWETOK (Tower)
SEMINOLE	5 JUNE	ENIWETOK (Ground)
FLATHEAD	12 JUNE	BIKINI (Barge)
BLACKFOOT	12 JUNE	ENIWETOK (Tower)
KICKAPOO	14 JUNE	ENIWETOK (Tower)
OSAGE	16 JUNE	ENIWETOK (Air Drop)
INCA	22 JUNE	ENIWETOK (Tower)
DAKOTA	26 JUNE	BIKINI (Barge)
MOHAWK	3 JULY	ENIWETOK (Tower)
APACHE	9 JULY	ENIWETOK (Barge)
NAVAJO	11 JULY	BIKINI (Barge)
TEWA	21 JULY	BIKINI (Barge)
HURON*	22 JULY	ENIWETOK (Barge)

\*HURON device had failed during final countdown on 2 July at Bikini Atoll. The device was returned to Eniwetok, made ready to fire again and became the last detonation of the REDWING series on 22 July 1956.

The Navy task group build-up phase began on 1 September 1955, with the reporting of the Task Group Commander, Rear Admiral Joseph H. Wellings, U.S. Navy. The operational phase commenced on 16 January 1956 when the first units of the task group deployed to the Pacific Proving Ground.

Task Group 7.3 was comprised of the following ships and units:

USS ESTES (AGC-12), CTG 7.3 Flagship	USS SIOUX (ATF-75)
USS BADOENG STRAIT (CVE-116)	USS CHICKASAW (ATF-83)
USS CURTISS (AV-4)	USS LIPAN (ATF-85)
USS CATAMOUNT (LSD-17)	USS ABNAKI (ATF-96)
USS KNUDSON (APD-101)	USNS FRED C. AINSWORTH (T-AP-181)
USS JAMES E. KYES (DD-787)	USNS T-LST-618
USS SHELTON (DD-790)	USNS T-LST-306
USS SILVERSTEIN (DE-534)	YC-1420
USS MC GINTY (DE-365)	YCV-10
	YON-182
USS GEORGE EASTMAN (YAG-39)	HMR-363 (15 HRS-3)
USS GRANVILLE S. HALL (YAG-40)	VP-1 (15 P2V-5)
USS CROOK COUNTY (LST-611)	

TG 7.3 Boat Pool (Bikini) - 19 LCM, 1 LCPL, 2 LCPR, 2 24' personnel boats, 1 YFN, 5 LCU.

TG 7.3 Boat Pool Eniwetok Detachment - 4 LCM, 2 LCPL.

The broad mission of Task Group 7.3 was to provide the necessary naval support, including an evacuation capability, required by Joint Task Force SEVEN. In execution of this mission Task Group 7.3 carried out the following assigned tasks; (1) conduct security and safety patrols (air and surface ship) as required, (2) provide surface ship transportation between Eniwetok and Bikini and other atolls as required, (3) provide shipboard command, control and communications facilities for CJTF-7 and the task groups, (4) provide shipboard facilities to accommodate elements of the joint task force while afloat, including pre-shot evacuations as directed by CJTF-7 and, (5) provide support to scientific projects as requested.

The support of scientific projects and the Navy ships and units involved during Operation REDWING are listed below:

Telemetering.....	1 LSD, 1 APD
Lagoon Survey.....	1 LCM
Ocean Area Survey & Sampling.....	2 DE
Moored Sample Collection in Lagoon.....	2 YFNB
Deep Sea Sampling.....	1 ATF
Fall-out Measurements.....	2 YAG, 1 LST
Operation and Fall-out Collection Control Center for Ships & Aircraft.....	1 AGC
Sample Handling Center.....	1 YC
Master Raydist Station.....	1 CVE
Early Fall-out Survey.....	3 P2V
Blast Thermal & Gust Effects Measurements.....	1 A3D, 1 P2V
Upper Wind Measurements.....	2 DD
Timing and Firing Station.....	1 AV
Personnel Decontamination.....	1 AGC, 1 CVE, 1 TAP
RadSafe Laboratory.....	1 TAP
Washdown Effectiveness.....	1 LST

The administration and operation of the Navy task group during the operation was highly successful. All problems of consequence were resolved to the benefit and satisfaction of the parties concerned which is of paramount necessity for the success of an operation of this nature.

The performance of duty of all commands and personnel of the task group was carried out with exceptionally high standards.

Morale was exceedingly high throughout the test series. Peaks were evident with the detonation of each shot. Delays were relatively few and the revisions of the shot schedule to expedite the completion of the operation, where possible, was a great factor in maintaining the high degree of morale.

Radiological decontamination or blast damage did not preclude use of the adequate Navy recreation facilities at either Bikini or Eniwetok Atolls.

Excellent over-all mail service was enjoyed throughout the operation.

There was no known concern over the possibility of receiving, or having received, harmful radiation dosage. Fortunately, anxiety from this concern and other detriments to morale such as frequent shot delays, extension and indefinite termination of the operational period, delayed mail and inadequate recreation facilities ashore did not exist during Operation REDWING as reported in previous operations at the Pacific Proving Ground.

The final report of Commander Task Group 7.3 is contained in detail, by staff sections, after the following CONCLUSIONS and RECOMMENDATIONS which have been extracted therefrom and are considered to be the most pertinent and important:

#### INTERIM STAFF

##### Conclusion:

The lack of an adequate number of experienced personnel combined with the late commencement date of the build-up phase adversely affected the essential close liaison with Fleet and Type Commanders whose ships and aircraft not only participated in Operation REDWING but, almost without exception, were required to undergo various alterations prior to such participation.

**Recommendation:**

That the strength of the interim Task Group 7.3 staff be approximately half its operational strength, to provide experience and continuity, and that these personnel should be selected from staff members who participated in the preceding operation.

**OPERATIONAL STAFF**

**Conclusion:**

That the regular operational staff was planned and organized to function in an operation similar to CASTLE and not in sufficient strength to completely meet the needs of Operation REDWING.

**Recommendation:**

That the operational staff of Commander Task Group 7.3 be planned to provide a staff large enough for atomic tests of this scope where both atolls are utilized.

**FLEET MANNING PERCENTAGE**

**Conclusion:**

That normal fleet manning percentages do not provide adequate personnel to meet with the demands of operations in the Pacific Proving Ground of the duration and magnitude of Operation REDWING. This is aggravated by hot humid weather, working and living confined to ships, limited recreation and boredom; all of which greatly decrease human efficiency.

**Recommendation:**

That ships and units participating in atomic test series in the future be manned at 100 percent of actual allowance.

**LOSSES (EMERGENCY LEAVE & HOSPITALIZATION)**

**Conclusion:**

Personnel losses due to emergency leave and hospitalization were very low resulting in 1.3 percent for emergency leave and 0.9 percent for hospitalization. These losses did not seriously hamper the operation as priority transportation was provided in every case and all but a very few of those going on emergency leave were promptly returned to their unit at the PPG.

**Recommendation:**

That in future operations expeditious handling again be given in personnel movements of this type.

**PERSONNEL STABILIZATION**

**Conclusion:**

Stabilization should have began earlier, especially as almost all the Navy ships and units were assigned as of 19 August 1955.

**Recommendation:**

That personnel be stabilized at least three months prior to the operational phase of future operations of this nature.

**DISCIPLINE**

**Conclusion:**

That discipline cases and problems can be expected to be less during operations due to the retention of only good security risks and the restrictive nature of the Pacific Proving Ground that permits almost no unsupervised activity of Navy personnel.

**Recommendation:**

That, should future personnel security requirements be less than in previous tests, known troublemakers and offenders should be disqualified so as to continue the elimination of individuals poorly adjusted socially.

**U.S. AND GUARD MAIL**

**Conclusions:**

That the planning for mail handling for Operation REDWING was sound as evidenced by the excellent service obtained.

That the physical location of APO 436 in a limited access area on Enyu Island, Bikini Atoll was detrimental to prompt pickup and delivery of mail by ship's mail clerks.

**Recommendations:**

That, where at all possible postal facilities serving afloat units be located near piers or other areas of easy access by boats.

That the utilization of a mobile U.S. Navy Postal Unit for Navy ships and units at Bikini Atoll be considered in planning for the next series of atomic tests in the Pacific Proving Ground.

#### RECREATION

##### Conclusion:

The completion of the camps was delayed by the lateness of the approval of the construction coupled with the fact that, when finally approved, contractor personnel were occupied fully with construction of higher priority jobs.

##### Recommendation:

That Camps Parsons at Eniwetok Atoll and Camp Blandy at Bikini Atoll be maintained between operations for future Navy use.

#### SECURITY

##### Conclusion:

That all ships in the Pacific Fleet did not hold or were not aware of the existence of CINCPAC serial 020 dated 1 April 1952 and its requirements for entry and reentry of personnel in the Pacific Proving Ground.

##### Recommendation:

That CINCPAC serial 020 dated 1 April 1952 be revised to meet current requirements and be reissued to all ships and stations.

#### OPERATIONS (BUILD-UP PHASE)

##### Conclusions:

That the Operations Section of the staff of Task Group 7.3 was formed far too late on the build-up phase of the operation.

That effective liaison with various projects and with Task Group 7.1 in particular was not established early enough.

That adequate time was not available for thorough briefing of type commanders and individual ships and units prior to the operational phase.

##### Recommendations:

That the Operations Section of Task Group 7.3 remain manned and active during the planning phase as well as the build-up phase of the next

operation.

That every effort be made to make early assignment of naval forces for next operation.

That early and effective liaison be established with Task Group 7.1 and that all requests for naval participation as well as special installations in naval ships be discussed and cleared by both Task Group 7.1 and Task Group 7.3 before submission to CJTF-7.

That liaison with type commanders be started when the concept of the next operation is known and intensified as forces are assigned.

That liaison with participating naval activities not type commanders, such as NRDL, ONR, NOL, and NOTS, be initiated and maintained.

#### MOVEMENT & ASSEMBLY OF UNITS

##### Conclusions:

The division of the group into ten task units as originally planned was too minute and in practice the task unit commanders were not required to function as such with a few exceptions. This concentration of control did not hinder the operation but enhanced its efficient conclusion.

Movement of ships and units piecemeal from the West Coast and Pearl Harbor did not hamper successful organization of the task group. Task Group 7.3 was ready for full operation when required.

##### Recommendations:

Subject to remarks in other sections regarding liaison with type commanders and assigned ships, deployment of ships or units individually to the forward area is completely satisfactory and can be followed in subsequent operations.

Requirements, both operational and scientific, should be closely scrutinized in delineating the task organization with the idea of reducing the number of task units rigidly assigned. This would leave spare task unit designations available for assignment to special purpose groups.

## ON SITE OPERATIONS

### Conclusion:

Every opportunity must be taken as it occurs to conduct strictly naval shipboard training and to complete requirements of the type commanders in the competitive and training cycle.

### Recommendation:

That the operations staff of Task Group 7.3 on future operations remain alert to the requirement to schedule naval training at any available time and that full employment of this available time be made.

## HOSTILE ALERT PLAN

### Conclusion:

The Hostile Action Alert Plan, as conceived, was satisfactory.

### Recommendations:

That no more extensive Hostile Action Alert Plan be promulgated for future operations unless higher authority determines that security of the task force and task force installations is so paramount that special security forces with no other mission will be assigned.

If such determination is made, sufficient security forces be assigned with no other primary mission.

## SEARCH AND RESCUE

### Conclusion:

The SAR organization as provided was entirely adequate.

### Recommendation:

While SAR facilities available in the lagoon area are considered adequate with LCM, crash boat, helicopters and ships present, a fast sea-going surface crash boat is considered necessary in the event of forced landing outside of the lagoon area, particularly in the Bikini area where a strip alert UF type aircraft was not available for sea rescue. The wooden hulled crash boat assigned is not suitable for operations at sea and ships at anchor are not able to get underway soon enough to effect a rescue where speed is so essential.

## AIR PATROLS

### Conclusions:

A total of fifteen aircraft is considered necessary to give adequate surveillance to the established Danger Area and to accomplish the additional commitments which were required or added during the operation.

The probability of detecting surface fishing vessels utilizing APS-20 radar was considered to be one-hundred percent.

The available air navigational charts for the general area are inadequate.

### Recommendation:

The Hydrographic Office should prepare charts covering the following areas:

VR Series:	04-00 S to 25-00 N 144-00 E to 173-00 W
V30 & VL Series:	06-00 N to 22-00 N 152-00 E to 180-00

## WEATHER OBSERVATIONS

### Conclusion:

The data of the destroyers on weather station were a valuable aid in forecasting, and their local employment on shot nights aided in the late decisions.

### Recommendation:

While the two destroyers assigned to Operation REDWING did valuable service weatherwise, this use was a compromise between weather requirements and availability. Four destroyers would enable more distant, and therefore more useful weather stations to be used.

## RADLSAFE TRAINING

### Conclusion:

Operational radiological safety requirements were integrated with training so that personnel could understand exactly what was required and the reason for doing it. The maximum use of operational situations was made to supplement classroom training. Full advantage was taken of the only

realistic atomic defense and radiological safety situations now available to fleet units.

Recommendation:

That a greater number of personnel on duty at naval schools offering instruction in Atomic Defense and Radiological Safety should be ordered as technical observers to the naval task group during special weapon test operations.

RADIOLOGICAL SAFETY

Conclusion:

The procedures followed in obtaining, distributing, wearing, and collecting film badges for all personnel in Task Group 7.3, and the recording and reporting of their accumulated dosages were satisfactory. Close supervision of this program is necessary if dosage records are to be complete and accurate, and such supervision is very time consuming. Dosage control procedures were very successful. More frequent reissue and reading of film badges is desirable since the high humidity resulted in water marking of all badges to a density equivalent to several hundred milli-roentgens. Reporting all dosages received on "permanent" badges during the operation, as well as for "mission" badges, would provide for better dosage control.

Recommendation:

That close supervision of the film badge program be required in future operations. That film badges be renewed at least monthly in hot, humid climates, or that more effective protection of film from heat and moisture be developed. That reports of accumulated dosage for all personnel be made available to units as frequently as possible during future operations.

SHIP INSTALLATIONS

Conclusion:

There is much room for improvement in the area of planning for ships' installations for an operation of this type.

Recommendations:

That participating ships be nominated far enough in advance of the

operational phase to permit orderly planning.

That CTG 7.3 staff members in a group (Operations, Communications, RadlSafe, and Material) visit the task groups or other agencies who generate requirements for ship installations, to discuss fully these requirements, to understand the problem to be solved, and to submit recommendations as to how these requirements can best be solved on board ship. This may prevent later problems, such as, large requirements for AC power being placed on a DC powered ship, as was done in the case of the AINSWORTH.

That predeployment availabilities of participating ships be established by type commanders far enough in advance to permit orderly planning.

That when CJTF-7 forwards approved requirements from some other task group, authority to proceed and to expend funds be included. This will streamline the process and save much time.

That BuShips and type commanders be kept fully informed of intentions to make each ship installation, and that where necessary, approval be obtained in advance of all work.

That service craft requirements initiated by project personnel be reviewed by CTG 7.3 from an operational point of view.

#### REPLENISHMENT

##### Conclusion:

The lack of a deep water pier for Eniwetok Island causes undue handling of stores at considerable expense of manpower, transportation and time.

##### Recommendation:

That a deep water pier be constructed at Eniwetok; if a pier is not feasible then a causeway should be constructed on the reef between Parry and Eniwetok Islands in order to facilitate handling of stores and provisions by truck.

## FUNDING

### Conclusion:

The division of funding between services' expenses and extra military expenses provided a means for furnishing required ships, service craft and equipment with a considerable less expenditure of funds than if required equipment had to be purchased for atomic tests.

### Recommendation:

The Memorandum from Assistant Secretary of Defense (Comptroller) dated 9 March 1953, or a similar division of funding policy document be issued as an instruction by the Chief of Naval Operations or other competent authority.

## RADIOLOGICAL HAZARDS

### Conclusion:

The MPE of 3.9r for a thirteen week period as allowed by BuMed for Operation REDWING was strictly adhered to and there were no instances of overexposure of Task Group 7.3 personnel resulting from participation in the tests. The X-Ray technician on the USS BADOENG STRAIT (CVE-116) received 5.0 r X-Radiation of about 70 KV. There were two known instances in which individuals did not cover their eyes soon enough or removed their goggles or, uncovered their eyes too soon following the detonation. This was accompanied by pain in the eyes with the development of conjunctivitis in several hours which gradually subsided in 24-48 hours. No apparent permanent eye injuries have resulted.

### Recommendation:

That an adequate X-Ray machine with proper shielding be provided on the ship having the surgical facilities.

The procedures and training to prevent eye injuries to personnel viewing shots is adequate.

## COMMUNICATIONS LIAISON

### Conclusion:

That it is not sufficient to establish a workable communication plan or to insure the early placing of equipment orders. Close and continued contact must be maintained with other staffs, groups and ships to avoid

misunderstanding of requirements, needs, and ability to provide services or installations (particularly if non-Navy equipment is used).

**Recommendations:**

The Task Group 7.3 Communication Officer should establish a program of coordination and close and continued liaison with the ships of the task group to insure full knowledge of all the requirements which other groups place on Task Group 7.3, the efficiency and repair status of installed equipment, the status of all equipment orders, the status of new equipment and its installation and the status of communication personnel, their qualifications and training.

Frequency assignments should be ascertained at the earliest possible date, with a view towards establishing necessary equipment requirements. These frequencies and equipment requirements should be furnished to the ships of the Task Group at the earliest possible opportunity.

**SIDEBAND T-276(XC-1)/UR TRANSMITTER**

**Conclusion:**

The sideband transmitter proved to be approximately 98 percent efficient for voice transmissions and 85 percent efficient for straight teletype.

**Recommendation:**

Based on the performance given during Operation REDWING, it is recommended that this transmitter be given further tests and trials (particularly on voice transmissions). This transmitter is recommended for eventual Navy use, primarily on voice.

**AN/FRC 27 AND AN/TRC 34 EQUIPMENT**

**Conclusion:**

The range and dependability of this equipment were insufficient for use on a tactical net and/or during shot sorties. The flagship was never able to reach all ships on either the tactical or administrative nets.

**Recommendation:**

It is strongly recommended that equipment of this type not again

be installed aboard ships of this task group, and that only standard Navy equipment be used on the primary tactical net, and possibly on the primary administrative net.

#### SIGTOT-SAMSON EQUIPMENT

##### Conclusion:

This equipment proved to be extremely sensitive to the existing ambient noises normally found aboard ship and to the extremely unfavorable atmospheric conditions experienced. This condition was particularly true during the month of May.

##### Recommendation:

It is highly recommended that SIGTOT-SAMSON equipment not be used again by this task group while aboard ship. Off-line encryption, utilizing CSP 3000 equipment, is considered much more stable and efficient and, with a properly trained cryptoboard, just as rapid a system.

#### CIPHONY (AFSAY 806 AND 808)

##### Conclusion:

The AFSAY 806 equipment was considered unacceptable because of its poor voice quality. The AFSAY 808, however, proved to be a definite success. This circuit was used to provide a secure voice net between the USS ESTES and Eniwetok and Enyu Islands and was especially valuable for passing of classified shot information during those periods when CJTF-7 was not on board the USS ESTES. This net was also used by scientific personnel, enabling them to conveniently and securely discuss information pertinent to the shots.

##### Recommendation:

It is recommended that the AFSAY 808 be installed on the task group flagship in future operations of this nature.

#### GENERAL

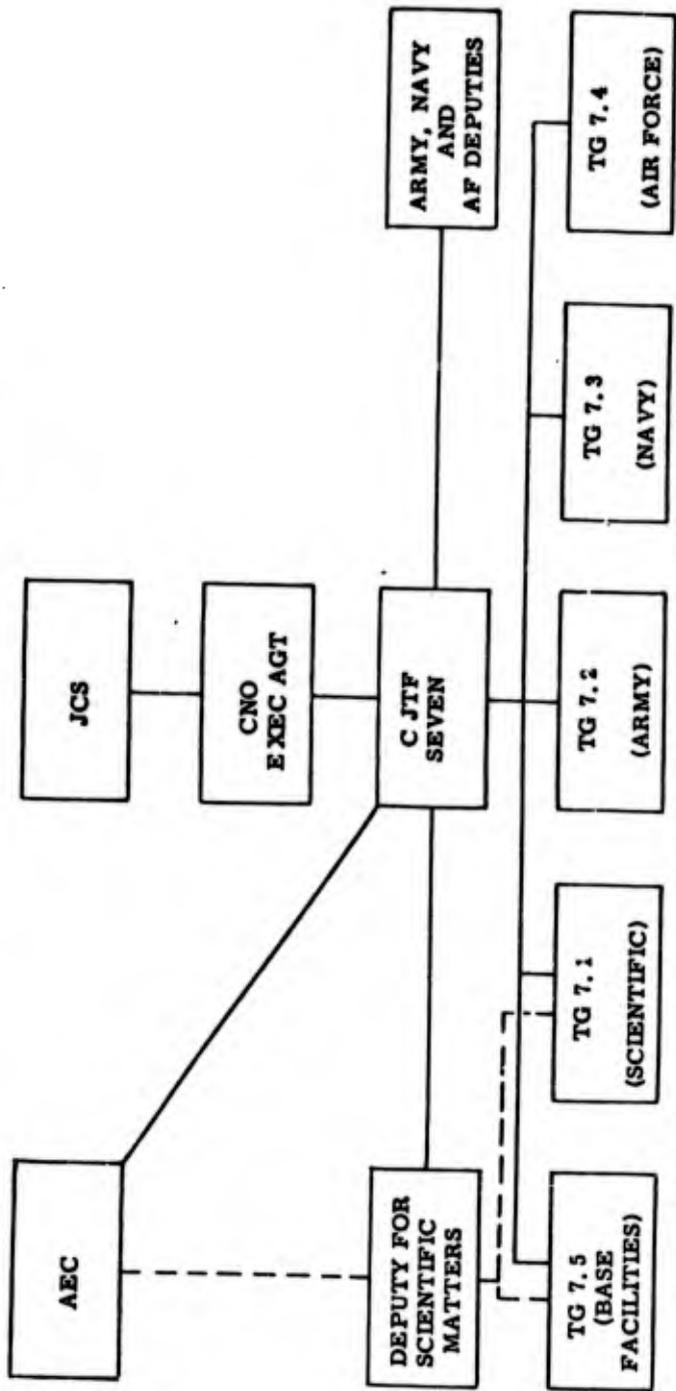
##### Conclusion:

It is considered that much experience was gained and that many valuable lessons were learned.

## ORGANIZATION AND COMMAND RELATIONSHIP

The organization and command relationship of Commander Task Group 7.3 with the Joint Chiefs of Staff, the Atomic Energy Commission, the Chief of Naval Operations, Commander Joint Task Force SEVEN, and the other task groups of Joint Task Force SEVEN, the organization of the staff of Commander Task Group 7.3 and the organization of Task Group 7.3 are depicted in Charts 1, 2, and 3.

ORGANIZATION OF JTF SEVEN FOR REDWING

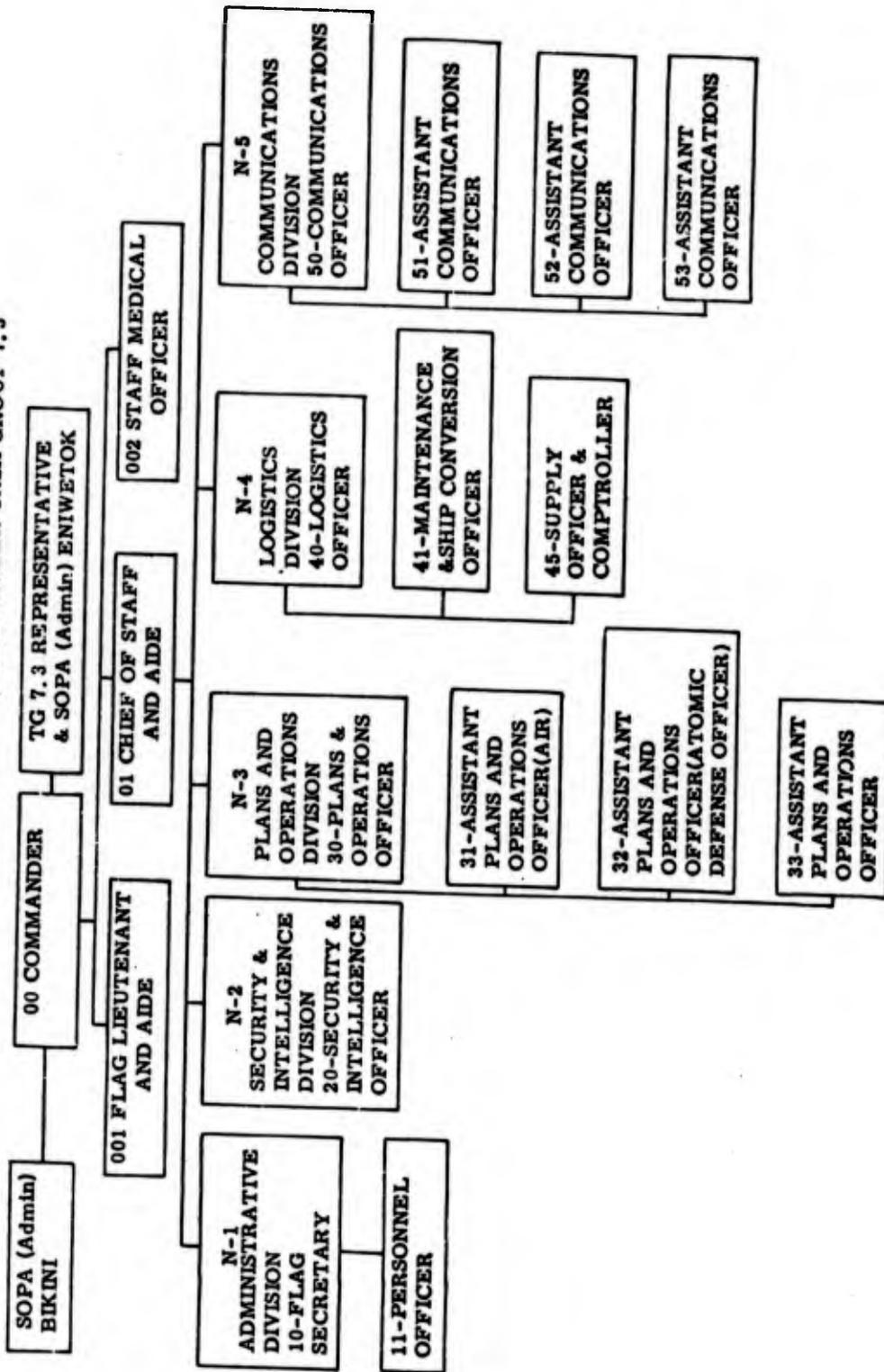


OPERATIONAL CONTROL  
 SCIENTIFIC SUPERVISION

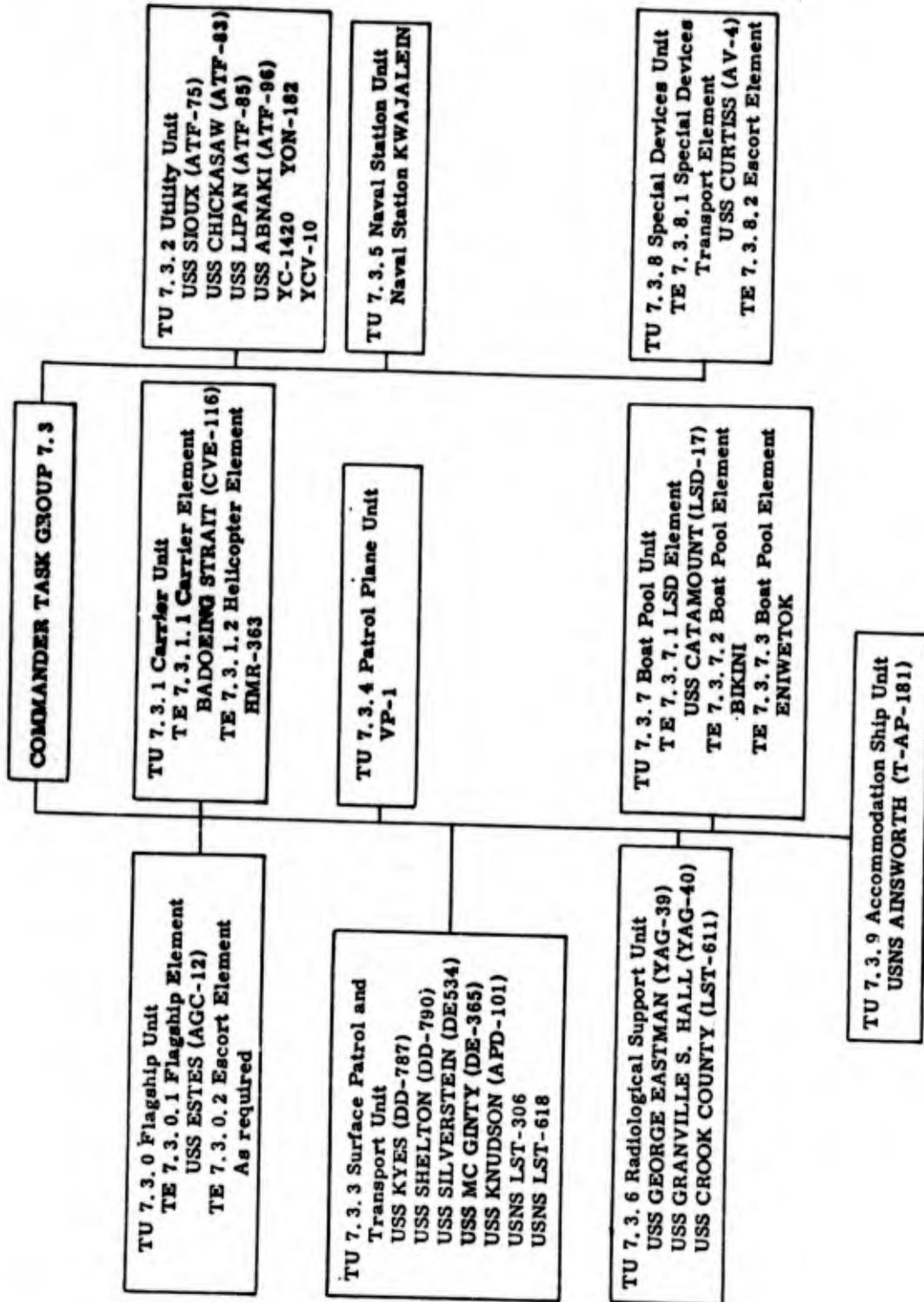
CJTF SEVEN, task group commanders, and key staff personnel will be located as follows: DURING

	BIKINI SHOTS	AT OTHER TIMES
CJTF SEVEN	AGC	PARRY ISLAND
CTG 7.1	AV	PARRY ISLAND
CTG 7.2	ENIWETOK IS.	ENIWETOK IS.
CTG 7.3	AGC	AGC
CTG 7.4	AGC	ENIWETOK IS.
CTG 7.5	T-AP	PARRY ISLAND

ORGANIZATION OF STAFF, COMMANDER TASK GROUP 7, 3



**ORGANIZATION OF TASK GROUP 7.3**



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## SECTION 1

### ADMINISTRATION AND PERSONNEL

#### 1.1 GENERAL

The administration of Task Group 7.3 during Operation REDWING proved satisfactory. Problems and difficulties in administration and personnel encountered stemmed from requirements not envisaged until they developed early in the operational phase.

The personnel performance of all Task Group 7.3 ships and units participating in the operation is considered to have been uniformly outstanding. Discipline was exceptionally good and morale of the highest order. The delivering of mail from the United States and Hawaii was excellent. Stabilization of personnel was effective and extremely small personnel losses were occasioned by emergency leave and hospitalization. The avoidance of personnel casualties is gratifying, the most serious of which was a lacerated ear from a boat accident and a leg bite by a shark. There were no deaths of Navy task group personnel in the Pacific Proving Ground during Operation REDWING.

#### 1.2 INTERIM STAFF

The nucleus of Task Group 7.3 staff personnel was totally inadequate during the interim period following Operation CASTLE.

The Navy task group build-up phase, which started on 1 September 1955 and ended late in November 1955, should have commenced at least three months earlier since it was required that the operational phase of Task Group 7.3 begin on 16 January 1956 with the deployment of its first units to the Pacific Proving Ground.

Many important decisions, concerning Navy participation in the operation and pertaining to essential planning coordination with other task groups, are made early in the interim period. Experienced naval personnel should be available at this time to participate in the discussions leading up to these basic decisions.

### 1.2.1 CONCLUSION

The lack of an adequate number of experienced personnel combined with the late commencement date of the build-up phase adversely affected the essential close liaison with Fleet and Type Commanders whose ships and aircraft not only participated in Operation REDWING but, almost without exception, were required to undergo various alterations prior to such participation.

### 1.2.2 RECOMMENDATION

That the strength of the interim Task Group 7.3 staff be approximately half its operational strength, to provide experience and continuity, and that these personnel should be selected from staff members who participated in the preceding operation.

### 1.3 SHIPS AND UNITS - PREOPERATIONAL

During the planning phase a medical officer was requested for assignment on board the USS CATAMOUNT (LSD-17) to provide the services of a general practitioner for the ship and the Task Group 7.3 Boat Pool, operating therefrom. This brought the number of medical officers under Task Group 7.3 up to a total of six.

In this regard a request was also granted for the assignment of a qualified surgeon as the regular relief of the Doctor on board the USS BADOENG STRAIT (CVE-116). This ship had the best surgical facilities in the task group, and also, superior helicopter landing and take-off area for emergencies. Three ships had dental officers on board during Operation REDWING.

It was determined that five of the assigned ships had chaplains and these were of Protestant denomination. In response to requests of Commander Task Group 7.3 two chaplains of the Catholic faith were ordered, one served on board the USS BADOENG STRAIT (CVE-116) and the other on board the Flagship, USS ESTES (AGC-12).

The Commandant of the Marine Corps approved a request for an additional marine officer to be assigned to the Marine Detachment, USS CURTISS (AV-4), as an officer was required in the conduct of additional security missions of

marine guards. This action restored the marine officers on board to three as the allowance had earlier been reduced to two officers.

Commander Military Sea Transportation Service, Pacific Area, assigned two officers qualified in class three crypto to the Military Department of the USNS FRED C. AINSWORTH (T-AP-181) for the operation.

#### 1.3.1 CONCLUSION

That adequate additional personnel to augment regularly assigned medical officers, chaplains, marine officers and MSTS cryptographic officers were assigned in sufficient time to meet the special needs of Navy forces assigned for Operation REDWING.

#### 1.3.2 RECOMMENDATION

That, in future operations of this nature, special officer requirements be determined during the planning phase.

#### 1.4 OPERATIONAL STAFF

The regular staff of Commander Task Group 7.3 was confronted with a large amount of special on-site operational planning and liaison to meet the requirements of the "two atoll shot capability" permitting dual test series of detonations at both Eniwetok and Bikini. This required that the staff remain on board the flagship to provide the necessary mobility for functioning at either atoll.

The workload for SOPA(Admin) Bikini (CO, USS BADOENG STRAIT) and SOPA (Admin) Eniwetok (COMDESRON THREE) was much greater than anticipated due to the necessity of insuring logistical support of all kinds, close liaison in general matters, the best possible recreational facilities and mail service, and port director services. The Commanding Officer, USS BADOENG STRAIT (CVE-115) also operated the Armed Forces Television Station from his ship, provided regular aircraft carrier support for 15 helicopters and performed services as auxiliary tanker. Temporary additional duty for periods of one month or more with SOPA(Admin) Bikini was offered to personnel by Commander Task Group 7.3 through the Bureau of Naval Personnel and major pacific commands to alleviate the SOPA(Admin) Bikini workload on ship's officers of

the carrier. A total of 7 officers received orders for this participation in Operation REDWING beginning 20 May 1956. These officers served on a rotational basis, two at a time, with the exception of only one during the last shot.

#### 1.4.1 CONCLUSION

That the regular operational staff was planned and organized to function in an operation similar to CASTLE and not in sufficient strength to completely meet the needs of Operation REDWING.

#### 1.4.2 RECOMMENDATION

That the operational staff of Commander Task Group 7.3 be planned to provide a staff large enough for atomic tests of this scope where both atolls are utilized.

#### 1.5 SHIPS AND UNITS - OPERATIONAL

The ships and units assigned from the operating forces to participate in Operation REDWING under the operational control of Commander Task Group 7.3 were manned at their normal fleet percentages augmented by personnel to perform additional duties required by the operation.

Communications and electronics ratings (RM, TE, ET, EM) were the most critical in the afloat forces. Deck and engineering personnel were at a bare minimum and requirements for furnishing large radiological decontamination parties, building and maintaining recreation areas and handling stores placed a heavy burden on the ships, often at a sacrifice in upkeep. Storekeeper personnel worked many long hours each day of the week to prepare ships for deployment and during provisioning and handling of special cargos in the Pacific Proving Ground.

Steward personnel was generally adequate. Prior to departure for the operation, Type Commanders were informed as to additional personnel estimated to be embarked as regular passengers and during pre-shot evacuations.

#### 1.5.1 CONCLUSION

That normal fleet manning percentages do not provide adequate personnel to meet with the demands of operations in the Pacific Proving Ground

of the duration and magnitude of Operation REDWING. This is aggravated by hot humid weather, working and living confined to ships, limited recreation and boredom; all of which greatly decrease human efficiency.

#### 1.5.2 RECOMMENDATION

That ships and units participating in atomic test series in the future be manned at 100 percent of actual allowance.

#### 1.6 EMERGENCY LEAVE AND HOSPITALIZATION

During the operation phase there were 62 individuals granted emergency leave from the Pacific Proving Ground and 40 medical cases requiring evacuation for hospitalization. The total Navy task group personnel primarily engaged in Operation REDWING was 4,688. This does not include Commander Service Force, U.S. Pacific Fleet ships giving logistical support to the task group in the Pacific Proving Ground or the personnel attached to the U.S. Naval Station, Kwajalein.

Personnel returning to the Continental United States for emergency leave were aided at every step in their journey by personnel of each task group and were given excellent treatment and help to speed them on their way.

##### 1.6.1 CONCLUSION

Personnel losses due to emergency leave and hospitalization were very low resulting in 1.3 percent for emergency leave and .9 percent for hospitalization and did not seriously hamper the operation.

##### 1.6.2 RECOMMENDATION

That in future operations similar consideration again be given to the expeditious handling of personnel movements of this type.

#### 1.7 PERSONNEL STABILIZATION

Stabilization of enlisted personnel during the period 1 February to 1 September 1955 was directed by the Chief of Naval Personnel on 21 November 1956.

The operational phase of Operation REDWING began with the deployment of USS CATAMOUNT (LSD-17) and the Task Group 7.3 Boat Pool from San Diego, California on 16 January 1956. All the remaining ships and units followed during February, March and April. The stabilization date of 1 February 1956

proved to be too close to the commencement of the operation. Personnel were transferred from assigned ships and units mostly due to insufficient obligated service and other transfers occurred because of physical or security dis-qualification.

Stabilization is basically for two purposes; one, to provide personnel for operating efficiently, and; two, to insure over-all security clearance requirements are met for participation in atomic tests. The first purpose of stabilization was only partially achieved as replacement personnel were almost always of lower rating with much less Navy experience and professional competency than those lost and the short time they were on board after re-  
porting did not permit adequate training prior to deployment. As series of atomic tests have progressed a smaller percentage of highly classified security clearances have been required and during Operation REDWING a great number of confidential clearances were acceptable for Navy participation.

#### 1.7.1 CONCLUSION

Stabilization should have begun earlier, especially as almost all the Navy ships and units were assigned as of 19 August 1956.

#### 1.7.2 RECOMMENDATION

That personnel be stabilized at least three months prior to the operational phase of future operations of this nature.

#### 1.8 DISCIPLINE

The vast majority of Navy ships and units reported a marked decrease in disciplinary cases and problems and the few remaining ships reported no significant change in the number of discipline cases arose during Operation REDWING.

#### 1.8.1 CONCLUSION

That discipline cases and problems can be expected to be less during operations due to the retention of only good security risks and the restrictive nature of the Pacific Proving Ground that permits almost no unsupervised activity of Navy personnel.

### 1.8.2 RECOMMENDATION

That, should future personnel security requirements be more relaxed than in previous tests, known troublemakers and offenders be disqualified so as to continue the elimination of individuals poorly adjusted socially.

### 1.9 U.S. MAIL AND GUARD MAIL

The delivery of U.S. Mail to the Pacific Proving Ground and its prompt handling and distribution was the subject of planning conferences between task force and task group staff officers and representatives of the Postal Section, Office of the Chief of Naval Operations. As a result of these conferences, a visit to Washington, D.C., of the Army officer ordered as Officer-in-Charge of the Pacific Proving Ground postal facilities during Operation REDWING and visits of a Task Group 7.3 staff representative to the Postal Concentration Center, and Fleet Post Office, San Francisco, California, arrangements were made to implement the plans for the movement of Navy mail. Briefly, these plans were that Navy mail of all classes originating in Continental U.S. would be worked and bagged at San Francisco, California and air-lifted from Travis Air Force Base to the Pacific Proving Ground where distribution to the appropriate atoll APO would take place. Mail of the other task groups was to be entered into the military lift upon arrival at Hawaii, this also included Navy mail originating in the Pacific outside the Continental U.S., and resulted in some routing of Navy mail via Kwajalein with no appreciable delay or attendant difficulty. Further liaison was effected at Pearl Harbor upon arrival of the Flagship, USS ESTES (AGC-12) through discussions between representatives of the staff of CTG 7.3 and Commander Service Force, U.S. Pacific Fleet. Within the Pacific Proving Ground Army Post Offices serving afloat units were located at Eniwetok Island, Eniwetok Atoll (APO 187) and at Enyu Island, Bikini Atoll (APO 436). APO 187 situated near the Eniwetok Air Strip acted as the terminal for incoming and outgoing mail to and from the Pacific Proving Ground. This APO was responsible for distribution of Navy mail in accordance with ship movement information furnished by Task Group 7.3. Mail routed to Bikini

Atoll was air-lifted by inter-atoll air-lift service furnished daily by Task Group 7.4.

The distribution of U.S. Mail to ships at Eniwetok Atoll was expeditiously and efficiently effected through boat pool delivery setup by the Commander Task Group 7.3 Representative whose offices were located on Parry Island, Eniwetok Atoll. This was accomplished by dispatching Task Group 7.3 Boat Pool, Eniwetok Detachment, boats as soon as incoming U.S. Mail could be obtained from APO 187. Outgoing mail was picked up by the boats during these trips and taken to the APO.

At Bikini Atoll ships sent mail clerks to APO 436 at Enyu Island for pick up of incoming and delivery of outgoing mail. The building in which the APO was located provided space for postal facilities for Holmes and Narver personnel. The APO and Holmes and Narver Post Office was separated by a solid partition. This was a very poor arrangement because the area in which the APO was located was in a limited access compound and required secret badged personnel for entry. In addition, the building was remote from the boat pier and this presented a problem of transportation for mail clerks to and from the APO. Although Holmes and Narver bus service was available delays were common and there was no shelter provided from the frequent tropical rains while waiting at the landing for either a bus to the APO or a boat back to the ship.

The APO 187 at Eniwetok and the APO 436 at Bikini were furnished two Navy enlisted men each to augment assigned Army personnel. These men rendered invaluable service in that Navy interests were alertly watched by them and the handling of mail benefited greatly through their Navy background and experience.

Mail from the Continental U.S. generally averaged 6 days from the post mark date until delivery on ships at Bikini Atoll. The shortest transit time was 4 days and delays were experienced in a few cases up to 21 days.

Authority was requested and received from the Chief of Naval Operations in January 1956 to include in the FPO/APO mail service the Scrips Institution

of Oceanography ship M/V HORIZON, assigned to participate in scientific programs of Operation REDWING, while under the operational control of Commander Task Group 7.3.

The operation of Navy Guard Mail Centers at Eniwetok and Bikini Atolls was a function of the SOPA(Admin) at each Atoll. The Guard Mail Center at Eniwetok was maintained in the SOPA(Admin) office on Parry Island and distribution was normally made by including guard mail in the mail trips of the Task Group 7.3 Boat Pool Eniwetok Detachment. The Guard Mail Center at Bikini Atoll was maintained on board the USS BADOENG STRAIT (CVE-116).

An inter-island system within the Pacific Proving Ground for dispatching mail was administered on Enyu and Parry Islands by Commander Task Group 7.5 and on Eniwetok by Commander Task Group 7.2.

Correspondence of a routine nature and not concerned directly with the operation was transmitted to addressees in the Pacific Proving Ground through a combination of the three guard mail systems when necessary.

Correspondence originated by Commander Task Group 7.3 of a priority nature was hand-delivered to addressees by special courier in order to insure timely delivery.

Delivery of important guard mail to Kwajalein Island for Patrol Squadron ONE and the U.S. Naval Station, Kwajalein was a problem due to infrequent trips by aircraft and very few surface ship movements between Kwajalein and the Pacific Proving Ground. The maintenance of constant contact with the Eniwetok Air Strip was necessary to utilize itinerant airplanes destined for Kwajalein to meet these guard mail requirements.

#### 1.9.1 CONCLUSIONS

1. That the planning for mail handling for Operation REDWING was sound as evidenced by the excellent service obtained.
2. That the local delivery of mail by the Task Group 7.3 Boat Pool, Eniwetok Detachment was outstanding.
3. That the physical location of APO 436 in a limited access area on Enyu Island, Bikini Atoll was detrimental to prompt pickup and delivery

of mail by ship's mail clerks.

4. That the assignment of Navy personnel in Army postal facilities was of direct benefit to Task Group 7.3 ships and units.

#### 1.9.2 RECOMMENDATIONS

1. That delivery and pickup of mail from afloat units at the Pacific Proving Ground atolls by a boat service be employed in future operations of this kind.

2. That, where at all possible, postal facilities serving afloat units be located near piers or other areas of easy access by boats.

3. That the utilization of a mobile U.S. Navy Postal Unit for Navy ships and units at Bikini Atoll be considered in planning for the next series of atomic tests in the Pacific Proving Ground to provide trained Navy personnel to handle the task group mail and a postal facility capable of operating on board ship in the event the use of shore-based postal facilities are denied afloat units due to radiological contamination or natural disaster.

#### 1.10 RECREATION

Planning for Task Group 7.3 recreation in the Pacific Proving Ground for Operation REDWING commenced with the submission of Commander Joint Task Force SEVEN letter J4/600.1 of 20 June 1955. The proposals of this letter included rehabilitation of Building 1, Eniwetok, and the establishment of beach shelters at Enyu. The recreation facilities proposed for Enyu Island were to have a maximum capacity of 300 personnel at one time and included joint Navy-Holmes and Narver use of existing Holmes and Narver athletic facilities at limited times.

After a visit to the Pacific Proving Ground in October, Commander Task Group 7.3 submitted a revised request for Navy recreation facilities. This request dated 10 November 1955, doubled the capacity of the Enyu Island facilities and requested separate athletic facilities for Navy use. The establishment of a Navy recreation facility with a capacity of 250 at Japtan Island, in lieu of renovation of Building 1, Eniwetok, was also requested. The revision of planned facilities was considered necessary to:

1. Provide more frequent liberty for Navy personnel. The original capacity at Enyu Island would have allowed an individual one liberty in approximately 15 days since the greater part of the 6,000 man Navy task group were expected to be at Bikini most of the time.

2. Badging and security problems would be eased for Navy personnel, the majority of whom possess a confidential clearance only.

3. The availability of the Japtan site would help alleviate expected overcrowding on Eniwetok.

Approval of these proposals was not effected until mid-January and funding for construction was accomplished by CJTF-7. It was necessary to eliminate electrical provisions contained in the plans to keep the cost of construction within the limit of the funds available.

Completion of Camp Blandy, as the Enyu facility was named, was scheduled for 15 March 1956. Camp Parsons, the Japtan facility, was to be completed by 1 April 1956. Construction was not completed at either camp on these dates due to the higher priority of other construction required of Holmes and Narver at this late stage of the build-up phase.

As it was considered necessary that these camps be completed at the earliest possible date, Navy personnel were used to finish the job. Camp Parsons was able to be formally opened on 10 April 1956 only because of the hard work of Navy personnel, particularly from USS ESTES (AGC-12) and Construction Battalion personnel from Kwajalein. These personnel also extended the size of the shelters so that their designed capacity could be realized without overcrowding.

Camp Blandy was formally opened on 13 April although some phases of construction were not complete on that date. It was only through the tremendous efforts of USS BADOENG STRAIT (CVE-116) personnel, augmented by working parties from ships present at Bikini, that the camp was able to commence service by this date. When finally completed the facility could accommodate over 600 personnel with ease. Unfortunately, the swimming beach at Camp Blandy has a coral shelf at the water's edge and swimming was not as

popular there as at Camp Parsons.

The on-site operation of these camps was accomplished by Navy personnel. Holmes and Narver, in accordance with previous agreements, supplied beverages, ice, water at Camp Blandy, and other services such as insect control spraying.

Boating problems at Bikini, which were a serious problem on previous operations, were minimized by shifting ship anchorages in closer to Enyu Island so that ships rode more in the lee of the island.

#### 1.10.1 CONCLUSIONS

1. Original planning as to size and location of Navy recreation facilities required revision.
2. The physical facilities of the camps, constructed by Holmes and Narver and expanded and improved by Navy labor, were adequate to handle the designed numbers of personnel.
3. The completion of the camps was delayed by the lateness of the approval of the construction coupled with the fact that, when finally approved, contractor personnel were occupied fully with construction of higher priority jobs.
4. The swimming beach at Bikini was of marginal use later in the operation due to the presence of sharks, stingrays and squid.
5. The continuity of operation of the camps was jeopardized by routine failures of the portable electrical generating equipment and the necessity on large shots at Bikini of evacuating this equipment.
6. It was found beneficial to morale to have ships rotate between Eniwetok and Bikini Atolls between shots. Occasional trips to Kwajalein for morale and upkeep purposes were authorized when the shot schedule and other duties permitted.
7. The installation of the television station in BADOENG STRAIT was beneficial both for entertainment and educational purposes. Electronic interference in some ships such as ESTES tended to discourage television viewing.

#### 1.10.2 RECOMMENDATIONS

1. That Commander Task Group 7.3 Staff be maintained in a status where

is is able to do adequate interim planning. This will obviate late changes in plans and consequent delays in completion of construction.

2. That Camps Parsons and Blandy be maintained between operations for future Navy use.
3. That electrical power be supplied from fixed generators of the Army at Japtain and Holmes and Narver at Enyu Island rather than from portable generators.
4. That fresh water be piped from Holmes and Narver existing lines at Enyu to Camp Blandy.
5. That the Navy continue to operate the recreation camps, with beverages, etc., being supplied by Holmes and Narver during operations.
6. That each camp be equipped with ice making facilities.
7. That a small boat pier be constructed at Camp Blandy so that other than ramped boats may be better and more safely utilized.
8. That television programs again be provided <sup>W</sup>with shore based at Enyu or from afloat.
9. The designated swimming areas be enclosed with appropriate wire mesh to keep sharks, stingrays, etc., out of the swimming areas.
10. That future boat pool allowances include adequate personnel and craft for liberty parties at both Japtan and Enyu.
11. That anchorages at Bikini be move closer to Enyu by relocating cables which at present pass through the middle of the best anchorage area.
12. That early and adequate planning information on what type of recreation facilities are available in the Pacific Proving Ground be promulgated to ships participating in future operations so they may provide for their own requirements of athletic gear, hobby shop materials, swimming gear, television sets, etc.

## SECTION 2

### SECURITY AND INTELLIGENCE

#### 2.1 GENERAL

There were no known attempts by foreign powers to obtain intelligence concerning this operation by the use of submarines, surface craft or airplanes operating in the general vicinity of the test atolls. Neither were there any indications or evidence of attempted sabotage, espionage or personnel penetrations into this task group by unfriendly agents. One suspected submarine contact was investigated which was evaluated as no submarine (see remarks under Operations - Hostile Alert Plan).

#### 2.2 SECURITY INDOCTRINATION AND TRAINING

The general policy concerning security pertinent to Operation REDWING was set forth in Commander Joint Task Force SEVEN (CJTF-7) Standing Operating Procedure 205-1 dated 3 November 1955 and 205-2 dated 3 November 1955 which were promulgated by Task Group 7.3 Instruction 05510.11A dated 12 December 1955, captioned "Security Training and Indoctrination for Operation REDWING." This information was disseminated to all ships and units scheduled for assignment to the task group and supporting elements. The general policy was similar to that required for Operation CASTLE.

Commanding officers and unit commanders were requested to designate their Executive Officer and as many additional officers as deemed necessary for the purpose of security training of the crew and maintaining security throughout the operation.

As of 1 January 1956, a security log was to be maintained to record in chronological order all security measures and precautions taken by each ship or unit of Task Group 7.3.

All personnel who through past participation in atomic tests or long association with classified operations were required to read the security examination contained in CJTF-7 SOP 205-2 and execute a "Certificate of Compliance." Personnel who had not participated in previous atomic tests or whose past duties have been of such nature that they received little if

any indoctrination in security matters were required to take an open book security examination. Personnel were encouraged to bring matters of security to the attention of their security officers, where not understood. The signed certificates and completed examinations are to be retained on board each ship and unit until 1 August 1957. Due to the instability of personnel prior to departure for the Pacific Proving Ground (PPG), in general, these examinations were given enroute.

Commander Task Group 7.3 letter serial 169 dated 12 December 1955, forwarded security posters to all vessels with the request that they be rotated at two week intervals in order to keep personnel aware of their security responsibilities.

Security film was received from CJTF-7 at intervals during the operation and furnished to the Commanding Officer, USS ESTES (AGC-12), for distribution to ships of Task Group 7.3 in accordance with Commander Task Group 7.3 Notice 5500 dated 25 April 1956.

Commanding officers and unit commanders allotted considerable ship's time for holding of security lectures and inserted security reminders in the ship's "Plan of the Day."

#### 2.2.1 CONCLUSION

Security indoctrination and training was carried out very effectively throughout the task group with excellent results.

#### 2.2.2 RECOMMENDATIONS

1. All personnel should be stabilized at least three months prior to the departure of the ship or unit for the Pacific Proving Ground.

2. Vessels assigned by Commander Service Force, U.S. Pacific Fleet for logistical support of the task group during the operation should be made known as soon as possible in order to participate in the necessary indoctrination and training of crews in an orderly fashion.

#### 2.3 PERSONNEL CLEARANCES

Clearance requirements of personnel for Operation REDWING were contained in Commander Task Group 7.3 (CTG 7.3) Instruction 05521.1A dated 12 December

1955.

Repeated conferences were held with representatives of the Office of Naval Intelligence in order to expedite clearance information on all personnel. In view of the large number of requests for National Agency Checks the completion date was moved from 15 March to 1 April 1956.

As there were approximately 50 Filipino Nationals serving in the task force a conference was held with Commander in Chief, Pacific (CINCPAC) with the result that CINCPAC confidential despatch 160608Z of November 1955 was issued. This despatch stated that Filipino Nationals serving Navy enlistments were not to be considered aliens for the purpose of entry into the Pacific Proving Ground. In view of this information Office of Naval Intelligence offered no objection to running background investigations on these personnel in order to issue confidential personnel security clearances. Due to the type of investigation necessary the completion date for all background investigations was set at 1 May 1956.

Although CINCPAC informed all major commands to comply with the requirements of his letter serial 020 of 1 April 1952 prior to the transfer of personnel to ships and units of Task Group 7.3 and that personnel so transferred should have been issued a confidential security clearance, this was not accomplished. Many personnel were received at Kwajalein and Eniwetok whose orders and records contained no remarks concerning necessary clearance. In order to expedite the onward movement of such personnel CJTF-7 requested their liaison officer at Kwajalein to issue the necessary clearance in accordance with CINCPAC letter serial 020 and that commanding officers or unit commanders would initiate the necessary requests for personnel security clearance after arrival on board their duty station.

Commander Service Force, U.S. Pacific Fleet was notified that all personnel attached to logistical support vessels would be required to be cleared for access to confidential information.

### 2.3.1 CONCLUSION

That the general requirements of confidential for crews of ships and units attached to Task Group 7.3 and support elements is satisfactory. Certain personnel should be granted a higher degree of clearance where necessary.

### 2.3.2 RECOMMENDATIONS

1. In order to facilitate clearance of all personnel stabilization should be set at least three months prior to ships departure for the PPG and ships should be at their requested operating strength at that time.

2. That all Filipino personnel records be checked and personnel questioned as to their nationality. Where it is found that naturalization has been effected that a notation to this effect be placed in the man's service record.

3. That all forms to be submitted for clearance of personnel be closely checked in order to avoid return for additional data or correction and resubmission. Assistance to be furnished to personnel in filling in the forms where necessary.

### 2.4 CONTRABAND

During security indoctrination and training periods all personnel were advised as to articles considered contraband in accordance with CINCPAC letter serial 020 of 1 April 1952, subject; "Eniwetok Atoll; Security Instructions."

Prior to entry into the PPG commanding officers and unit commanders afforded all personnel an opportunity to turn in contraband items to security officers for safekeeping. Thereafter, security inspections were held at infrequent intervals of personnel lockers and the ship. Only one security violation was reported as the result of these searches within the task force which was due to the person involved not hearing the word passed for the turning in of the articles and later becoming frightened and attempting to hide a camera in a compartment.

Personnel transferred from the fleet via air transportation to ships and units of the task force in the PPG presented the greatest problem. Ten cameras and one speed key were found in luggage at the inspection station at

Eniwetok Island. These articles were removed by Military Police of Task Group 7.2 and turned over to the Security Officer, Task Group 7.3, who in turn delivered them to the security officer of the ship or unit to which the man was attached for safekeeping while in the PPG. Film found in cameras at the inspection station was forwarded to the Atomic Energy Commission film processing laboratory and then to the classification office. Unclassified film was returned via task force security officers to the individual concerned.

All mail clerks were advised at the time of first boarding by the Security Officer, Task Group 7.3 that film in their possession should be returned to the sender as it was not permissible to be mailed in the PPG and that the ship or unit security officer should be notified of such return of film in order that he might pick it up for safekeeping.

All foreign merchandise purchased while in the PPG of a contraband nature such as cameras and firearms was paid for by the purchaser and immediately turned in to the ship or unit security officer for safekeeping.

Due to the large amount of contraband material held for safekeeping by security officers and the limited amount of storage space available permission was obtained from CJTF-7 postal officer for personnel to send by registered mail contraband material that was being held in safekeeping for them.

#### 2.4.1 CONCLUSIONS

1. The search and control of contraband items within the task group was adequate and well carried out.

2. That all ships of the Pacific Fleet did not hold or were not aware of the existence of CINCPAC letter serial 020 dated 1 April 1952 and its requirements.

#### 2.4.2 RECOMMENDATIONS

1. That CINCPAC letter serial 020 dated 1 April 1952 be revised to meet current requirements and be reissued to all ships and stations at the time of reissue.

2. That CJTF-7 Liaison Officers advise personnel traveling by air to

the forward area of the contraband restrictions. This would afford them the opportunity to mail such items home at that time while outside the PPG.

## 2.5 PHOTOGRAPHY

All personal cameras were considered contraband and held by security officers of ships and units for safekeeping while in the PPG.

Due to the nature of the tests no official photography was required of Task Group 7.3 in connection therewith.

Official photographers on board the USS ESTES (AGC-12) and USS BADOENG STRAIT (CVE-116) were properly badged.

Authority to take unofficial photographs of personnel for sale to individuals was not received until almost the end of the operation.

### 2.5.1 CONCLUSION

No photographs were taken by personnel of Task Group 7.3 of any part of the test programs or sites.

### 2.5.2 RECOMMENDATION

That instructions regarding unofficial photography be issued prior to the commencement of the next operation to permit implementation of an effective program.

## 2.6 INSPECTIONS

The Staff Security Officer visited a number of ships and units of the task group in the West Coast Area during the interim period for the purpose of discussing security preparedness. Full coverage of ships was not possible due to deployment schedules and the location of some vessels beyond the continental limits.

The Staff Security Officer was in the PPG prior to arrival of the task group and boarded each ship or unit upon its arrival as a member of a boarding party. At this time he held security briefings and offered his assistance in any way in which he could be of help. Recurrent inspections were made during the operation as ships and units were available.

Due to the operation being conducted at both Eniwetok and Bikini Atolls, it was necessary for the Staff Security Officer to fly back and forth in

order to make the necessary boarding calls, and security inquiries on ships and units of Task Group 7.3.

Due to the Task Group 7.3 Security Officer being mostly at Bikini Atoll on board the USS ESTES (AGC-12) it was necessary to designate a member of the staff of SOPA(Admin) Eniwetok to act in the capacity of Task Group Security Officer for the Eniwetok Area and act in liaison with other task group security officers and personnel of the Badge and Pass Office, Parry Island.

#### 2.6.1 CONCLUSIONS

1. It is believed that these visits to ships and units both during the interim and operational period are extremely helpful and beneficial for planning and security as a whole.

2. The movement of the security officer to the PPG prior to the arrival of the task group and acting as a member of the boarding party was beneficial in the clearance of ship and passengers and expedited their movement.

#### 2.6.2 RECOMMENDATION

That two staff officers be assigned security duties on the Staff of CTG 7.3 in order that one may be located at each atoll both during the interim period just prior to arrival of the task group and during the operation. This would afford immediate availability of a staff security officer to ships and units at either atoll and close liaison with Headquarters, JTF-7, other task group security officers, and AEC security badge and pass personnel.

#### 2.7 SECURITY VIOLATIONS

There were no known security violations within Task Group 7.3 or its supporting elements.

Prior to departure from the PPG all personnel were given a security briefing and required to sign a departure statement. These statements were forwarded to the Task Group 7.3 Security Officer where they will be retained for a period of one year.

Personnel were warned that they could say nothing about the operation other than that permitted concerning the first two detonations. They would

neither confirm nor deny any other reports in regard to the operation.

#### 2.7.1 CONCLUSION

That the security instructions issued and the time given to security instruction of personnel and other media used to make everyone security conscience was very well carried out by all ships and units throughout the operation.

#### 2.7.2 RECOMMENDATION

Security indoctrination and training should be started at the Training Station and be made a part of a serviceman's training throughout his career. Security is not something to be taught for a single operation but involves our every-day work and our country as a whole.

#### 2.8 IDENTIFICATION SYSTEM

In addition to the security requirements of all personnel for entry to the PPG access to various islands of the atolls was controlled by the means of badging of individuals.

Commander Joint Task Force SEVEN SOP 205-6 dated 31 January 1956 was promulgated by Commander Task Group 7.3 Instruction 05512.1 dated 9 February 1956, subject; "REDWING Badge Identification System" and CJTF-7 SOP 205-7 dated 23 March 1956 was promulgated by Commander Task Group 7.3 Instruction 05512.2 dated 3 May 1956, subject; "Identification System at the Pacific Proving Ground; outline of."

In accordance with these instructions personnel badging was kept to a minimum within the task group. This was largely due to the Navy recreation areas established at Japtan Island, Eniwetok Atoll and Enyu Island, Bikini Atoll not requiring badges for entry.

Military Sea Transportation Service vessels in or arriving in the area did not have personnel clearance data on board and had not submitted requests for personnel badging. It was necessary to request this information from their headquarters, and assist in the submission of the necessary forms.

Although the task group security officer arrived in the PPG in advance of the task group, badges were not available upon their arrival due to being

improperly mailed.

As a majority of the ships and units of Task Group 7.3 do not have photographic equipment on board for taking identification pictures and are required to carry out operating schedules up to the time of departure for the PPG they were hampered in submitting their requests for badging, such forms were not received until after arrival in the PPG where photographs were taken locally.

Parry Island at Eniwetok Atoll and Enyu Island at Bikini Atoll presented the greatest problem in badging as personnel were required to have a minimum clearance of secret for access.

On Enyu Island, Bikini Atoll was located the Army Post Office, air strip and AEC Badge and Pass Office, all in a limited access area. Plane crews coming direct from Kwajalein to Enyu were required to be cleared for secret. Ships coming into the PPG direct to Bikini Atoll encountered difficulty in landing mail clerks until they were badged. Personnel were required to obtain a limited area permit to land, proceed direct to the Badge and Pass Office and obtain a temporary badge, issued for one week period while awaiting their permanent badge.

Working parties required at Enyu Island and decontamination parties landed at Parry Island for RadSafe Operations were required to be issued escort badges and be under constant escort while ashore. These badges were issued and collected daily as the personnel had only confidential security clearances and did not qualify for a permanent badge. Escort badges were issued to baseball teams playing at both Parry and Enyu Islands.

#### 2.8.1 CONCLUSION

That the badge requirements for the operation were in excess of the actual need and these requirements should be reviewed prior to the next operation.

#### 2.8.2 RECOMMENDATIONS

1. That the instructions for badging and the system to be used during the next operation be issued far enough in advance to allow for the

procurement of badge pictures, and submission of requests in time that the badges would be available upon arrival in the PPG.

2. That the security badge request form be revised to be more explanatory in its wording.

3. That Parry and Enyu Islands be declared open areas except for the administrative compounds and restricted areas contained therein. These to be enclosed as at present by barbed wire fence and guarded by Military Police and have perimeter lighting. Commanding officers should continue to be responsible for the control of personnel to visit these islands in the performance of duty as during Operation REDWING.

## 2.9 PUBLIC INFORMATION

All public information press releases were issued or authorized only by CJTF-7.

Prior to departure of ships and units of Task Group 7.3 ship movements, except for the USS CURTIS (AV-4) and her escort vessels, were unclassified. In addition CJTF-7 issued a press release which allowed personnel to state that they were part of Joint Task Force SEVEN and that they were going to the Pacific Proving Ground to participate in atomic tests in the early spring.

After the nomination of members from all phases of news media to view the first two detonations a public release was issued naming the persons selected. Due to the wide coverage given these detonations task force personnel were later allowed and encouraged to write home what they saw without revealing technical information.

Throughout the operation personnel received news clippings from friends and relations and articles appeared in the ship's press news quoting Japanese sources as stating a detonation was believed to have taken place in the PPG on a certain date and time. Security training did not permit personnel to deny or confirm these statements in their correspondence.

### 2.9.1 CONCLUSION

Public information releases were held to minimum throughout the operation, and in keeping with the security indoctrination and training received,

personnel of TG 7.3 did not reveal any information used in home-town newspapers.

#### 2.9.2 RECOMMENDATIONS

1. That for morale purposes during the operation more information of an unclassified nature be made available to task group personnel.
2. That personnel be informed of the expected length of the operation prior to departure from the United States in order to make necessary arrangements for their absence, particularly for their dependents.

## SECTION 3

### PLANS AND OPERATIONS

#### 3.1 PLANNING AND TRAINING

The planning for Operation REDWING by the staff of Commander Task Group 7.3 began in October 1955. Before this date, many of the important decisions regarding special installations on ships and, indeed, the designation of the ships for the operation had already been made. This circumstance presented to the operations section a twofold problem - that of producing an operation plan, and that of correlating as best could be done the completion of installation of special equipment in ships and of training personnel as needed to operate this equipment. A great deal of the second problem was resolved with the reporting of a Material and Maintenance Officer, with consequent shift of responsibility for installations to the logistic section.

The work on Operation Plan No. 1-56 was commenced on 26 October 1955 and the plan itself was published on 24 January 1956. This plan became Operation Order No. 1-56 upon arrival of CTG 7.3 in the forward area and, with relatively minor changes remained effective throughout the operation.

Concurrently with work on the operation plan, much thought and time were expended on working out details of the deployment plan for forces assigned. Late assignment of two destroyers from DesRon THREE and substitution of USS MC GINTY (DE-365) and USS SILVERSTEIN (DE-534) for USS WALTON (DE-361) and USS FOSS (DE-59) added to the complications of the effort.

As an aid to individual ship and unit planning, copies of the final reports submitted after Operation CASTLE were forwarded to each ship of similar type assigned to Operation REDWING. Estimates of the efficacy of this procedure from forces assigned ranged from noncommittal to enthusiastic. It was felt that this information would be of some value to all, since it was the only source available upon which to base estimates of requirements for Operation REDWING. Admittedly, the scope of REDWING, both in duration of

deployment and in number of shots, was far greater than any previous operation.

As an aid to type commanders, who retained operational control of their ships until deployment, copies of all correspondence relative to special installations and training incident thereto were compiled and sent out. In many cases, this involved copying correspondence emanating directly from Task Group 7.1 to ships concerned, and digesting pertinent extracts from other letters. Unfortunately, some of these letters arrived too late to be of significant help to the type commanders. This correspondence was supplemented by a few visits of staff personnel to ships and the type commanders. The pressure of work at headquarters precluded making these visits with anything like the regularity desired by either the forces concerned or the Task Group 7.3 staff.

An important part of preliminary planning was the preparation and procurement of adequate charts. The Hydrographic Office produced chart HO 6009-OA, a Bikini Operating Area chart which was of great value in deploying ships for shots. After much delay, a locally reproduced chart of the Enyu anchorage was made and distributed. Initiation of these requirements should have been done much earlier, and closer liaison with the Task Group 7.5 contractors could have been effected to make the Enyu anchorage more suitable.

Training was in the main left to individual ships. For ABCD training, the staff RadlSafe Officer made several trips to the West Coast and ships based there. The RadlSafe Annex to Operation Plan No. 1-56 was issued in advance of the main plan. Also, extra personnel were procured to conduct an active on-board training program in the forward area. This was well received by all participants. Special training was arranged for the TV technicians and the ET's connected with radiac maintenance. Individual ship's efforts produced much valuable training in connection with the LOKI project, the telemetering equipment on USS KNUDSON (APD-101), and the fall-out and radiation navigation equipment on USS SILVERSTEIN (DE-534) and

USS MC GINTY.

In summation, time simply did not exist in the amount available to do all parts of the job in the most desirable manner. Perforce, a choice had to be made as to which aspect took precedence. It is believed that the over-all success of the operation indicates that the correct aspects were emphasized and concentrated upon.

### 3.1.1 CONCLUSIONS

1. That the Operations Section of the staff of Task Group 7.3 was formed far too late on the build-up phase of the operation.
2. That effective liaison with various projects and with Task Group 7.1 in particular was not established early enough.
3. That adequate time was not available for thorough briefing of type commanders and individual ships and units prior to the operational phase of Operation REDWING.
4. That, subject to the remarks in 3 above, the type commanders rendered excellent support to Task Group 7.3.
5. That preparation and procurement of navigational charts was not initiated soon enough because of staff limitations in personnel.

### 3.1.2 RECOMMENDATIONS

1. That the operations section of Task Group 7.3 remain manned and active during the planning phase as well as the build-up phase of the next operation.
2. That every effort be made to make early assignment of naval forces for next operation.
3. That early and effective liaison be established with Task Group 7.1 and that all requests for naval participation as well as special installations in naval ships be discussed and cleared by both Task Group 7.1 and Task Group 7.3 before submission to CJTF-7.
4. That liaison with type commanders be started when the concept of the next operation is known and intensified as forces are assigned.
5. That liaison with participating naval activities not type commanders,

such as NRDL, ONR, NOL, and NOTS, be initiated and maintained.

6. That early agreement be entered into with the Hydrographic Office and the Commandant of the Coast Guard in the matter of procuring adequate charts and navigational aids both at Bikini and Eniwetok.

### 3.2 MOVEMENT TO FORWARD AREA AND ASSEMBLY OF SUBORDINATE UNITS

Movement to the forward area was necessarily conducted over a period of time. The principal considerations were (1) need for ships and units at a certain time (2) completion of special project installations by shipyards and contractors, (3) requirement for rehearsals by all units prior to first shot and (4) security of certain critical materials in transit.

These factors were weighed and checked and by December 1955, Commander Task Group 7.3 serial 0061 of 16 December was sent to CINCPACFLT via CJTF-7. The schedule proposed in this letter with modifications embodied in Commander Task Group 7.3 serial 0091 of 27 February was followed as the basic deployment plan. After approval by CINCPACFLT, type commanders issued necessary sailing orders with ships shifting to Commander Task Group 7.3 operational control on arrival in the Pacific Proving Ground.

First on station was USS CATAMOUNT (LSD-17). She arrived early in February with the dual purpose of establishing the Task Group 7.3 Boat Pool at Bikini and providing surface lift for the contractors of Task Group 7.5 who were preparing weather stations on outlying atolls. A drastic and unforeseen slippage in construction completion for these sites made it necessary for CATAMOUNT to remain assigned to this off-atoll support duty until mid-April. However, this did not seriously hamper operations of the boat pool. Certain routine drydocking of boats was delayed, and some maintenance was curtailed. Under the energetic direction of the Officer in Charge, the boat pool operated to full capacity from the start.

Second major unit on station was USS BADOENG STRAIT (CVE-116). Arriving embarked was the final element of HMR-363. The first echelon of which had arrived via other transportation, which was needed to make the helicopter airlift fully operational. Details of the difficulties encountered while

setting up the helicopter inter-atoll airlift are covered in another section. (See Helicopter Airlift).

Between 31 March and 25 April all other units arrived on station and Task Group 7.3 was complete. Commander Task Group 7.3 arrived on station 31 March in USS ESTES (AGC-12) and assumed command of units present.

Probably the greatest unforeseen operation was the return of HRS-1 helicopters to Pearl Harbor and the lift out of HRS-3 replacements. This was accomplished by the emergency diversion of USS PINE ISLAND (AV-12) by COMAIRPAC and fast turn-around of USS CURTISS (AV-4) upon arrival with critical material. The smoothness and efficiency of this transfer was due in great measure to the efforts of the Commanding Officers, USS PINE ISLAND and USS CURTISS and to the whole-hearted cooperation of COMPAIRPAC and CG, AIRFMFPAC.

Soon after arrival on station, it became apparent that the operation as planned would not require exercise of operational control of the ships and units assigned through the task unit commanders listed in Operation Plan No. 1-56. The exceptions to this general rule were HMR-363 which continued to function under the Commanding Officer, USS BADOENG STRAIT as a task element, YAG-39, YAG-40, and LST-611 which operated as a unit throughout the test series, and the T-LST's which operated under Commander Task Group 7.3 Representative Eniwetok. Operational control of all other ships and units remained directly with Commander Task Group 7.3 with local harbor control delegated to the SOPA(Admin) Eniwetok and Bikini.

### 3.2.1 CONCLUSIONS

1. Operations would have been easier had the Commanding Officer, USS CATAMOUNT (LSD-17) been given authority to approve his itinerary during the period when he was the only operational ship of Task Group 7.3 in the forward area.

2. The task group organization proved its flexibility when confronted with a completely unforeseen requirement - total renewal of aircraft for HMR-363.

3. The division of the group into ten task units as originally planned was too minute, and in practice the task unit commanders were not required to function as such with a few exceptions. This concentration of control did not hinder the operation but enhanced its efficient conclusion.

4. Movement of ships and units piecemeal from the West Coast and Pearl Harbor did not hamper successful organization of the task group. Task Group 7.3 was ready for full operation when required.

### 3.2.2 RECOMMENDATIONS

1. When a ship is deployed well in advance of the main group, the commanding officer of that ship should be designated as the representative of Commander Task Group 7.3 with authority to approve his own itinerary and to deal with other task group representatives with only final decisions on major disagreements reserved to Commander Task Group 7.3. This same procedure should be followed when a ship is left behind after the main body returns to home ports.

2. Subject to remarks in other sections regarding liaison with type commanders and assigned ships, deployment of ships or units individually to the forward area is completely satisfactory and can be followed in subsequent operations.

3. Requirements, both operational and scientific, should be closely scrutinized in delineating the task organization with the idea of reducing the number of task units rigidly assigned. This would leave spare task unit designations available for assignment to special purpose groups.

### 3.3 MOVEMENT OF DEVICES AND COMPONENTS

The movement of devices and components of interest to Task Group 7.3 divided itself into two parts - (1) the movement of the major portion of devices from Port Chicago to the forward area in the USS CURTISS (AV-4) and (2) intra-atoll movement of devices and components in the USS CATAMOUNT (LSD-17). The first portion was planned for upon receipt of the CJTF-7 Movement Directive No. 1-56. This was received first in an advance draft copy. From this advance draft copy was derived Commander Task Group 7.3

Operation Order No. 2-56 which concerned the movement of the USS CURTISS group. These two orders were resolved in a conference held at Naval Supply Center, Oakland, California in February of 1956 and shortly thereafter Operation Order No. 2-56 was issued in smooth form for planning by forces concerned. It was planned to have USS CURTISS proceed direct from Port Chicago to the forward area, escorted as far as a point south of Pearl Harbor by two destroyers of Destroyer Squadron THREE, with this escort augmented at this rendezvous by two destroyer escorts from Escort Squadron ELEVEN. Later, it was determined also that at that rendezvous the group would be augmented by an oiler, the USS MISPILLION. This Operation Order No. 2-56 was carried out as written with no untoward incidents occurring enroute. A full report of the operation is contained in Commander Destroyer Squadron THREE (CTU 7.3.8) letter serial 084 of 13 April 1956 which reports the entire operation.

Inter-atoll movements of devices and components commenced after the CHEROKEE shot with the requirement to move the ZUNI device and a further requirement to move all other shot barges from Eniwetok from where the devices were assembled, to Bikini where the devices were to be moored and later detonated. The basic plan covering these movements was issued as Operation Order No. 3-56. This operation order covered the major broad points and requirements and consisted of an operation order and two annexes, ABLE and BAKER. Annex BAKER covered specific air patrol procedures and remained effective. Annex ABLE changed for each movement and was known as Annex ABLE (ZUNI), Annex ABLE (FLATHEAD), Annex ABLE (DAKOTA), etc. It was found after the first issuing of Annex ABLE that this could be done as well by message as in longer form and commencing with the FLATHEAD move, Annex ABLE was issued in message form to units concerned. The concept of this unit was that USS CATAMOUNT re-entered after any given shot, discharged the boat pool and boat pool personnel, then proceeded to Eniwetok unescorted. At Eniwetok the Commanding Officer, USS CATAMOUNT became Commander Task Unit 7.3.7. The destroyer present at Eniwetok shifted operational control to Commander Task Unit 7.3.7 and stoodby to get underway on signal. A patrol aircraft from

VP-1 reported on site off Eniwetok approximately one hour prior to sortie of the task unit and when the task unit was in all respects ready for sea with device and barge loaded, the unit sortied, with CATAMOUNT screened by the destroyer and the aircraft throughout the transit between Eniwetok and Bikini. The P2V aircraft was controlled by the destroyer. The aircraft was relieved on station in sufficient time to insure that its capabilities were never over-extended. Upon arrival at Bikini the destroyer conducted a barrier patrol at the entrance while the aircraft screened also off the entrance until CATAMOUNT had safely entered and proceeded to the unloading site. When CATAMOUNT proceeded to the unloading site, anchored, and commenced flooding down, the P2V was released to proceed to Kwajalein, the destroyer entered Bikini and anchored.

Of interest was the transfer of responsibility in both the move of CURTISS from the West Coast and the inter-atoll moves of CATAMOUNT. In each case the commanding officer of the ship was designated as the representative of Commander Task Group 7.3 and CJTF-7. He signed as responsible officer for the critical material embarked from the representative of Task Group 7.1 and Task Group 7.5 or the Atomic Energy Commission, as appropriate. Custody and responsibility for the special components embarked then remained with the commanding officer until such time as the ship arrived at her destination, at which point this custody was reassumed by a representative of Commander Task Group 7.5. Accountability for these items at all times remained with the Atomic Energy Commission either directly or through a representative of Task Group 7.5. This division of responsibilities was not accute, was understood by all and in practice worked very well since the entire responsibility for safekeeping of the material was vested in the commanding officer with all accountability remaining with Task Group 7.5.

### 3.3.1 CONCLUSION

This method of transporting critical material from the continental United States to the forward area and between atolls works very well. No change was necessary in the original operation plan in either case, and it was

proved when the HURON device failed that the Operation Plan No. 3-56, simply by issuing a new Annex ABLE, completely covered the return of a failed device.

### 3.3.2 RECOMMENDATION

That a similar practice be followed for future operations when broad transport of critical material is required and that operation orders similar to Operation Order No. 2-56 and Operation Order No. 3-56, issued by Commander Task Group 7.3, be issued for future operations.

### 3.4 ON SITE OPERATIONS AND REHEARSALS

Only one full scale rehearsal was held. This was for the CHEROKEE event. This rehearsal was deemed necessary because it was the first rehearsal or operation held involving all units of the task group in combination with units from Task Group 7.4 and units of Task Group 7.1 and Task Group 7.5. This rehearsal was conducted in late April with USS MT MCKINLEY participating. USS MT MCKINLEY had been assigned as press ship and arrived on station in time to participate in the rehearsal and return to Kwajalein to pick up the press observers for the CHEROKEE event. Communication rehearsals were held with only token participation from units of Task Group 7.3. In only rare cases was a unit required to sortie for a rehearsal after the original full scale rehearsal for CHEROKEE. These rehearsals all were performed with lack of incident. They were considered most successful, lessons were of great value in later phases of the operation in stationing ships with special requirements such as USS BADOENG STRAIT and USS KNUDSON. Communication rehearsals continued to be held at frequent intervals throughout the operation.

On-site operations consisted principally of sortie for shots. These sorties, due to certain delays in themselves became rehearsals. However, as the operations progressed, the task group became extremely efficient in sortie at anytime of the day or night, and in fact completed sortie for the NAVAJO shot some forty-seven minutes prior to the time that the clocks closed on the device itself. This was considered to be about the latest that the sortie could be successfully accomplished. General plan for sortie was that

ships which were partially manned, such as those of Task Unit 7.3.6 (Radio-logical Support Unit), left first, partly because they had the longest distance to go to station and partly to afford them the convenience of a day-light departure. The second ships to leave were the ATF's which took tows to sea. The reason for their earlier departure was again to afford them the opportunity to sortie during daylight. Following these craft the des-troyers and destroyer escorts would sortie followed in order by the major ships. As a matter of policy, USS ESTES sortied last so that as she entered the channel the lagoon could be reported clear, and it would be certain that no one had been left ashore while waiting for another ship.

Other on-site operations consisted of fueling the major units at sea. This was scheduled between shot ready dates. Each major unit, including USNS FRED C. AINSWORTH, was fueled at least once at sea during this time. Usual procedure was to sortie oiler and receiving ship to meet at a designated rendezvous, fuel alongside, and both ships return to port. Smaller ships were fueled at sea only as an emergency measure or for training. Usual practice was to top off destroyers and destroyer escorts on entry when an oiler was available in the area.

When time permitted units were ordered to go to sea to conduct routine training operations. The ATF's were afforded an opportunity to fire their 40 mm battery as was USS ESTES. Unfortunately no target services were avail-able to allow destroyers or destroyer escorts, the APD, or the USS CURTISS to complete any firing. However, seamanship drills were conducted, damage control drills were conducted, engineering drills were conducted, and it is felt that in the natural course of following through the operation all ships received excellent training in ABC drilling.

Certain other operations were carried out locally, principally at Eniwetok. These consisted of short cruises aboard destroyers for selected members of the Joint Task Force Staff and of the personnel of Task Group 7.1, Task Group 7.2, Task Group 7.4, and Task Group 7.5. While these operations were of no direct value to the over-all conduct of Operation REDWING, it is

felt that they were more than worthwhile in indoctrinating personnel of the other services and of the civilian task groups into the problems of Navy life and the over-all aspects of naval participation in the Operation.

#### 3.4.1 CONCLUSIONS

1. It is felt that no hard and fast rule can be laid down for operation of the various ships and units in a major operation such as REDWING.

2. Every opportunity must be taken as it occurs to conduct strictly naval shipboard training and to complete requirements of the type commanders in the competitive and training cycle.

#### 3.4.2 RECOMMENDATION

That the operations staff of Task Group 7.3 on future operations remain alert to the requirement to schedule naval training at any available time and that full employment of this available time be made.

#### 3.5 SCIENTIFIC SUPPORT

The extent and nature of the scientific support rendered during Operation REDWING by units of Task Group 7.3 is outline in Annex M to CTG 7.3 Operation Order No. 1-56. Comments pertinent to specific support missions performed by Task Group 7.3 are itemized below under the appropriate project number.

##### 3.5.1 PROJECT 1.4 (USAF Geophysics Research Directorate, Boston, Mass.)

The objective of this project was to determine the effects of altitude on blast overpressure in order to ascertain the safe minimum range for delivery aircraft. This project participated only in CHEROKEE shot.

Three van telemeter receiving stations were loaded on the super-deck of the USS CATAMOUNT (LSD-17) and were used in receiving the measurements telemetered from aircraft-dropped cannisters during CHEROKEE shot. This installation was made with no difficulty and the civilian personnel accompanying the equipment obtained satisfactory results.

In assigning shot time positions of ships, it was necessary to position the CATAMOUNT such that there would be no interference with telemetering reception due to the proximity of other ships. It was also necessary to

restrict radio transmissions for a period during and after shot time, which might interfere with the telemetered signals.

3.5.2 PROJECT 1.9 (Scripps Institution of Oceanography, Univ. of Calif.)

This project was concerned with the measurement of the characteristics of water waves, inside the lagoon, caused by the detonation of thermonuclear weapons, [

The observation stations were positioned in the lagoon by LCM-37 which had been fitted with a modified anchoring winch and boom, fathometer and other equipment necessary to moor the floating stations. Civilian project personnel assisted in the operation and no difficulties were encountered.

3.5.3 PROJECT 2.61 (USNRDL, San Francisco, California)

In order to determine the validity of the several models proposed to describe the radioactive cloud resulting from a thermonuclear detonation, special rockets, fired from a special rocket pad launcher on Bikini Island, penetrated the cloud along predetermined paths and telemetered information from which the spatial distribution of activity in the cloud could be ascertained. [

A special telemeter station was installed in the USS KNUDSON (APD-101) which received this rocket-telemetered information. As in the case of the CATAMOUNT, it was necessary to place the KNUDSON in a position, specified by project personnel, which would maximize the probability of good reception conditions and to restrict radio transmissions which could interfere with the telemetered signals.

3.5.4 PROJECT 2.62 (Scripps Institution of Oceanography, Univ. of Calif. and USNRDL, San Francisco, California)

This project, [ was primarily interested in the measurement of the characteristics of the radioactive fall-out occurring as a result of the detonation of thermonuclear weapons as an air burst and as a water surface and a land surface burst.

The USS SILVERSTEIN (DE-534) and the USS MC GINTY (DE-365) were fitted out with special winches and trolling probe counters. Civilian project

personnel operated this equipment on board these ships. Assisted by the M/V HORIZON, these ships were employed in making radiological surveys of the ocean surface and sub-surface radioactivity from D-1 through D/4 days. On D Day, as soon as radioactivity levels permitted, these ships were directed to desired positions by radio by the Program 2 Plot personnel on board the USS ESTES (AGC-12). The movements of these ships, in delineating the ocean water radioactivity, were then controlled from Program 2 Plot which maintained close liaison with the Commander Task Group 7.3 in order that he be informed of the current and prospective movements of these ships.

The measurements of characteristics of the fall-out occurring inside the lagoon was accomplished through instrumentation contained on unmanned stations moored at specific points within the lagoon. Three pontoon rafts were permanently moored along the long axis of the Bikini lagoon in an average water depth of approximately 25 fathoms. Instrumentation on these rafts was contained in a central conical fall-out collection platform and was installed after mooring. Since the rafts were unable to float the weight of chain necessary for mooring without taking on an undesirable list, floatation buoys, five feet in diameter, were used to buoy up the chain, and the rafts were moored directly to the buoys with a lazy preventer to the chain. The two YFNB's, containing instrumented fall-out collection towers, were moored in different positions for each shot as specified by Program 2 personnel. These barges were towed into position by an ATF, positioned by navigational fixes, and were anchored using their own bow anchor and chain. It was found that one anchor per YFNB was sufficient and that the yaw was not such that it interfered with the directional measurement equipment installed. Sample recovery was accomplished by helicopters which could land on the flat roofs of the YFNB's with no difficulty.

Fall-out measurements outside the lagoon were accomplished by positioning instrumented fiberglass skiffs in a predetermined array north of Bikini Atoll. The USS SIOUX (ATF-75) was fitted out with a special hoisting equipment, an after boom, and accomplished the mooring and recovery of the skiffs

under the direction of project personnel. The techniques used for single wire moorings in two thousand fathoms of water will be covered in a separate report published by Scripps Institution of Oceanography. The techniques involved and the utilization of a specially fitted ATF proved highly satisfactory.

#### 3.5.5 PROJECT 2.63 (USNRDL, San Francisco, California)

The task of this project, closely related to that of project 2.62, was to determine the pattern, time of arrival and other characteristics of the radioactive fall-out outside the lagoon. Concurrently, the ships involved in these measurements also were used to study the relative importance of the various radiations accompanying fall-out as applicable to the ship shielding program, and the use of water washdown and strippable coatings as tactical decontamination procedures.

The USS GEORGE EASTMAN (YAG-39), USS GRANVILLE S. HALL (YAG-40), and USS CROOK COUNTY (LST-611), on which special fall-out detection and measurement instruments were installed, were directed to pre-shot stations from which, according to the latest weather information, the fall-out pattern could be tracked most expeditiously. The initial position and subsequent movements of these ships in carrying out their mission, were directed by Program 2 Plot personnel who maintained close liaison with CTG 7.3.

#### 3.5.6 PROJECT 2.64 (USNRDL and New York Operations Office, AEC)

Using P2V aircraft, specially fitted out with detection and measurement instrumentation, this project obtained data from which it may be possible to determine the radiation intensity pattern on a land surface due to the fall-out resulting from the detonation of thermonuclear weapons. The aircraft were controlled from Program 2 Plot by the Task Group 7.3 Air Operations Officer. Close coordination with personnel controlling the manned fall-out stations, i.e., two YAG's and one LST, was necessary in order to obtain simultaneous measurements of the radiation intensity in a given position at the ocean surface and at various altitudes. Since the build-up factor for fall-out occurring over land can be computed, correlation of these measurements

should produce important data not heretofore available.

#### 3.5.7 PROJECT 2.65

This project was concerned with the characteristics of the fall-out particles collected by Projects 2.62 and 2.63, with the determining the isodose contours which result from fall-out due to the detonation of thermonuclear weapons. Task Group 7.3 support of this project consisted of positioning the YC-1420, a barge from which helicopters could operate and specially outfitted as a packaging and transshipping facility for radioactive samples. The YC-1420 was towed to sea by an ATF in the evacuation preceding each shot and was returned to the lagoon and anchored in the Enyu anchorage as soon as the lagoon could be safely reentered.

#### 3.5.8 PROJECTS 2.62, 2.63, and 2.64

Program 2 Plot, consisting of communications and plotting facilities, display arrays and suitable working space, was installed in the Flag Communications space on board the USS ESTES (AGC-12). Specifications for the installation were prepared by Program 2 personnel prior to deployment. Task Group 7.3 communication personnel were used to man the necessary radio circuits. All plotting and controlling functions were accomplished by Program 2 personnel except for the air control function performed by Task Group 7.3 Air Operations Officer. The close proximity of this space to Flag Plot aided the close liaison necessary with CTG 7.3.

#### 3.5.9 PROGRAM 2 (Division of Biology and Medicine, AEC)

By surveying the radioactivity of the ocean water, viscera of fish and other marine life and of core samples of the bottom, both before and after Operation REDWING, this program investigated the effects of such a weapons test program in increasing the radioactivity of the ocean water and marine life and the parameters of diffusion, transport and penetration. The special equipment necessary to conduct these surveys was installed on the participating destroyer escorts in the Eniwetok Lagoon with no difficulty. Civilian program personnel were on board to accomplish all measurements.

### 3.5.10 ALL PROJECTS OF PROGRAM 2 (Hastings Corp., Hampton, Va.)

The objective of this program was to determine the loading and the blast and thermal effects on various types of aircraft in flight due to the detonation of high yield thermonuclear weapons. Very precise knowledge of aircraft positions in space was necessary for the success of this operation and this information was supplied by RAYDIST, a multi-station position determining device. The USS BADOENG STRAIT (CVE-116) served as a floating platform for one RAYDIST station which consisted of three van trailers containing transceiving equipment, two power generator trailers and several antenna arrays. All equipment was located on the forward part of the flight deck and was manned by project personnel. The position of the BADOENG STRAIT in the shot time array of ships was critical and restrictions on the proximity of other ships and on radio transmissions were necessary to avoid interference with operation of the RAYDIST equipment. These difficulties, noted during the rehearsal operations, were resolved after conferring with cognizant program personnel.

### 3.5.11 PROJECT 8.5 (U.S. Naval Bureau of Aeronautics)

The objective of this project was to determine the spectral characteristics of the thermal radiation at high altitudes, due to the detonation of thermonuclear weapons of various yields, by high resolution spectroscopy. Task Group 7.3 support consisted of furnishing one P2V aircraft, which was specially instrumented to obtain the necessary measurements. No difficulties were encountered.

### 3.5.12 GENERAL SUPPORT

#### 3.5.12.1 Upper Wind Measurements

Special rocket launchers were installed on one 5"/38 gun mount of the USS JAMES E. KYES (DD-787) and the USS SHELTON (DD-790). These ships were positioned on weather stations specified by Commander Joint Task Force SEVEN to obtain high altitude wind data in order to augment wind data obtained by fixed weather stations in the Pacific Proving Ground. Soundings were usually taken from D-3 through D Day. The WASP rockets, fired by LOKI mortars, ejected window at predetermined altitudes up to 100,000 feet. The fire control radar

on board these ships was used to track the window targets and obtain the required soundings. This support of existing weather data was highly successful and provided invaluable information for use in the prediction of shot time wind data.

#### 3.5.12.2 Timing and Firing Stations

A specially instrumented timing and firing station was installed in the USS CURTISS (AV-4) to be used in lieu of, or to augment the instrumentation at Station 70 on Enyu Island. No difficulty was encountered in the installation or in its operation.

#### 3.6 HOSTILE ACTION ALERT PLAN

The Hostile Action Alert Plan of Commander Task Group 7.3 was, by nature of the forces assigned, somewhat sketchy. Total security forces available under the optimum circumstances were two destroyers, two destroyer escorts, one APD and the aircraft of VP-1. The normal plan which, perforce, had to be changed to meet shifting commitments was to retain at least one ship capable of ASW work at each atoll. This ship remained on a normal one-hour notice and was thus available to sortie and take up ASW action against any submarine which might be detected in the area. The area was continually patrolled by the aircraft of VP-1, which is basically an ASW squadron. These aircraft proved most alert in picking up vessels in the area and in confirming the information received from OCA's as to vessels which might transit the area. In many cases it was necessary to send off on special missions the ships which normally would have been assigned as guard ships in each lagoon. At each time when a special mission was requested evaluation was made as to the value of the special mission against the value of having a ship available in the lagoon. It is to be especially noted that all of the ships available to the task group as security forces had other commitments to scientific projects - the destroyers had the LOKI rocket and weather installation, the destroyer escort had special installation for investigation of radioactive fall-out in water, and the APD had a special installation to telemeter sampling rockets. Therefore, none of these forces were available on full-time duty

as a security ship and each time a security ship was needed the question arose as to whether or not a scientific project involved could spare the ship. In practice, this Hostile Alert Plan worked well because the demands for special security patrols by ships were very few. On 20 May there was an instance of a suspected submarine off Bikini. This was thoroughly investigated by a destroyer, USS JAMES E. KYES (DD-787), and a destroyer escort, USS SILVERSTEIN (DE-534), and an evaluation of no submarine was made. This investigation and search did not impede the scientific programs embarked in the least.

#### 3.6.1 CONCLUSION

The Hostile Action Alert Plan, as conceived, was satisfactory.

#### 3.6.2 RECOMMENDATIONS

1. That no more extensive Hostile Action Alert Plan be promulgated for future operations unless higher authority determines that security of the task force and task force installations is so paramount that special security forces with no other mission will be assigned.

2. If such determination is made, sufficient security forces be assigned with no other primary mission.

#### 3.7 NATURAL DISASTER DEFENSE

The basic plan for natural disaster defense against such occurrences as typhoons or tidal waves was contained in Operation Plan No. 1-56. Fortunately, no opportunity existed to test the efficiency of the plans embodied in this operation plan. It is believed that with due warning of a typhoon or tidal wave sortie of the units could have been accomplished in the same orderly fashion that it was accomplished for the shots.

#### 3.7.1 CONCLUSION

The procedures as outlined in Operation Order No. 1-56 were sound.

#### 3.8 DISPOSITION OF FORCES

Disposition of forces for each shot was based on two requirements - (1) special project requirements for ship's positions and (2) safety from blast and fall-out of all ships. Before each shot, a consultation with the staff of Task Group 7.1 determined which ships would require special locations

for projects and a safe distance at or beyond which the units of the group would be stationed.

All dispositions at Bikini were based on HO Chart 6009-0A. Ships were given night steaming areas and a shot-time position. Instructions allowed considerable discretion on night steaming with a requirement that ships be in one designated position at shot time.

A separate check list was issued for each event which included as an enclosure the disposition of forces for that event. The dispositions for each of the shots fired at Bikini are given in Figures 1 through 6.

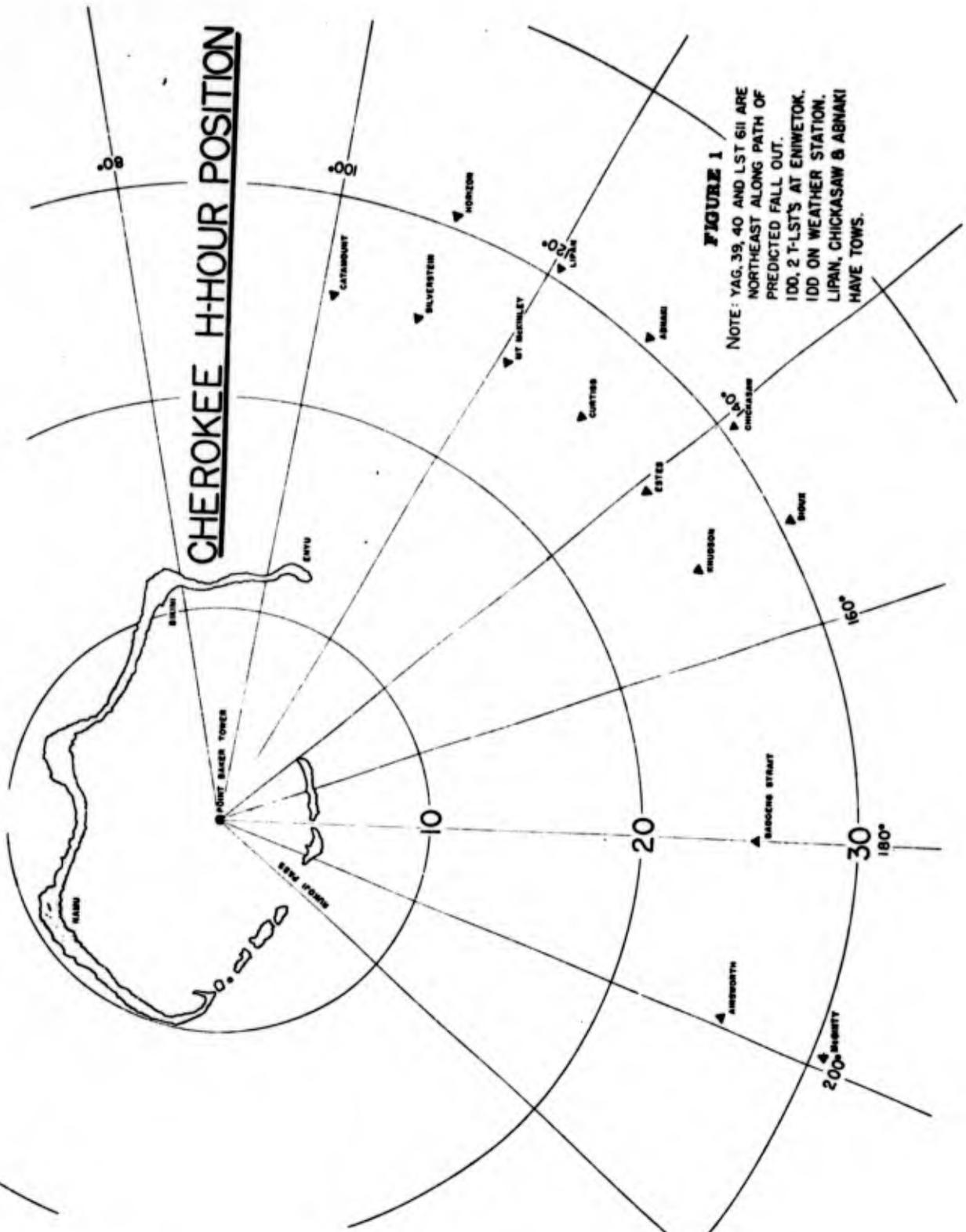
Table 1 is a compilation of the sorties for each shot and aborted shot together with the final shot time.

At Eniwetok sortie was not generally required. For the APACHE shot however, it was deemed necessary to sortie ships. A standard plan was issued for any Eniwetok shot with a standard disposition. Ships present at Eniwetok were assigned these standard spots. This disposition is shown in Figure 7.

#### NOTES

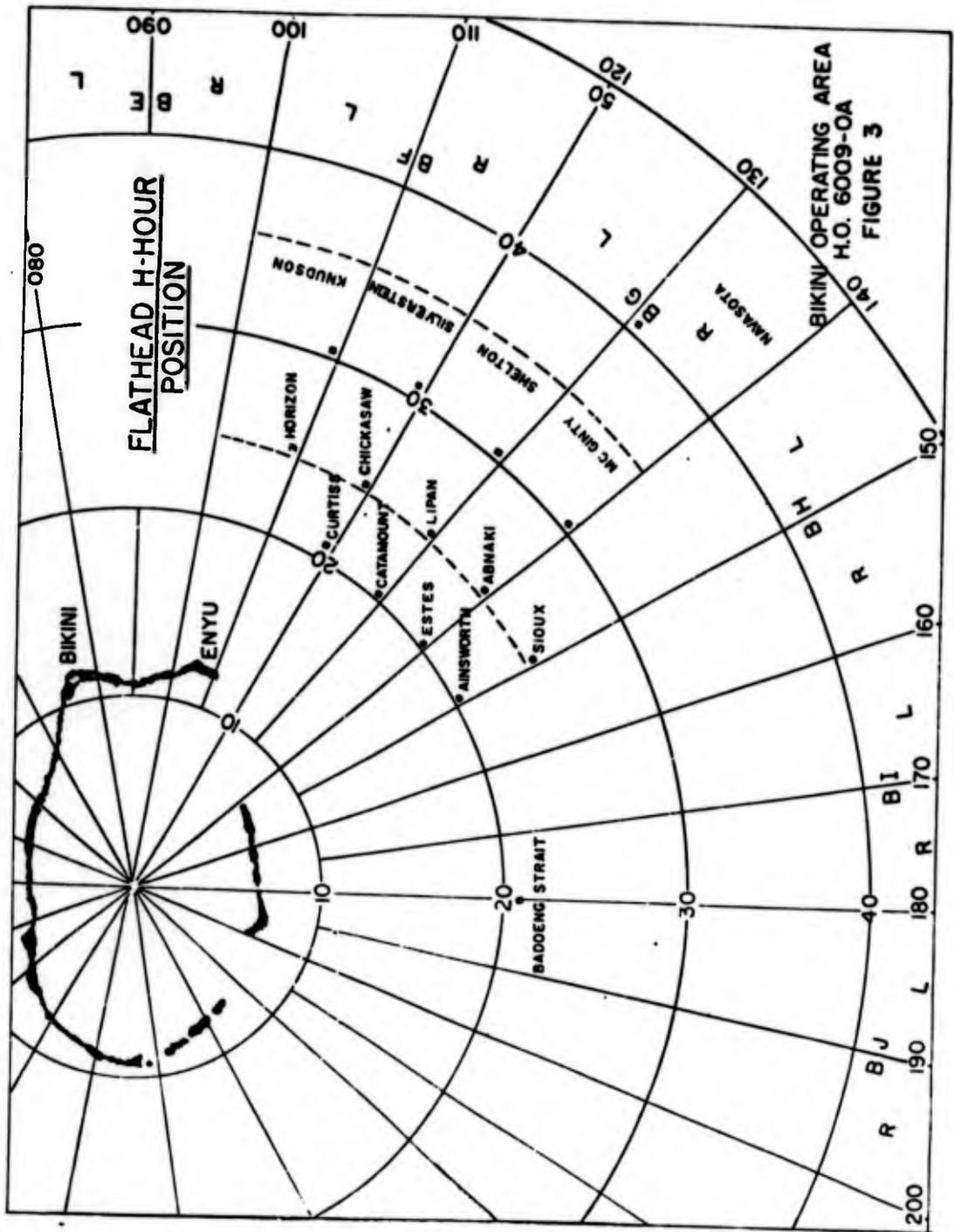
- Figure 1 - CATAMOUNT placed at project request for telemetering.  
KNUDSON placed at project request for telemetering.  
MC GINTY and SILVERSTEIN placed to be in best position to commence project runs after H-Hour.  
ESTES and CURTISS placed for use in communications.  
MT MCKINLEY placed for best view of correspondents and observers.  
SIOUX and HORIZON placed to allow them to help tugs with tows if needed.
- Figure 2 - KNUDSON placed at project request for telemetering.  
BADOENG STRAIT placed at project request for RAYDIST.  
CURTISS placed close to Enyu Island since firing was accomplished from CURTISS.  
MC GINTY and SILVERSTEIN placed to be in good position for water survey.
- Figure 3 - BADOENG STRAIT placed at project request for RAYDIST.
- Figure 4 - BADOENG STRAIT placed at project request for RAYDIST.
- Figure 5 - BADOENG STRAIT placed at project request for RAYDIST.  
KNUDSON placed at project request for telemetering.
- Figure 6 - BADOENG STRAIT placed at project request for RAYDIST.  
KNUDSON placed at project request for telemetering.  
MC GINTY and SILVERSTEIN placed for ease in starting water survey.

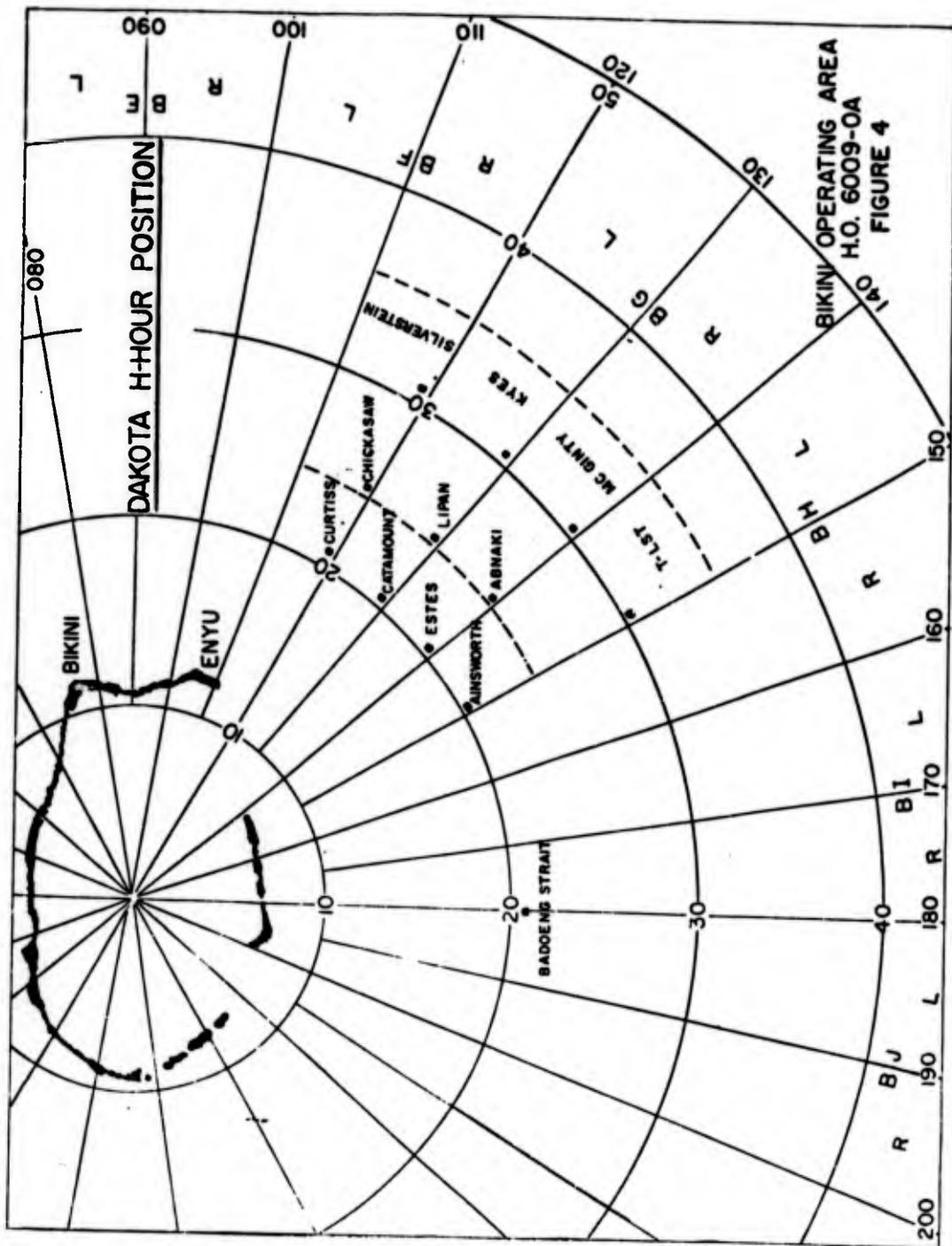
# CHEROKEE H-HOUR POSITION

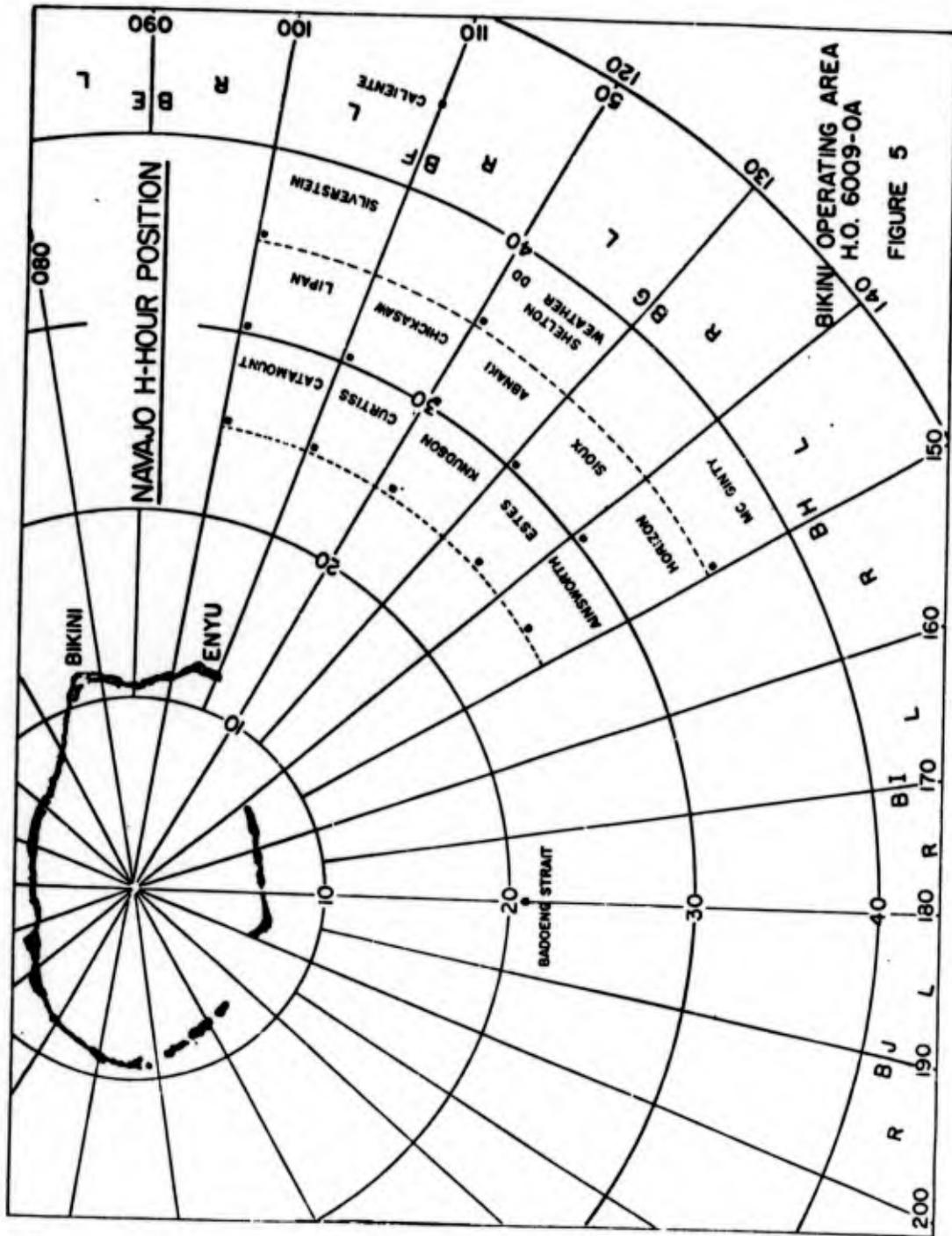


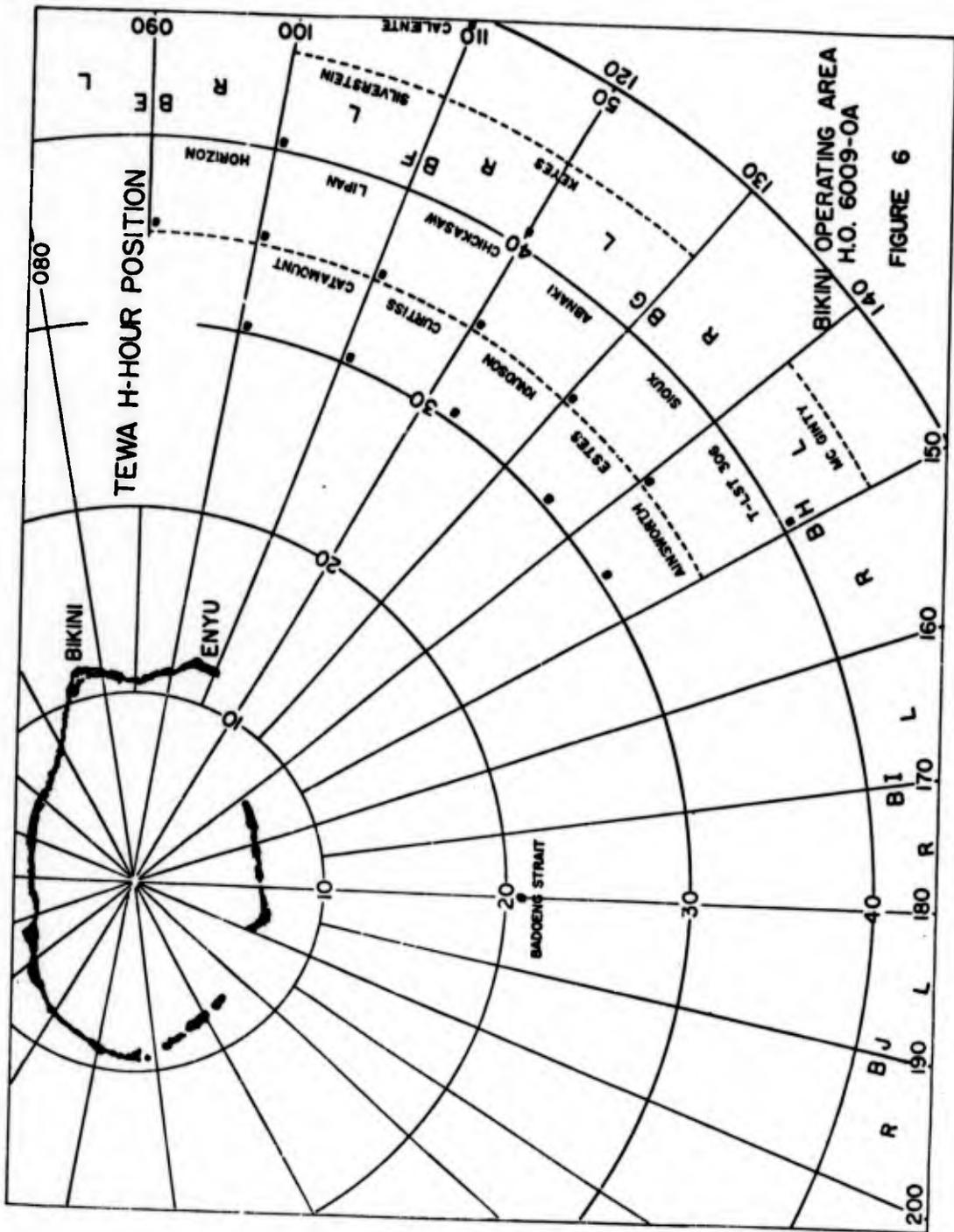
**FIGURE 1**  
 NOTE: YAG, 39, 40 AND LST 611 ARE  
 NORTHEAST ALONG PATH OF  
 PREDICTED FALL OUT.  
 IDD, 2 T-LST'S AT ENIWETOK,  
 IDD ON WEATHER STATION,  
 LIPIN, CHICKASAW & ABNAKI  
 HAVE TOWS.











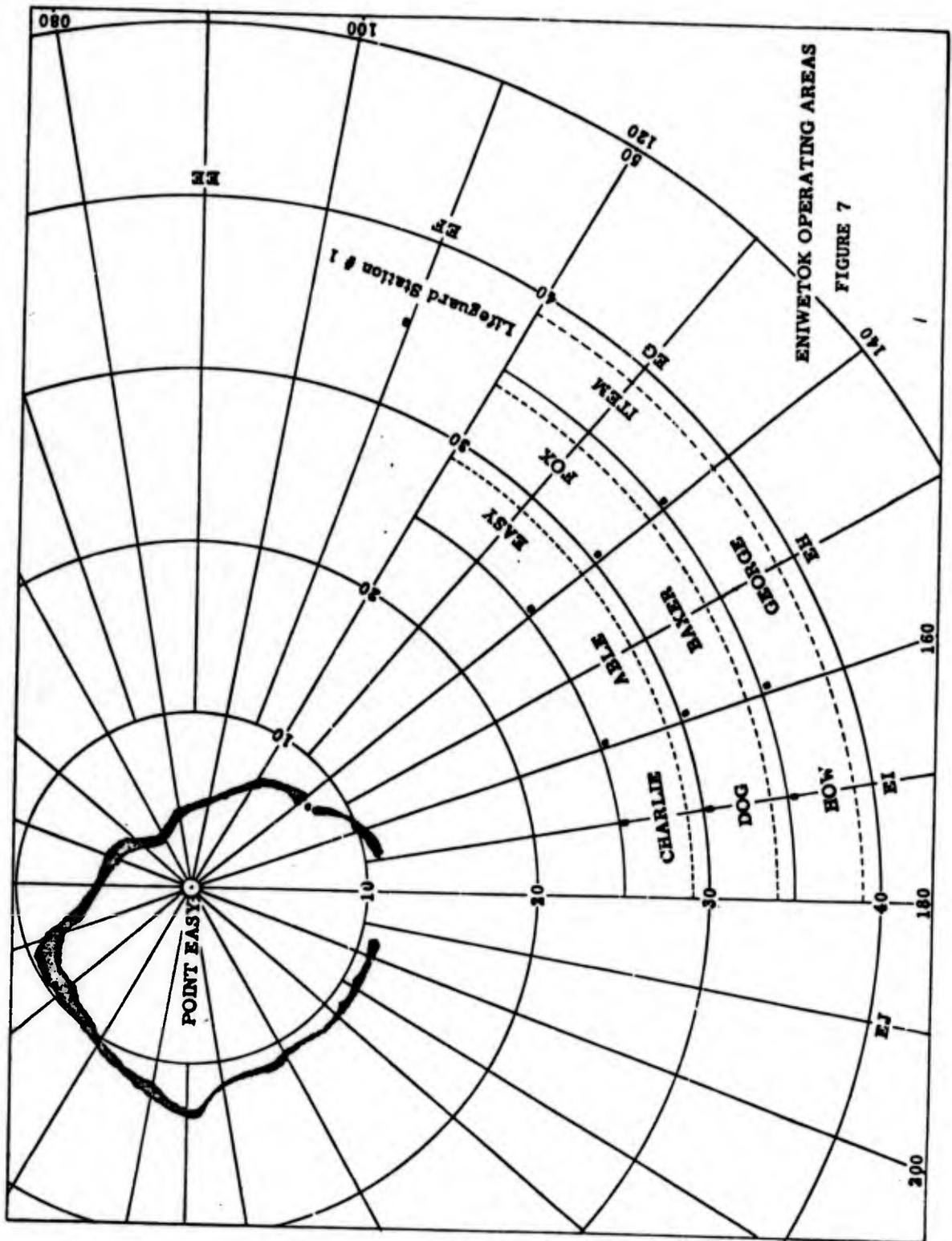


Table 1 - COMPILATION OF BIKINI SORTIES

Shot Number	Shot Name	Ready Date	Sortie Date	Date Fired	Reentry Date	Site
1	CHEROKEE	8 May	10 May 16 May 17 May 20 May	21 May	11 May 17 May 18 May 21 May	Near Namu Island
2	ZUNI	280556M May	27 May	28 May	28 May	Eninman Island Bikini Atoll
Device on Site 23 May						
3	FLATHEAD	090606M	11 Jun	12 Jun	12 Jun	In lagoon near Yurochi Island, Bikini Atoll
Device on Site 11 June						
4	DAKOTA	180606M Jun	17 Jun 21 Jun 25 Jun	26 Jun	18 Jun 22 Jun 26 Jun	In lagoon near Yurochi Island Bikini Atoll
Device on Site 15 June						
5	HURON	020611M Jul	1 Jul		2 Jul	4 July - removed from Shot Site to Site Elmer
Device on Site 29 June						
6	NAVAJO	090551M Jul	8 Jul 9 Jul 10 Jul 11 Jul	11 Jul	8 Jul 9 Jul 10 Jul 11 Jul	In lagoon near Yurochi Island Bikini Atoll
Device on Site 6 July						
7	TEWA	180546M Jul	20 Jul	21 Jul	21 Jul	On reef between Namu and Yurochi Islands, Bikini Atoll
Device on Site 15 July						

### 3.9 SEARCH AND RESCUE

The SAR responsibilities of the operational commander are clearly defined in CINCPAC directives. The Operational Commander, Commander Joint Task Force SEVEN, assigned the over-all responsibility for SAR within the Air Traffic Control Area in the Pacific Proving Ground to Commander Task Group

7.4. Outside the Air Traffic Control Area the well established SAR organization and procedures in existence were used and the nearest facility was the SAR Coordination Center, Naval Station, Kwajalein.

The Air Force, with a few exceptions, operated generally within the Air Traffic Control Area, while the only naval unit, Patrol Squadron ONE, normally spent most of their air time outside of this area. In the event of a SAR incident the patrol aircraft first reported position, ground speed, track, and intention to their base radio (CW), and then shifted to airway voice frequency for the consumation of the intercept if one was required. CTG 7.3

monitored the base radio (CW) frequency at all times while search aircraft were airborne and if necessary would be able to employ the rescue facilities available within the task force.

A SAR operational agreement between CTG 7.4 and Commanding Officer, U.S. Naval Station, Kwajalein, provided for a definite understanding as to SAR responsibilities. CTG 7.4 exercised primary operational control of all SAR activities in the Eniwetok area. In the area adjacent to this control area, with the exception of Sampling Mission Flights, SAR action would be exercised by Commanding Officer, U.S. Naval Station, Kwajalein. An understanding was reached whereby the command closest to a SAR incident, regardless of the operational control exercised, providing that it was in communication contact, would take initial action. If any doubt existed as to operational control and responsibility, communications, or any other unforeseen problems, both agencies would initiate action.

All aircraft operating outside of the Air Traffic Control Area, with the exception of Patrol Squadron ONE aircraft which was monitored by CTG 7.3 aboard the USS ESTES (AGC-12), were monitored by CTG 7.4 for SAR coverage. These aircraft included weather reconnaissance, cloud tracking, project island resupply, and all other aircraft arriving or departing Eniwetok.

A destroyer was assigned a SAR station bearing 090 degrees, 30 miles east of Eniwetok during all shot times when Air Force aircraft were airborne. This assignment resulted from an SAR incident which occurred when a B-57 aircraft was lost during the CHEROKEE event. The aircraft experienced an emergency shortly after take off and pilot and passenger bailed out. A destroyer arriving early at the scene recovered the pilot but failed to locate the passenger. Prior to the completion of the SAR mission 24 May two destroyers, one destroyer escort, one AGC, one CVE (with helicopters embarked), several P2V model aircraft, and several UF model aircraft, participated in the search for the missing crew member.

Patrol Squadron ONE experienced two engine failures and one loss of power during the operation without casualties or damage to aircraft. One

engine failure occurred northeast of Bikini and the intercept by a UF aircraft from Kwajalein was made. Another engine failure occurred while the aircraft was northwest of Eniwetok. An interception was not required in this instance and aircraft landed safely on Eniwetok. The third aircraft which experienced a power loss, was on a search mission in a remote part of the Danger Area and a landing was made at Wake Island without incident.

#### 3.9.1 CONCLUSIONS

1. The SAR organization as provided was entirely adequate.
2. Coordination procedures established prior to the operation were satisfactory in all respects.
3. Facilities and aircraft assigned for SAR were considered adequate.

#### 3.9.2 RECOMMENDATIONS

1. While SAR facilities available in the lagoon area are considered adequate with LCM, crash boat, helicopters, and ships present, a fast sea-going surface crash boat is considered necessary in the event of forced landing outside of the lagoon area, particularly in the Bikini area where a strip alert UF type aircraft was not available for sea rescue. The wooden hulled crash boat assigned is not suitable for operations at sea and ships at anchor are not able to get underway soon enough to effect a rescue where the speed is so essential.

2. Keep the SAR Area Commander and SAR Coordination Center informed of all SAR operations occurring and forces employed within the Air Traffic Control Area.

#### 3.10 AIR PATROL OPERATIONS

Patrol Squadron ONE, based on Whidbey Island, provided fifteen P2V-5 model aircraft for security patrol of the 400,000 square miles of Danger Area. Commander Air Force, Pacific, augmented the squadron's original twelve aircraft by three additional aircraft to provide support for Project 2.64, the "Fallout Location and Delineation by Aerial Survey," project. A concept was adopted whereby all 15 aircraft would be utilized in accomplishing the security mission - and four specially equipped aircraft for Project 2.64

requirements as required after shots.

Security forces were to be maintained at maximum combat potential consistent with commitments required by the special nature of Operation REDWING. P2V aircraft must have an ASW capability, including AUV, but this capability was not to interfere with the primary mission of security. In actual operations the ASW was accomplished currently with the security searches.

Adequate pre-deployment time was available for the patrol squadron to form and train additional flight crews and prepare for the unusual scope of radiological safety requirements. A special team of staff RadlSafe personnel conducted a course at Whidbey Island. Subjects covered and participants were as follows:

Subject	All Hands	Flight Crews	Decontamination Crews	Time Required
Indoctrination	X	X	X	1 day
Airborne Monitoring		X		$\frac{1}{2}$ day
Decontamination		X	X	$1\frac{1}{2}$ -2 days
General Briefing	X	X	X	$\frac{1}{2}$ day

Additionally, one officer and four enlisted men attended the one week ABC course at San Diego; four officers attended the two week RadlSafe course at Treasure Island; one officer and two enlisted men attended the four week Radiac Instrument Repair School at Treasure Island; one officer attended the five week ABCD course at Treasure Island.

Patrol Squadron ONE departed CONUS 5 April 1956 for Kwajalein via Alameda and Barber's Point. Arrival date on Kwajalein was 11 April, and the squadron was required to be operationally ready on 15 April. 12,000 pounds of equipment plus 200 men were sent via Fleet Logistic Air Wing in four R6D model aircraft. Balance of squadron equipment and gear, approximately 74,000 pounds, was sent via surface transportation. The squadron arrived in the advance area with a total of 54 officers and 292 enlisted men. Fifty of the 292 enlisted men were taken from the Fleet Air Service Squadron 112 based at Whidbey Island. Upon the completion of the operation the personnel count decreased to 51 officers and 274 enlisted resulting from mandatory transfers, hospitalization and humanitarian reasons.

### 3.10.1 ACTUAL OPERATIONS VERSUS PLANNED OPERATIONS

Operations during the operation period generally followed planning with a few exceptions. Operations were as follows:

1. During periods between shots the Danger Area was searched twice by General Surveillance Patrols commencing on D-5 and completed on D-2.

2. On D-1 Concentrated Searches were conducted to cover the area of the predicted fall-out pattern. The search sectors normally included the area between 270 degrees clockwise through 040 degrees, and extending out a radial distance of 150 to 200 miles from ground zero. This search area was extended for approximately 120 miles in all directions to allow for the possibility of surface vessels entering the area from the time patrols ended D-1 and actual shot time.

3. On D Day ZEBRA, YOKE and Project 2.64 flights were conducted.

4. On D/1 Project 2.64, and if required, an air escort flight was conducted. When the LSD, USS CATAMOUNT, was assigned to transport a special device from Eniwetok to Bikini one P2V aircraft was required on station for ASW protection for the entire time.

5. D/2 Project 2.64 and air escort flights were conducted.

6. D/3 Project 2.64 and general surveillance searches were conducted and the cycle was repeated again in preparation for the next shot. Project 2.64 requirements usually were not required subsequent to D/3.

During the latter part of June when the shot schedule was falling behind a new concept was adapted. Beginning on D-1 concentrated searches were launched between 1300 and 1500, and continued daily until the shot was fired. The search area included all possible fall-out area, and standby aircraft were available to be launched if the fall-out pattern changed appreciably. Postponements and delays in shot schedule created no problem with the new concept. The squadron was able to sustain these "standby" searches indefinitely and CW communications were always so reliable between the squadron's base operations and the USS ESTES that excessive delays and postponements could normally be delivered to the-squadron before aircraft were

airborne.

A tabulated summary of flight operations conducted during Operation REDWING is listed in Table 2. A list of actual commitments included:

1. Searches - General Surveillance, Concentrated and Standby.
2. Air cover for movement of special devices from Eniwetok to Bikini.
3. Project 2.64 requirements and frequent trips to and from Eniwetok for calibration and maintenance purposes.
4. Covering ships found in the Danger Area or near boundary of Danger Area on D-1. Vessels normally were covered to insure their exact location at Zero Hour.
5. Post shot RadSafe requirements - ZEBRA, YOKE flights and substituting for Air Force aircraft on a few occasions to conduct radiation surveys over islands near the Danger Area if islands were in any danger of fall-out.
6. Searches for Scripps skiffs. Approximately every ten days an aircraft checked the mooring positions of fall-cut skiffs and if any were missing a search was directed.
7. SAR.

### 3.10.2 COMMUNICATIONS

Considerable more frequencies were planned to be used for air control than were actually required. Of the original assigned frequencies only two were actually used. 9009.5 KCS was the frequency employed and it was ideal for day or night air operations, and 5725.5 KCS, the secondary frequency, was used on a few occasions during the early morning hours when an unusual amount of static and noise was encountered.

The air/ground circuit, frequency 9009.5 KCS, was used for administrative traffic as well as for air control. No trouble was experienced, nor was the circuit ever over-burdened with traffic which required the activation of an additional circuit.

Two second class CW radio operators were able to handle the entire air operational traffic aboard ship without difficulty throughout the entire



operation.

Air communication facilities in Kwajalein were very adequate. The receiving and transmitting facilities were manned 24 hours a day and alerting the squadron for air traffic presented no difficulties. During hours when aircraft were not airborne and the air/ground circuit was not activated Kwajalein monitored a speaker watch on the circuit which enabled the squadron to be called at any time for traffic. A teletype line was established between the base communication center directly to the duty officer of the patrol squadron.

### 3.10.3 CONCLUSIONS

1. A total of 15 aircraft is considered necessary to give adequate surveillance to the established Danger Area and to accomplish the additional commitments which were required or added during the operation.
2. The probability of detecting surface fishing vessels utilizing APS-20 radar was considered to be one hundred percent.
3. The size of the expected fall-out area was never so large that difficulty was experienced in covering the area sufficiently prior to shot time. If required, practically the whole area would have been covered, and during D-1 periods approximately 75 per cent of the area was actually covered.
4. The only serious operating difficulty occurred with the airborne radar equipment. Considerable radar failures were experienced which were contributed to the hot, humid, climatic conditions.
5. Navigational aids were considered adequate. Loran was reliable over the entire Danger Area.
6. The available air navigational charts for the general area are inadequate.

### 3.10.4 RECOMMENDATIONS

1. The Hydrographic Office should prepare charts covering the following areas:

VR Series - 04-00 S to 25-00 N and 144-00 E to 173-00 W  
V30 & VL Series - 06-00 N to 22-00 N and 152-00 E to 180-00

2. That future operations of similar size be planned and conducted following the general scheme of Operation REDWING.

### 3.11 HELICOPTER OPERATIONS

HMR-363 home based at Santa Ana, California provided 15 HRS-1 model helicopters to provide ship-to-shore and inter-island helicopter lift at Bikini in support of Operation REDWING. Actual helicopter operations generally followed planned operation with few exceptions. One serious problem developed in a very critical time of the operation. Early in April, during the very important operational build-up phase, approximately one month prior to the first scheduled shot, the HRS-1 helicopters experienced several undetermined engine failures which necessitated grounding all aircraft until the cause could be determined and remedied. One engine failure later resulted in the complete loss of the aircraft, but fortunately there were no casualties. As a temporary expedient five Air Force helicopters were transferred to Bikini from Eniwetok to continue the airlift. HRS-1 helicopter engine failures remained partially undetermined which eventually resulted in their complete replacement with HRS-3 model helicopters.

The USS PINE ISLAND departed San Diego with seven HRS-3 helicopters transferred from the Marine Corps Station, Santa Ana, and eight HRS-3 helicopters were shipped from the Marine Squadron in Kaneohe, T.H. via USS CURTISS. The squadron was fully operational with HRS-3 aircraft on 28 April.

Adequate pre-deployment time was available for the helicopter squadron to prepare for the operation. The squadron was alerted in early June. However, they were late in receiving the benefit of personnel stabilization which should have been effective about two months before deployment. Transfers and replacements were taking place within the squadron late in the preoperational phase which deterred training and complicated acquisition of security clearances which were averaging 12 weeks to complete.

HMR-363 divided into two units and departed the CONUS at different times. The advance detachment (ABLE) consisting of a total of 13 officers and 55 enlisted men were required to be operationally ready in the forward

area by 15 February and relieve the Air Force 4930th Support Group Test on Bikini Atoll operating H-19 helicopters and L-20 aircraft. Detachment ABLE was sent to Bikini as follows: one officer and 11 enlisted men with eight HRS-1 helicopters departed Port Hueneme aboard the MARINE FIDDLER. The balance of Detachment ABLE consisting of 12 officers and forty-five enlisted men departed Travis Air Force Base via air transportation on 26 January, 1 February and 2 February. The rear echelon with a total of 11 officers, 60 enlisted and one civilian technician departed San Diego aboard the USS BADOENG STRAIT (CVE-116) on 26 February for San Francisco to load Air Force aircraft departing San Francisco on 27 February for Eniwetok. The two components joined on 20 March in the forward area to accomplish the airlift requirements on the Bikini Atoll.

Actually atoll operations generally followed planned operations. All requests for passenger and cargo space requirements were processed through the J-3 Section of Task Group 7.1. The responsibility for coordinating the Bikini Island airlift requirements was assigned to a TCA (Transportation Control Authority) from Task Group 7.5. During operations afloat for short periods of time on D-1 and D Day, the TCA was located on the BADOENG STRAIT where all task force transportation requests were coordinated and a workable airlift schedule was promulgated with assistance from the Air Operations Officer of the BADOENG STRAIT and the Duty Officer of the helicopter squadron. These flights mainly consisted of special project flights generated by project personnel in the J-3 Section of Task Group 7.1

During operations ashore which amounted to approximately 95 percent of the time, Task Group 7.5 established a dispatching system on three islands with the main dispatcher on Enyu Island. The main dispatcher had radio and telephone contact with his subordinate dispatchers on TARE and FOX Islands. All lift requests which were approved by the J-3 Section of Task Group 7.1 terminated at the Enyu Island dispatcher's office and a flight schedule for the following day promulgated. Special flights which were unforeseen the previous day were given to the squadron operations duty officer for fulfillment

as aircraft became available.

Some exceptions to planned operations were various requests made by Task Group 7.1 to perform missions involving safety of flight. The major requirements requested of the helicopter squadron in the forward area without prior knowledge were:

1. Helicopter Probe Mission. Much consideration and concern was given to the feasibility from a flight safety standpoint. It was eventually resolved that missions were justified and could be accomplished with an acceptable risk if conducted at 1000 feet. Several missions were flown and reduction of exposure of radiation to personnel in the aircraft was an important factor.

2. Night Floodlight Mission. A request was made for a night mission in a helicopter in which the helicopter was required to hover at five thousand feet with his landing lights extended and on over a designated island. At the time this flight was requested parachutes were not available. This flight was denied and considered too hazardous due to lack of horizon or other visual reference points which would necessitate dependence on instruments for this flight.

3. Beach Ball. The objective of this mission was to place these ball-housed radio transmitters in highly contaminated areas that precluded helicopter landing. When once the beach balls were dropped the helicopter orbited away from the area and was equipped with special project radios that monitored the signal from the beach ball. The helicopter requirements for this project were a little unusual in that the ballistic properties of a five foot plastic beach ball had to be investigated considering all the variables of weight, air speed, altitude, wind direction and course. The problem of getting a five foot beach ball out of a four foot square door opening was also considered. This commitment was eventually accomplished by partially deflating the balls and discharging them directly through the door from the cabin space.

A tabulated summary of helicopter flight operations conducted during Operation REDWING is listed in Table 3. A statistical summary of the Advance

TABLE 3 - HMR-363 OPERATIONAL STATISTICAL SUMMARY

Month	No. A/C Assigned	% A/C in Commission	1		2		3		4		5		6		7	
			Number of		Scientific		Misc.		TOTAL		AVGAS Gal.	AVOIL Gal.	Accidents			
			Sorties	Hours	Sorties	Hours	Sorties	Hours	Sorties	Hours						
March	15-19 = 6 20-31 = 15	83%	324	405	-	-	16	324	421	14,760	267	1				
April	15	80%	321	248	-	-	61	321	309	11,065	209	0				
May	*14	80%	909	896	49	78	128	958	1102	34,078	517	1				
June	15	+80%	728	718	72	100	57	800	875	30,007	472	0				
July	14	80%	801	720	61	94	38	864	852	30,500	480	0				

Column 1 - Operational flights exclude column 3.

2 - Operational flights exclude columns 4 and 5.

3 - Scientific data recovery flights exclude columns 1 and 5.

4 - Scientific data recovery hours exclude columns 2 and 5.

5 - Pilot training, tests, SAR, etc., where passenger/cargo not involved.

6 - Total sorties includes columns 1 and 3.

7 - Total flight hours includes columns 2, 4 and 5.

\* - Ground accident 9 May reduced number of aircraft to 14, and 14 remained for duration.  
 + - This figure is based on 15 aircraft assigned and chargeable. One aircraft has been lost to the squadron by transfer since last month and one aircraft has been ACOG since 5 June 1956.

Detachment (ABLE) for the period of 16 February through 20 March was:

8 aircraft assigned - 7 aircraft was the average availability  
718 sorties were flown  
802.5 flight hours were flown  
6,607 passengers were hauled  
7,345 pounds of cargo was hauled

### 3.11.1 CONCLUSIONS

1. Fifteen aircraft assigned is considered sufficient to accomplish the lift requirements for an operation the size and scope of Operation REDWING.
2. Helicopters should be hoist equipped and installed without delay long before the operation to forestall bottlenecks which have occurred on the two previous operations.
3. The squadron allowance of 39 officers, including two ground officers, and 122 enlisted is considered adequate if augmented with five to eight enlisted in the lower pay grades to offset the many requirements for working parties and special details which were required so frequently aboard the carrier.
4. The squadron should have the capability of operating completely aboard the carrier, but should be allowed to operate as many aircraft ashore and base as many officers and men ashore as facilities and quarters will allow.
5. Moving helicopters into the forward area by a ship similar to the MARINE FIDDLER is entirely acceptable. The large hatches and high headspace provided protected shelter for stowage and is preferred to transportation on the flight deck of a CVE with its attendant exposure to salt spray. Eight helicopters were shipped and the stowage space could have easily accommodated 15 had the space been reserved for such purpose. Only one tail cone was damaged enroute.
6. While operating conditions aboard the CVE were acceptable under the circumstances they were not ideal operating conditions for the following reasons:
  - a. The ship's allowance augmented with a helicopter squadron makes living quarters too cramped for such a prolonged time in a tropical climate.

b. The RAYDIST equipment located on the forward part of the flight deck limited parking space for helicopters, and especially from a flight safety viewpoint, the RAYDIST obstructions prevented helicopters from taking off in a forward direction where they may remain over the flight deck to maintain translational lift as long as possible. Obstructions prevent a forward departure from the flight deck and a "slide out" must be executed.

c. If a number of helicopters become contaminated at one time, and it is desired to keep the deck in a land and launch status, the flight deck will accommodate only two helicopters.

d. The CVE lacks sufficient fresh water for decontamination purposes, or frequent removal of salt spray from aircraft surface.

### 3.11.2 RECOMMENDATIONS

1. Squadron personnel should be stabilized early in the planning phase and be up to authorized allowance well in advance of deployment. Stabilization of personnel is considered essential to facilitate planning, training and allow time for the squadron to effectively work as a unit prior to deployment.

2. Authority be given to the Marine helicopter squadron early in the planning phase authorizing direct liaison with naval commands and units to facilitate planning and training.

3. Keep the capability for the entire squadron to operate independently afloat but allow the squadron commander at his discretion to keep as many men ashore as he desires. This is considered to be a big morale factor as well as the fact that operating ashore due to the special nature of the operation can be accomplished more effectively.

4. Assigned helicopter squadrons should provide their own vehicle support and insure late models for which spare parts are available.

5. All projects which may require the use of helicopters for other than routine taxi service should submit their requirements in detail to the squadron furnishing the helicopters in ample time to make a study of the flights so that an agreement can be reached before arrival in the forward area.

6. All helicopters, both Navy and Air Force, in the forward area should be like models if possible to allow the exchange of high priority parts and spares.

7. Helicopters should be equipped with floatation gear. Unless an extremely poor water ditching seriously damages the aircraft and its floatation gear, passengers could be safely evacuated and the helicopter saved from a ditching in deep water.

8. Consideration should be given to replace HRS-3 model helicopters with Marine HUS models. Payloadwise the HUS can do the work of 3½ HRS-3, and more expeditiously as the HUS cruising speed is about 100 knots versus 65 knots for the HRS. A combination of five to seven HUS and five HRS-3 would be the optimum. Advantages would be a reduction in the total number of helicopters to perform the same amount of work required in Operation REDWING, and greater operational efficiency. The disadvantages would be that two stocks of supplies and spares would be necessary, and HUS models require a larger carrier for air operations afloat.

9. Dispatching and control of helicopter flights could be handled more efficiently with the addition of a Radio Dispatcher and a Radio Dispatcher Frequency. The Radio Dispatcher would merely augment the system of operation employed for Operation REDWING as described in paragraph 3.11. Control of the airborne helicopter position reporting system would be taken from the airfield tower and placed in control of the Radio Dispatcher. He would track all aircraft by position reports and talk directly with pilots on matters of passengers, cargo and pick up points. The airfield control tower operator would only be concerned with helicopter operations within a three mile radius of the field.

10. That future operations of similar size be planned and conducted following the general scheme of Operation REDWING.

### 3.12 WEATHER OBSERVATIONS

Task Group 7.3 was responsible for all weather observations, both surface and aloft from Bikini Atoll. Because of the requirements for

continued observations during periods of total evacuation, it can be assumed that the Navy task group will have this requirement on future operations.

The USS CURTISS (AV-4) was responsible for all upper air observations at Bikini. Winds aloft were observed by use of the Mark 37 Gun Fire Control Radar and the Mark 25 Computer. Heights attained were excellent and compare favorably with some of the land stations. Maintenance was good with only a few radar outages of short duration occurring. The successful results obtained by the CURTISS were due to the thorough training of the Rawin Teams before arrival at the Pacific Proving Ground, the routine maintenance schedule, and the high performance balloons provided by JTF-7.

The destroyer element functioned as mobile weather stations in the uncovered area to the northwest and northeast of Bikini and as a backup to the existing facilities at Bikini and Eniwetok on shot nights. Two aerographer's mates were assigned to each destroyer with an aerological officer assigned to the DesRon staff. Winds aloft were observed by use of balloon reflectors, LOKI Wasp Rockets, and 5 inch window shells. The data of the destroyers on weather station were a valuable aid in forecasting, and their local employment on shot nights aided in the late decisions. The effectiveness of these several winds aloft systems will be discussed below.

During the operational phase, the aerological facilities at the U.S. Naval Station, Kwajalein becomes an intergral part of the JTF-7 Weather Unit. Special balloons were provided by JTF-7. Four soundings daily were taken during the latter part of the operation. Because of its strategic location, it can be assumed that complete upper air and surface observations from Kwajalein will be required for future operations.

The Aerological Office of the USS ESTES (AGC-12) came under the operational control of JTF-7 during the operational phase. It was manned by weather officers of the J-3 Division, Headquarters, Joint Task Force SEVEN, prior to Bikini events. This office was responsible for briefings of CJTF-7 and CTG 7.3, weather communications between TG 7.3 and Headquarters, JTF-7, and for the routine surface observations at Bikini. The complement of aerographer's mates on the USS ESTES was increased by CNO to a total of 10

to take care of this additional workload.

The USS BADOENG STRAIT (CVE-116) issued the routine SOPA weather forecast to all ships present Bikini.

### 3.12.1 DATA AND CLIMATOLOGY

All surface, upper air, and upper wind data gathered during Operation REDWING will be issued as a supplement to the JTF-7 Operation Report. It is expected that this report will be ready for distribution during the fall of 1956. In addition, a comprehensive climatology for the Pacific Proving Ground is being prepared by JTF-7 for distribution in the spring of 1957.

### 3.12.2 OCEANOGRAPHY

A preliminary report on the oceanography of the Pacific Proving Ground was written by Mr. A. R. Gordon of the U.S. Navy Hydrographic Office during the early part of Operation REDWING. This report was given a limited distribution by JTF-7. It is understood that this report will be expanded by the Hydrographic Office to include Operation REDWING data.

### 3.12.3 EQUIPMENT AND SUPPLIES

The LOKI Rockets used by the destroyer element for rapid wind determination at high levels did not operate as well as expected. The maximum altitudes attained were around 100,000 feet, whereas it had been hoped to reach 130,000 feet. However, these rockets did prove valuable in that they could sample a 10,000 foot layer of the atmosphere much more rapidly than a balloon sounding. It can be assumed that there will be a requirement for these rocket systems on future operations.

Five inch window shells were used by the destroyer element for rapid wind determination below 35,000 feet. They proved particularly useful in determining and verifying the flow in the lower transition layer for the Eniwetok events. On several occasions, significant trends just prior to shots were determined by the window shells when it would have been impossible to obtain the data by balloon soundings. It can be assumed that a requirement for this type sounding will exist on future operations.

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Aerological supplies are hard to obtain in the Pacific Proving Ground.

Weather requirements are high as the safety of the task force and the surrounding atolls depend largely on numerous observations and accurate forecasts. Consequently, many more soundings and observations are required than in any other type of operation. All units should carefully consider their requirements on aerological expendables on any future operation.

#### 3.12.4 WEATHER COMMUNICATIONS

Task Group 7.3 provided RATT and facsimile terminals on the USS ESTES (AGC-12) to service the aerological office. Both circuits were between the ESTES and JTF-7 Weather Central, Parry Island. From an aerological standpoint, these circuits provided all the data required by CJTF-7 on board the ESTES. The RATT was also used as a primary means of sending TG 7.3 observations back to the weather central. The performance of these circuits will be discussed in more detail under communications.

#### 3.12.5 CONCLUSIONS

1. In general the weather services provided by TG 7.3 are considered adequate.

2. Upper air data obtained by the USS CURTISS (AV-4) was transmitted to the USS ESTES (AGC-12) by normal CW circuits. During the early morning just prior to shot time these circuits became loaded and the rapid delivery of the data becomes critical.

3. While the data obtained by the CURTISS was more than adequate, it is believed that improved wind finding systems may be available for future operations. In particular, the SMD would give higher soundings and greater reliability.

#### 3.12.6 RECOMMENDATIONS

1. It is recommended that a two-way low power RATT circuit be installed between the ESTES and the CURTISS with terminals in both aerological offices in order to expedite the handling of the data.

2. It is recommended that liaison be maintained with BuAer and Op-533 concerning the installation of this equipment on the CURTISS for the next operation.

3. While the two destroyers assigned to Operation REDWING did valuable service weatherwise, this use was a compromise between weather requirements and availability. Four destroyers would enable more distant, and therefore more useful weather stations to be used.

3.13 AIRCRAFT RADIATION SURVEY (Project 2.64 - Fallout location and Delineation by aerial surveys).

3.13.1 PLANNING STAGE

Aerial surveys involving P2V aircraft were scheduled originally for CHEROKEE, ZUNI, FLATHEAD, HURON, NAVAJO, APACHE and TEWA. Four P2V aircraft from PatRon ONE based on Kwajalein had the following special project equipment installed:

"Top Hat" detector (installed in after tail section over the camera hatch).

Control assembly and strip chart recorder.

Telemeter tape recorders.

Power supply.

ART-13 transmitter.

Original plan called for flights to originate from Kwajalein and instruments to be serviced and calibrated on Eniwetok. During the period D-7 to D-1 prior to each shot, each aircraft in rotation was to land at Eniwetok Island during daylight hours so that repairs and calibration could be undertaken. This command recommended, in the early stages of planning, that the calibration and repairs of project instruments be done at Kwajalein. From D Day to D/6 aircraft surveys were to be flown out to approximately 300 miles from Bikini. Two planes were to be used each day with two on standby. This aircraft utilization was planned to keep contamination levels down, so that aircraft used for later flights would be able to detect the relatively low radiation on the surface after D/2. Flight plans were based on fall-out prediction and control was maintained during each flight so that change in aircraft could be effected simply. The purpose of the flights was to determine the amount of radiation absorption experienced through various altitudes and data secured at various altitudes were to be used to develop a relationship for predicting fall-out attenuation over land. Telemeter

equipment and communication channels were installed in the Program 2 Plot on board the USS ESTES (AGC-12), to facilitate communications with and control of the aircraft directly from the fall-out plotting center.

Preoperational planning conducted by Project 2.64 could have been improved considerably from a military standpoint. The aircraft were scheduled to be operationally ready in the Pacific Proving Ground along with the other aircraft of VP-1 by 15 April 1956. Aircraft were made available for project installation in sufficient time but the equipment was not completely installed at NAS, Alameda until the latter part of February 1956, leaving little time for a thorough flight check and correction of discrepancies prior to deployment. The civilian engineers from the New York Operations Office, AEC sponsors of Project 2.64, did not have the necessary liaison with various military agencies involved. The net result was that the squadron was not sufficiently advised from the beginning to insure that adequate progress was made through military channels. Presence of a representative on the scene at Alameda to check detail and progress of equipment installations and to make arrangements for in-flight and ground checks of equipment would have detected the discrepancies later discovered in operation of the telemetering gear. The New York Operations Office requested that four electronic technicians from VP-1 be made available for a special one month's school in New York. This school was to train one man from each crew in basic maintenance and operation of project equipment. The four men were made available in November 1955, approximately three months prior to deployment of the squadron, but the school was not set up by the New York Operations Office. The school was finally set up in February 1956. In view of the lateness of the convening date and the fact that the squadron was under going an Operational Readiness Inspection and simultaneously preparing for deployment, the Commanding Officer, VP-1 requested that the school be set up in Alameda rather than in New York City. This request was not formally acknowledged by the New York Operations Office, but a representative was sent to Alameda and the crews received limited instructions prior to deployment. Pilots involved received no check-out in

special equipment prior to deployment.

### 3.13.2 CONCLUSIONS

1. Four aircraft with special configuration is considered minimum for this type project in an operation of the scope of Operation REDWING. Number of aircraft should be increased if the scope of future operations is broadened.

2. Use of specially configured aircraft to fly security missions on availability basis is satisfactory.

3. Considerable time and effort was wasted on flight and ground check of project equipment after arrival in the Pacific Proving Ground.

4. The telemetering equipment failed to function correctly throughout the operation.

5. Training for technicians was too little and too late.

### 3.13.3 RECOMMENDATIONS

1. That for an operation of the scope of Operation REDWING four aircraft be employed for this type project, with the number assigned made greater as the scope of the operation increases.

2. That in future operations effective liaison should be established between project personnel and the operational assigned squadron to insure that necessary action required from military sources is undertaken in an early and effective manner.

3. That training on special equipment for military technicians be undertaken as early as possible.

4. That the training for these technicians be given, if at all possible, at the squadron's home base.

### 3.14 OPERATIONAL PHASE

Soon after arrival in the forward area, it became apparent that planned procedures for operation of aircraft in conducting the project were incorrect. Aircraft were based on Kwajalein and staged all their flights through Kwajalein. Project engineers were based on Parry Island, Eniwetok Atoll and performed their calibration and ground checks on Eniwetok Island,

Eniwetok Atoll. This geographical separation led to a considerable amount of time wasted because of distances involved. Operations were difficult to coordinate; it was necessary to make arrangements to have aircraft fly from Kwajalein and, on arrival, if project work could not be completed, aircraft were usually not permitted to remain overnight on Eniwetok Island because of lack of parking spaces and were thus forced to return to Kwajalein with work not completed. This made many extra flights necessary. Kwajalein has a comparatively large field with adequate parking space and ample room for any project test installation. It is believed that project personnel could have been permanently based on Kwajalein where the aircraft were available to them for complete ground checks and with such arrangements the progress of operation would have been greatly enhanced.

#### 3.14.1 IN-FLIGHT PROCEDURES

A project engineer originally attempted to direct the aircraft over a voice radio net without having any knowledge of air to ground voice procedures and without knowing the capabilities and limitations of the aircraft assigned. Consequently, many things were tried which proved not feasible and control was most inadequate. It became necessary to have the Staff Air Operations Officer supervise the entire procedures of operating program aircraft and for him to train assigned enlisted radio personnel in fundamentals and procedures of radio control of aircraft. Once this became effective, the project operated effectively and smoothly from the control center. In the earlier shots aircraft became contaminated on D Day when they were unintentionally directed into the area of heavy contamination. While the contamination levels were not high from the standpoint of personnel dosage the background readings in the aircraft became too high to detect the lower, but still significant, radiation intensities on subsequent days. This rendered these aircraft useless for subsequent missions until their radiation level was reduced, either by decontamination or by natural decay. This problem was eliminated late in the operation by not sending aircraft into areas of unknown contamination on D Day.

### 3.14.2 PERSONNEL

The personnel available for conducting Project 2.64 aboard the USS ESTES (AGC-12) was more than adequate. Judging from the requirements for this project during Operation REDWING which involved four survey aircraft the following personnel requirements are recommended as being required if operations must be conducted aboard ship. Normally the hours of operation were from 0800 until 1700 beginning D Day and continuing through D+3 or D+4. On several occasions aircraft were not needed on station until 1000 or 1100 and then operations were extended to 2000:

One military supervisor (naval aviator). If it is not possible to have one permanently assigned to the project, supervision can be done by the naval aviator assigned to the naval task group.

Two project engineers.

Two plotters (one for relief)

Two recorders (one for relief)

Two radio operators (one for relief)

The enlisted men enable the project engineers to be free to evaluate the data as it is being received from the aircraft. In addition to the personnel listed above for aboard ship, there should be at least two project personnel permanently stationed where the aircraft are located. With the maintenance and calibration work being done where the aircraft are actually based, and with engineers available to fly an occasional mission to iron out trouble which occurs in the air with project equipment, the whole operation could be conducted efficiently and effectively.

### 3.14.3 COMMUNICATIONS

Communications were generally good within the limits of frequencies assigned. Voice control between USS ESTES (AGC-12) and aircraft was not too successful because of limited range. This was partially solved by using relay procedures when two aircraft were airborne on the same mission. Effective maximum range was about 125 miles. Beyond this the CW circuit was employed to control aircraft. This CW circuit was used however, only as a last resort because it had inherent delays caused by problems of drafting

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messages and transmission time both from control center and from the aircraft.

#### Frequencies Assigned (HF)

3130 KCS, 6693 KCS	Aircraft Telemetering
3151 KCS, 6708 KCS	Aircraft Telemetering
3088 KCS, 6745.5 KCS	Navigation, Ship/Aircraft

#### 3.14.4 CONCLUSIONS

1. Operations split between Kwajalein and Eniwetok Atoll are cumbersome, inefficient, and needlessly expensive.
2. Operation of aircraft can be more effectively controlled from their home base using base communication facilities.
3. Code developed by the project was unsuitable in that it was too complicated and involved transmissions of too great a length.
4. It is necessary that a naval aviator be present to supervise operations of patrol aircraft.
5. Communication frequencies were inadequate and should be critically examined.
6. Air to ship telemetering system did not function in the manner designed.

#### 3.14.5 RECOMMENDATIONS

1. That all test and calibration of equipment be accomplished at the aircraft home base.
2. That a naval aviator, experienced in operational control of patrol aircraft, be assigned to coordinate operations of aircraft assigned to a mission of this type, and that he review all proposed control procedures critically prior to the operational phase of this project.
3. That clear telemetering and air to ship communication frequencies be requested and assigned, allowing a choice so that a day or night frequency could be chosen for best range and operation.

#### 3.15 RADIOLOGICAL SAFETY

##### 3.15.1 GENERAL

The mission of the radiological safety organization for Operation

REDWING was determined to be; (a) protection of personnel and equipment from radiological hazards, (b) training of personnel in radiological safety, and (c) evaluation of effectiveness of radiological safety training and equipment.

### 3.15.2 ORGANIZATION

The organization of Task Group 7.3 for radiological safety during Operation REDWING was based on the existing shipboard and unit Damage Control and Atomic, Biological and Chemical Defense (ABCD) organization supplemented by further training and organization in atomic defense in order to meet minimum standards for radiological safety during the operation.

Additional qualified personnel on the staff were required in order to render necessary advice, assistance, and training to all ships and units. In addition, this group developed new procedures and operational techniques in radiological safety for use by fleet units.

### 3.15.3 INITIAL PLANNING

The Assistant Plans and Operations Officer (Atomic Defense) was relieved in early July 1955, after Operation WIGWAM. Active planning was begun in August 1955.

At this time, planning letters detailing advice and assistance were prepared and forwarded to all ships and units assigned. All ships and units available on the West Coast were later visited to discuss their part in the operation and to further advise them concerning their RadlSafe problems. Visits were also made to other task groups and activities to discuss matters of mutual interest concerning the operation.

Modifications to ships and aircraft for radiological safety considerations and in support of other task group operations were coordinated with the activities concerned. Logistic requirements for radiological safety operations were promulgated to all ships and units, and procurement of various items was coordinated with other activities. For the most part, ships and units were required to obtain radiological safety clothing, radiac spare parts and batteries, decontamination materials, and other supplies. They were required to obtain radiological safety clothing, radiac spare parts and batteries,

decontamination materials, and other supplies. They were required to pay for these items from their quarterly operating allotments. This gave rise to several problems, such as (1) insufficient funds available to procure required supplies, especially for smaller ships, (2) lack of information available to type commanders on the special logistic requirements for an operation of this nature and the consequent need for augmentation of quarterly operating allotments, and (3) difficulties in justifying requisitions for materials which were required for the operation yet were not on allowance lists or were in excess of allowance.

To partially compensate for the above problems and to insure availability of clothing and supplies for any possible emergencies, a reserve supply of clothing, radiac spare parts and batteries, and other special materials, was obtained by the staff radiological safety officer. This gave rise to problems in procurement, stowage, issue, accounting, and roll-up, which are not normally within the province and capabilities of a small operational staff. Advance information was requested and received from the Bureau of Naval Personnel and the Bureau of Medicine and Surgery, concerning enteries to be made in service and health records of personnel exposed to ionizing radiation during the operation.

A reference library and file system was set up to facilitate solution of technical problems during the operation. Forms and information pamphlets were also devised and distributed to disseminate information, facilitate recording and reporting, and to provide check-off lists for preparations and inspections.

The Radiological Safety Annex to CTG 7.3 Operation Plan (Annex G) included, in a readily declassifiable manner, all possible information and directives concerning radiological safety which would be needed during the operation. An advance copy of Annex G was sent to all ships and units. Subsequent changes and supplementary letters were promulgated, but considerable revision of the contents of Annex G is necessary prior to use in future operations. In particular:

1. Radiological safety regulations should be more realistic and permit

a more liberal "on the spot" interpretation of maximum permissible contamination limits (MPL) by qualified personnel.

2. Preventative measures should emphasize the necessity for cleaning firemain to insure maximum water supply to washdown systems.

3. Countermeasures should detail more specific instructions concerning fall-out detection and evaluation.

In consideration of the need for increased emphasis and effort on training and indoctrination for Operation REDWING, an over-all proposal for radiological safety training was formulated and discussed with the Bureau of Naval Personnel, U.S. Naval Radiological Defense Laboratory (NRDL), and U.S. Naval Schools Command. A radiological safety training officer and chief petty officer from the Naval Schools Command, Treasure Island and a civilian consultant for radiological safety from NRDL were assigned to Task Group 7.3 staff. Arrangements were made for obtaining training films, slides, projection equipment, and other training aids. The two military personnel reported for duty at NRDL in January 1956 and commenced planning and preparations for the Task Group 7.3 training program.

In addition it was decided that a manual be made available for (1) use as a text in training (2) a pamphlet for "all hands" indoctrination, and (3) a reference manual for technical personnel. The most acceptable and available publication for these purposes was a proposed revision to a NRDL manual entitled "Radiation and Contamination Control." One thousand copies of this manual were procured and distributed to all ships and units.

Participation of personnel from naval training activities in field test operations was another innovation. Such participation was requested of and approved by BuPers in order to permit instructors from the several naval activities conducting training in radiological safety and atomic defense to gain experience by witnessing test detonations and radiological safety operations, while at the same time "paying their way" by actual participation in training programs and radiological safety operations. In addition, such participation tended to promote better exchange of information and doctrine

between personnel teaching radiological safety and personnel engaged in actual radiological safety operations in the field. Although participation was limited, it was worthwhile.

#### 3.15.4 CONCLUSIONS

1. Earlier planning and implementation of training, visits to ships and units, and other staff functions is indicated for future operations. Visits should be undertaken earlier, more frequently, and for longer durations of stay than was possible for Operation REDWING. The same conclusion holds for visits to other task groups and activities concerned in the operation. Modification to ships and aircraft at West Coast locations also require personal contacts.
2. Previous experience and continuity between operations is highly desirable in filling the billet on the staff of Assistant Plans and Operations Officer (Atomic Defense).
3. Logistic requirements for radiological safety during Operation REDWING imposed some hardships on assigned ships and units. Type commanders and supply activities concerned should be better advised on such matters to facilitate their understanding the needs of ships and units assigned. Some emergency materials and special equipment must be procured, stowed, issued, and returned on roll-up by staff action. In addition personnel and facilities should be available to accomplish the necessary stowage and issue for the field use of the equipment (see above).
4. Further revision and ultimate printing and distribution to units of Task Group 7.3 of a training, indoctrination and reference manual is highly justified for the next operation.
5. Training for future operations should be conducted earlier and be more comprehensive.
6. The participation of personnel from established ABCD training activities in test operations was very successful, although limited. Similar participation on a larger scale would be very worthwhile in future operations.
7. With exceptions as noted, radiological safety planning for Operation REDWING achieved desired results and is considered to have been adequate

and satisfactory.

### 3.15.5 RECOMMENDATIONS

1. That planning for future operations commence immediately after the conclusions of the preceding operation. This includes appropriate visits to ships and units assigned, and to other task groups and activities concerned.
2. That the staff billet of Assistant Plans and Operations Officer (Atomic Defense) be filled with an officer who has had experience on a previous operation.
3. That adequate provisions be made to procure and stow on an appropriate ship for issue as needed, the reserve supplies and special equipment for radiological safety operations. Custody control of these items can be detailed to this ship for issue as directed by CTG 7.3.
4. That type commanders be apprised, by letters and visits, of the materials not on allowance lists or in excess of allowance which will be required by ships and units assigned.
5. That radiological safety training for future operations be planned immediately upon the conclusion of the preceding operation. Training should commence as soon as units are assigned and be accompanied by a team of experienced and qualified instructors, temporarily assigned to Commander Task Group 7.3. All instruction should be completed before the first scheduled detonation. This instruction should be in addition to the supplement training available under regularly established courses.
6. That supply activities concerned be apprised, by letters and visits, of the materials not on allowance lists or in excess of allowance which will be required by ships and units assigned.
7. That increased participation by instructor-observers from BuPers training activities be planned and requested for future operations.
8. That two qualified radiac instrument electronic technicians be assigned to the staff at least four months prior to deployment for the operation, and that they be employed as for Operation REDWING.

### 3.15.6 RADIOLOGICAL SAFETY TRAINING

The purpose of the radiological safety training program of Operation REDWING was to train all personnel of Task Group 7.3 in the methods and procedures of dosage and contamination control. The training program was conceived and designed to meet two objectives: (a) to teach personnel how to protect themselves from radiological hazards and to improve the state of readiness of naval units in radiological safety, and (b) to evaluate the effectiveness of radiological safety training now being given to the fleet units and their readiness for atomic defense operations.

It was determined that this program could best be carried out by having available in the Pacific Proving Ground a radiological safety training team. The team consisted of the following personnel; one lieutenant; one chief petty officer, chief damage controlman; and one civilian, health physicist; all having a background in radiological safety training.

The first concern was to develop course curriculum, prepare and obtain training aids, and conduct unit training prior to deployment of ships to the Pacific Proving Ground in March. The manual "Radiation and Contamination Control," prepared by the Health Physics Division of NRDL, was adopted for use in the course, and served as a basic background text for lectures. A field manual for the use of Radiological Safety Officers was prepared and printed at NRDL.

Due to the shortage of time before deployment, it was possible to conduct only a limited amount of training before units departed from the West Coast. Appendix A summarized the training completed during Operation REDWING. Twenty-four sessions, involving a total of 1036 personnel, were conducted. The preparation and manufacture of training aids, such as slides, demonstration devices, and practical exercises utilized the remainder of the time before the training team boarded the flagship at San Diego on 14 March 1956.

The training team presented courses of instruction during March and April to the majority of participating units. The objective of the training was to offer a concentrated radiological safety briefing to all key personnel

on board a ship. The average class size was between 25 and 30. Personnel attending the course were generally the officers, chief and leading petty officers of the ship. Monitors and decontamination team members also attended many of the sessions. Personnel attending this course were to return to their units and give instructions to all hands. The one day course consisted of the following curriculum:

1. A resume of Nuclear Weapon Phenomena
2. Nuts and Bolts of Nucleonics
3. The Bomb, Its Effects, and You
4. Basic Radiological Safety
5. How to Monitor and the Use of Radiac Instruments
6. Principles of Radiation and Contamination Control - (An introduction to the manual)
7. General Discussion: Questions and Answers

In addition to the classroom sessions listed above, practical exercises in decontamination and monitoring were conducted on board ship. These exercises were scheduled in accordance with availability of the fleet units and involved personnel assigned to monitoring and decontamination teams.

During the shot phase, radiological safety training personnel were needed to supervise actual radiological safety operations and to assist the Radiological Safety Officer. This assistance consisted of effecting liaison and coordination with project personnel in the decontamination of test ships and barges by Task Group 7.3 personnel. Instructors were also detailed to various task group ships to act as observers and be available for technical aid as required. It was planned to continue training aboard ships during the shot phase, by conducting practical exercises. However, commitments for decontamination work and other operational matters interfered with this phase of the training program. It soon became evident that it was impractical to schedule any organized training after D-3 due to the unpredictability of ship movements. Briefings for all of the Radiological Safety Officers of Task Group 7.3 were held to discuss operational problems. The subjects covered in this briefing were as follows:

1. Introduction to Briefing
2. Weather and Fall-out
3. Decontamination Situation Report
4. Radiological Situation Report
5. M.P.E. and Clearances
6. AFSWP 99 (Dosage and Dose-Rate Curves of Residual Radioactivity).
7. Thumb Rules
8. Training Report
9. Radiological Safety Organization
10. Reports and Discussion

During the operation, service force ships rendering logistic support changed several times. It was necessary to indoctrinate the crews of these ships in the radiological hazards of the test operations, but again operational commitments prevented extensive training for these ships.

The task group television network was used to present a series of radiological safety programs. The programs presented were of the general interest type, aimed at indoctrinating all hands in basic radiological safety for Operation REDWING.

During the latter part of the operation, two officers and two chief petty officers, from naval training commands, reported to the staff for 30 days temporary additional duty as technical observers. These personnel were from the Fleet Training Groups in Newport, Rhode Island; Norfolk, Virginia; and Yokosuka, Japan. They were integrated into the staff radiological safety organization and thus were able to observe several detonations and to become active in actual radiological safety operations.

### 3.15.7 CONCLUSIONS

1. Operational radiological safety requirements were integrated with training so that personnel could understand exactly what was required and the reason for doing it. The maximum use of operational situations was made to supplement classroom training. Full advantage was taken of the only realistic atomic defense and radiological safety situations now available to fleet units.

2. Although there was little contamination of ships during Operation REDWING, the spread of contamination aboard ships was positively controlled, and the radiological exposure of personnel was held to a minimum.

3. The participation, as observers, of personnel instructing in naval courses dealing with atomic defense and radiological safety is a valuable contribution to their background in a subject that offers few opportunities for actual participation. While with the staff, all of the observers exchanged ideas, obtained new information and developed an "esprit de corps" making them better instructors.

4. The state of readiness in radiological safety of all naval units participating was improved. The training staff was afforded an excellent opportunity to learn what is good and what is poor in the radiological safety training offered naval personnel.

5. Training during test operations is of value to increase morale of the ships. Ship's personnel felt that a personal concern was being shown for their individual safety. During periods between shots radiological safety training provided a worthwhile subject which interested all participants since they were all involved.

### 3.15.8 RECOMMENDATIONS

1. That the radiological safety training program, as established for Operation REDWING, be continued for future operations held at the Pacific Proving Ground.

2. That the scope of radiological training be increased. All units should receive unit training from a staff training team before their deployment to the Pacific Proving Ground. Training at the Pacific Proving Ground should consist of briefing sessions and practical exercises. The hard core of training should be done while the units are in CONUS, but this training should be followed up by conducting briefings at the Pacific Proving Ground to insure a high state of readiness.

3. That, to facilitate 2 above, the training team should become active about six months prior to the operational phase.

4. That prior to the first detonation and upon the completion of formal training and briefing, an inspection and atomic defense exercise should be held by staff training personnel for each ship and unit. Deficiencies should be corrected before the first scheduled event.

5. That radiological safety training should be conducted from one central location.

6. That the potentialities of training via television warrant further development.

7. Radiac maintenance personnel should be located on the same ship with the training team if feasible to give better unity and coordination to the various staff functions.

8. That a greater number of personnel on duty at naval schools offering instruction in Atomic Defense and Radiological Safety should be ordered as technical observers to the naval task group during special weapon test operations.

#### 3.15.9 RADIOLOGICAL SAFETY PREPARATIONS AND COUNTERMEASURES

Commander Task Group 7.3 Operation Plan No. 1-56 and directives prescribed and recommended radiological safety preparations and countermeasures to all ships and units, and field trips were made to assist units with these requirements.

"Interim" washdown systems were installed on all ships of Task Group 7.3. This system consists essentially of the installation of plastic piping with special nozzles located according to a predetermined plan designed to provide for a complete "water curtain" coverage of all topside surfaces. Aluminum quick coupling piping is used on flight decks and other locations where it is more advantageous. Salt water is utilized from the ships fire-main system using canvas firehose jumpers from selected topside fire plugs. These interim systems are presently authorized for installation on all fleet units in the near future. Actual installations were accomplished by ships' forces with material procured and funded by Bureau of Ships. Technical assistance and supervision during installations was also rendered by Bureau

of Ships representatives. All ships were required to report results of testing washdown systems by letter. Although employed only occasionally during the mild fall-outs encountered during the operation, it is considered that washdown systems were very satisfactory and are one of the best available fall-out countermeasures. Ships were given guidance in the correct employment of these systems. Only minor problems in nozzle locations and coverage were experienced. Firemain pressure, due to limited pumping capacity, was critical on many ships. The major problem with these systems is reduced flow through firemain due to stoppage by accumulated marine deposits. This also results in a radiation hazard on ships steaming in contaminated water due to a pronounced tendency for radiological contaminants to adhere to such deposits, and the contamination level builds up with time spent in contaminated water. Processes are available for cleaning firemain and other salt water systems and should be accomplished on all ships prior to deployment for future operations.

It was considered impractical to take LCU's to sea on pre-shot evacuations at Bikini, although leaving them in the lagoon might result in serious contamination of these boats and consequent nonavailability for urgent scientific recovery missions. For Operation REDWING, it was decided to test the feasibility of using a "strippable coating" to effect more rapid decontamination in such instances. Discussions with Bureau of Ships and NRDL personnel resulted in Bureau of Ships procurement, funding, and transporting to the Pacific Proving Ground of the necessary paint, strippable coating, spray application equipment, and Sellers hot salt water removal equipment. Personnel from the boat pool and all destroyer types assigned were instructed in the use of the equipment. Temporary modifications to shore steam connections were accomplished on all destroyer type ships. Surfaces were prepared and LCU's were coated prior to the first contaminating event at Bikini. No serious contamination of LCU's was experienced, but durability and strippability of the coating is very unsatisfactory. Further technical developments of this decontamination procedure is indicated.

Radiac instruments are an important consideration in nuclear test operations as well as for atomic defense purposes. In previous operations it was assumed that established allowances for ships and units were adequate and satisfactory for such purposes. This was not the case, since ships' radiac allowances do not provide for:

1. An instrument capable of evaluating the beta component or combined beta-gamma intensities greater than 5 mr/hr. Beta-gamma intensities from fall-out in the order of roentgens/hr contain beta intensities greater than that from the gamma radiation. Ratios as high as ten to one were observed after fall-out during Operation REDWING.
2. A side window GM counter or similar instrument for more rapid and efficient personnel and equipment monitoring.
3. Pocket dosimeters in sufficient quantity and satisfactory reliability to meet requirements.
4. Automatic radiation (fall-out) detection devices with associated alarms.
5. An alpha particle detector which will work under field conditions.

Additionally it was found that most ships and units did not have complete allowances of radiacs on board, did not know where such equipment was stored, had not kept equipment in proper operating condition, did not understand proper procedures for care and use of radiacs, and did not have necessary spare parts and fresh batteries. A final consideration is that nuclear test operations are not normal situations insofar as radiac instruments are concerned and normal allowances are not adequate.

For Operation REDWING the known shortages in allowance were requested of all assigned ships, and arrangements were made to assemble instruments to fill such shortages at NRDL, along with a pool of instruments for supplementary issue at the Pacific Proving Ground. Authority was received from

BuShips to issue radiac instruments to ships on permanent custody to fill shortages in authorized allowances. All the foregoing instruments were shipped to NRDL, by BuShips radiac issuing activities, where they were inspected, tested, and calibrated by staff electronics technicians prior to loading aboard the USS BADOENG STRAIT (CVE-116) for transportation to the Pacific Proving Ground.

The "workhorse" instrument for the operation was the AN/PDR-27F with the AN/PDR-18A available for use in higher radiation fields. These instruments were very satisfactory and gave essentially trouble free service throughout the operation. By relying principally on these instruments, the logistics of spare parts, tubes, batteries, and maintenance was greatly simplified. Instruments were issued and repaired by staff electronic technicians on the BADOENG STRAIT. For planning purposes in future operations, the repairs accomplished during Operation REDWING after the initial work at NRDL are described in Appendix B. Ships and units were required to effect all radiac repairs within their capacity.

The requirement for procurement of a pool of radiac spare parts, tubes, batteries, and tools was placed on the BADOENG STRAIT with funding to be done by BuShips. This worked out satisfactorily, although some materials were not received until late in the operation. All ships and units were advised to procure 200 percent spare tubes and 300 percent spare batteries, and to keep these batteries in cool storage (approximately 40°F). The electronic supply office was alerted on these abnormal requirements and fresh batteries were made available at West Coast issuing activities.

Radiac instrument allowances for the operation were established by request to BuShips for HMR-363 and Patrol Squadron ONE, and instruments were shipped directly to these units. In view of their remote location at Kwajalein during the operation, Patrol Squadron ONE was advised to be as self-sufficient as possible, and that qualified radiac repair electronic technicians should be trained at the U.S. Naval Schools Command. This recommendation was also made to all large ships.

Special instruments to supplement available Navy standard types were provided. Twenty Berkeley side window GM counters were obtained on loan from NRDL, for issue and use as personnel monitoring instruments. Twenty Cutie-Pies were ordered from ELTRONICS, funded by Commander Joint Task Force SEVEN, and issued for use in monitoring and evaluating high beta-gamma intensities. These latter instruments were not received until late in the operation and many were defective upon receipt from the manufacture. Seventy-five Bendix O-5r dosimeters and one charger were borrowed from Task Unit 7 (Radiological Safety Task Unit of TG 7.1) for use of Patrol Squadron ONE and for decontamination operations. Standard Navy dosimeters (IM-9/PD, IM-19/PD, IM-94/PD and the PP-354C charger) were used.

Radiation sources for instrument calibration and for training purposes were obtained from BuShips. These sources were received without calibration information and without individual containers for convenient use. Calibration was effected and lead "pigs" were fabricated in the forward area, but were not available in time to be used extensively. The use of actual sources, under close supervision, for monitoring drills appeared to be very effective. A seven curie Cesuim 137 source was also obtained on loan from NRDL for instrument calibration.

Casualty Range dosimeters (DT-60/PD) and the CP-95/PD readers were provided for all units. The issue of DT-60's to all personnel of Task Group 7.3 was recommended and accomplished. The initial reading, recording, and issue of these dosimeters presented no problems. Since no dosages in the casualty range were experienced during Operation REDWING, no further evaluation of their use was made.

The film badge dosimetry program for Joint Task Force SEVEN was a primary function of Task Unit 7 of Task Group 7.1. Film badges and associated record cards were obtained from Task Unit 7 and distributed to all ships and units of Task Group 7.3 together with instructions concerning issue, wearing, and executing record cards. Completed "Individual Exposure Record Cards" and "Film Envelopes" were collected and returned to Task Unit 7 to establish

central records. All personnel of Task Group 7.3 were issued "permanent" film badges. Completed serialized film badge cards were retained by the Radiological Safety Officer as a check on the complete return of all badges issued. New badges and serialized cards were issued about midway during the operation and exposed badges collected, checked and returned to Task Unit 7 for developing, evaluation, and dosage recording. Film badges were collected and processed about one week after the final shot. Accumulated dosages for all Task Group 7.3 personnel was reported by Task Unit 7 for forwarding to individual units of Task Group 7.3. Close supervision of film badge issue, accounting, and collection was time consuming but very necessary, due to numerous instances of improperly executed cards, lost film badges, transfer of personnel, and movements of ships. Film badges were also furnished to transient ships where indicated.

The established maximum permissible exposure (MPE) for Operation REDWING was 3.9r for any 13 week period. Dosage control was thus very critical, especially for HMR-363, boat pool, PATRON ONE, and personnel engaged in YAG and YFNB decontamination. "Mission" film badges were obtained from Task Unit 7 for such personnel using a "charge-a-plate" system. Accumulative dosage records were kept by all units to prevent overexposure of personnel. Dosage control records were also maintained by Task Unit 7. Reports of all exposures over 2.0r were made by Task Unit 7. To date, only one HMR-363, one YAG-40 and three boat pool enlisted men have radiation exposures in excess of 2.0r (all less than 2.5r), and one X-Ray technician from the BADOENG STRAIT has accumulated a dosage of about 5.0r from faulty X-Ray equipment.

#### 3.15.10 CONCLUSIONS

1. Available radiological safety preparations and countermeasures are not generally well understood and should be emphasized to units assigned by all possible means.

2. Coveralls, caps, and cotton or canvas gloves are satisfactory protective clothing for use in hot humid climates. Hooded rain jackets, trousers, rubber gloves, plastic face shields, and boots or overshoes are

satisfactory for wet decontamination work in such climate.

3. Washdown systems are a required countermeasure for all ships participating in nuclear test operations and can be very effective if properly employed.

4. Thorough cleaning of firemain and other salt water systems on ships operating in contaminated water would greatly reduce residual radiation hazards upon leaving contaminated areas. Periodic cleaning of firemain is mandatory if washdown systems are to operate effectively.

5. The AN/PDR-27F and AN/PDR-18A radiac instruments were very reliable and satisfactory for most needs, and should be extensively employed. Ship's radiac instrument allowance, however, do not have a suitable medium range beta-gamma instrument. Numbers of radiacs available to most ships are not adequate for nuclear test operations.

6. Procurement of radiac spares and batteries was satisfactory. Adequate supplies of fresh batteries prevented many of the instrument problems experienced on previous operations.

7. Small radiation sources are required for instrument calibration and training purposes aboard ships. Monitoring drills using actual sources appear to be very worthwhile.

8. The procedures followed in obtaining, distributing, wearing, and collecting film badges for all personnel in Task Group 7.3, and the recording and reporting of their accumulated dosages were satisfactory. Close supervision of this program is necessary if dosage records are to be complete and accurate, and such supervision is very time consuming. Dosage control procedures were very successful. More frequent reissue and reading of film badges is desirable since the high humidity resulted in water marking of all badges to a density equivalent to several hundred milli-roentgens. Reporting all dosages received on "permanent" badges during the operation, as well as for "mission" badges would provide for better dosage control.

9. The use of "strippable" coating to facilitate rapid decontamination of LCU's was unsuccessful due to technical problems in durability and

and strippability of the coating.

### 3.15.11 RECOMMENDATIONS

1. That continued emphasis be placed on radiological safety preparedness and available countermeasures for future operations.
2. That coveralls, cotton or canvas gloves, and utility caps be adopted as standard radiological safety protective clothing. That hooded rain jackets, trousers, boots or overshoes, rubber gloves, and plastic face shields be adopted as standard clothing for wet decontamination.
3. That washdown systems be required on all ships for nuclear test operations and for atomic defense, and that such systems should be further developed to provide permanent systems with an internal central control.
4. That firemain and other salt water systems be thoroughly cleaned on all ships prior to reporting for nuclear test operations, and that periodic cleaning be required on all ships as an atomic defense measure.
5. That procedures utilized for procurement, distribution, and maintenance of radiac instruments during Operation REDWING be followed for future operations.
6. That utilization of radiac types AN/PDR-27 and AN/PDR-18 as basic field instruments be continued.
7. That further development of standard Navy radiac instruments, particularly for alpha and beta detection and for personnel monitoring, be vigorously prosecuted.
8. That small radiation sources (such as several Cobalt 60 sources in the 5-100 millicurie range) be procured for instrument calibration and training aboard ships assigned to future operations.
9. That close supervision of the film badge program be required in future operations. That film badges be renewed at least monthly in hot, humid climates, or that more effective protection of film from heat and moisture be developed. That reports of accumulated dosage for all personnel be made available to units as frequently as possible during future operations.
10. That "strippable" coating not be used for future operations until durability and strippability is improved.

### 3.15.12 RADIOLOGICAL SAFETY OPERATIONS

During all major events, all ships were deployed at a distance of about 30 miles from shot site. This distance afforded complete protection from blast and shock, initial radiation, and thermal effects. No special clothing at shot time was required.

The only remaining shot time hazard was from the initial flash. Positive control of all personnel was established to insure that no one looked directly at the detonation during the first few seconds. Personnel of all ships and units were repeatedly indoctrinated in safe procedures for viewing the phenomena. Six hundred pair of high density (NX 5) goggles, having an optical density of 4.25, were obtained and distributed to all units. Despite these precautions two or three isolated instances of possible temporary eye injuries due to flash were reported where goggles were not worn. Safety and morale considerations indicate that a greater number of these goggles should be made available.

Countermeasures, including monitoring and decontamination operations aboard all ships were conducted during fall-out. These measures insured that only minimum exposures of personnel were incurred, even in the case of the only significant contamination on ships other than the fall-out collection group, on CURTISS, AINSWORTH, and KNUDSON when these ships were sent to Eniwetok after TEWA for possible evacuation. This, which included "hot spots" as high as 300 mr on CURTISS, was brought within tolerable limits by use of washdown scrubbing. No delay in operational clearance was required of any ship because of contamination. Monitoring and decontamination of P2V-5 aircraft and HRS-3 helicopters was accomplished on numerous occasions of moderate contamination. A commercial cleaning compound "Keolite" was very effective for cleaning aircraft engines. A canvas "bathtub" was successfully used on the BADOENG STRAIT to control the spread of contamination during helicopter decontamination. Contamination control, insofar as entrance and exit to the gas tight envelop of ships is concerned, prevented the spread of contamination into ship interiors.

For all of the later events at Bikini, the Radiological Safety Officer for Joint Task Force SEVEN remained at Eniwetok and the radiological situation,

from aircraft and helicopter surveys was furnished to CTG 7.3 and also relayed to CJTF-7 headquarters at Eniwetok by telephone, teletype, and radio. This procedure appears to have worked out very well.

Reentry into the lagoon was usually made at about  $H/2\frac{1}{2}$  hours. No samples of lagoon water prior to reentry were taken by survey helicopters or considered necessary. All ships were directed to take lagoon water samples at their anchorages for radiochemical analysis. Only slight contamination of the lagoon in the anchorage area was encountered during the operation. Boating and contamination of ship's hulls and salt water systems were not a problem although some salt water systems were contaminated on ships operating and anchoring near shot sites. It was not necessary to secure ships evaporators while at sea or in the Enyu anchorage area, although some ships did so as a precautionary measure. All ships were carefully advised on precautions to be taken when distilling potable water in contaminated areas and were instructed to have radiochemical analysis made periodically of potable water samples. Lagoon contamination made it necessary to prohibit swimming at Camp Blandy for several days following detonations at Bikini and finally for the remainder of the operation. This decision was based on the philosophy that exposure to radiological hazards should be kept to a minimum in the absence of reliable exposure criteria. Swimming was prohibited when radiation levels at one foot above the surface were greater than background or when contaminants were present in amounts greater than about 1 times 10 to the minus 5 microcuries per millileter, depending upon the age of the contaminants. It is probable that swimming could have been permitted more often if reliable criteria had been established by competent authority. Additional information on lagoon contamination was received from Scripps Institution of Oceanography personnel during the operation.

Personnel from the USS ESTES (AGC-12), USS BADOENG STRAIT (CVE-116) and USS CURTISS (AV-4) were detailed as decontamination teams in the decontamination of YAG-39, YAG-40, and LST-611 at Eniwetok following several Bikini shots. This required considerable coordination with ships concerned, Task Unit 7 and

and personnel from Projects 2.8, 2.9, and 2.10B of Program 2, including "on the spot" supervision by staff radiological personnel. Briefly the procedure was to send the required working parties and staff personnel from Bikini to Eniwetok on D/1 day, brief the working parties on D/2, and commence decontamination operations on D/3 using hosing and scrubbing and other special techniques. Although moderate contamination was experienced, these operations were successful in effecting required turn-around of ships for the next event. It is felt that participating personnel received valuable training and experience during these operations, and the above ships were encouraged to rotate their key damage control personnel in this assignment. Dosage received by decontamination party personnel averaged about 0.5r for each operation.

Decontamination of YFNB-13 and YFNB-29 was required after several of the Bikini events and was successfully accomplished by the fleet tugs, USS ABNAKE (ATF-96), USS LIPAN (ATF-85), and USS CHICKASAW (ATF-83). This requirement was not submitted to Task Group 7.3 until about the time of the first Bikini detonation, and inspection of the barges revealed unacceptable conditions of contamination susceptibility. As a temporary expedient the ABNAKI cleared topsides of loose gear, welded over topside holes and cut drain holes in the deck house on both barges. Additionally, a modified washdown system was installed on both barges. These washdown systems were inoperable for several events due to pump and generator failures. Later in the operation it became apparent that effective decontamination, of the order required to meet turn-around dates for the next scheduled shot, might not be feasible in view of the tenacious nature of "wet" contaminants experienced from barge shots on rusty topside surfaces. These were cleaned and painted by ships personnel.

Decontamination of the YFNB's by fleet tugs was effective in reducing initial intensities in the order of 500 mr/hr (on D/2) to fields in the order of 50 mr/hr, with no "removable" contamination remaining. Exposure of tug personnel was held to a maximum of 0.5r per event. On the basis of this experience the following three step shipboard decontamination procedures are

recommended:

1. Fire hosing, using 1½" hoses on solid stream with two men per hose.
2. Scrubbing and salt water flushing. A mixture of detergent and fresh water (or salt water detergent and salt water) together with vigorous scrubbing action should be used. As much lather as possible should be worked up. After scrubbing with the above, flush with salt water (1½" hose on "fog" position) and use vigorous scrubbing action to move the residue overboard, working with the drainage of the deck. (A team consisting of two men with brushes and one man with a hose worked out very satisfactorily for the flushing operation). The men with the brushes, should work ahead of the man with the hose. If the contamination is very tenacious, boiler compound and lye may be added to the detergent mixture and the resulting solution will actually remove the paint. This may be necessary for contamination that is "wet" and of small particle size.
3. Fire hosing, using 1½" hose on solid stream with two men per hose.

The above procedures should be applicable for all ships. Foul weather gear should be used as protective clothing. Complete dress-out should be used during steps 1 and 3. Boots, gloves, and trousers are sufficient for the scrubbing and flushing of step 2. Contamination that is not removed by the above procedures will require vigorous surface removal techniques (wet-sand blasting, etc.) if isolation and natural decay are not operationally acceptable. Such surface removal techniques are normally construed as a shipyard operation. However, it is believed that the above listed procedures can be successfully implemented by any ship's crew, and that proper application of these procedures should enable a ship to reduce any commonly encountered radiation levels to a degree that will permit it to carry out its mission without excessive radiological exposure of personnel.

The feasibility of an early radiological survey by fixed wing aircraft to provide a plot of radiation fields was investigated with P2V

aircraft on several of the later shots. Experience to date indicates that a fixed wing aircraft, flying at about 500 feet altitude, can obtain accurate and early information on the radiological situation. Only portable field type radiacs and a simple means of determining positions on a grid chart are required. A survey of the entire atoll and adjacent areas can be started immediately after local fall-out has ceased and can be completed with less than two hours flight time. This includes a complete mapping of radiation intensities from which iso-intensity contours for the entire atoll area may be determined. This would appear to be considerably more accurate, timely and complete than present surveys by helicopters, and consideration of this procedure for future operations is recommended.

All transient ships qualified for and were granted final clearances in accordance with NavMed P-1325. Most ships and aircraft qualified for a final clearance. Some ships were mildly contaminated and were granted an operational clearance. In such instances, every effort was made to spell out the extent of the residual contamination, the nature of the hazards to personnel involved, and recommended procedures for obtaining a final clearance. Letter or message reports were made to ships, type commanders, and other interested activities. In this connection, it is considered that NavMed P-1325 does not stipulate realistic criteria for such clearances and that a more workable set of numbers is needed for future clearance decisions.

### 3.15.13 CONCLUSIONS

1. All hands should be thoroughly indoctrinated in the precautions to take at shot time to protect them from the hazard of flash blindness.
2. Ships should set up positive procedures to be used by shipboard monitoring teams. The need for this and other fall-out countermeasures was apparent during Operation REDWING.
3. Canvas bathtubs assist in contamination control during helicopter decontamination, but are not essential. Use of hoses to provide a cover of water over the flight deck and an adequate deck drainage system will also control contamination during such decontamination operations. This procedure

is more readily available to all ships.

4. Decontamination procedures developed during Operation REDWING are considered to be practical and effective. They are adaptable to all shipboard contamination situations.

5. The Task Group 7.3 Radiological Safety Officer can coordinate the collection, evaluation, and dissemination of radiological safety information for Bikini events and keep CIG 7.3 and JTF-7 headquarters at Eniwetok adequately informed.

6. Procedures for taking salt and fresh water samples, with means available for analyzing contamination content of water, are required.

7. Ships can anchor and operate in the lagoon during conditions of moderate contamination. Boating in the lagoon is also feasible under these circumstances. Potable water can be made and used if simple precautions are taken and frequent checks are made. Contamination of ships salt water systems and ground tackle will occur and realistic countermeasures must be used.

8. Sufficient information and criteria are not available to properly evaluate the health hazard to personnel swimming in contaminated water. Swimming is an important recreation activity and should be permitted whenever possible.

9. Decontamination of ships and barges participating in the fall-out collection program can be successfully accomplished by personnel from the task force. This work provides excellent practical experience for the personnel involved.

10. Early radiological surveys of atoll and lagoon areas can be made using fixed wing aircraft (P2V-5) and standard field radiacs (AN/PDR-27 and AN/PDR-18). Intensities measured in the aircraft can be plotted on a simple grid reference chart and contaminated areas delineated.

11. To properly evaluate radiological hazards during the operation and to be able to properly assess action taken by participating units, reports are needed by the Staff Radiological Safety Officer.

12. The present directive governing radiological "clearances" for

ships and aircraft upon departure from the PPG (NavMed P-1325) is not realistic or workable. A proposed revision to NavMed P-1325, which has been in process for some time, is needed for future operations.

#### 3.15.14 RECOMMENDATIONS

1. That ships be advised of the action recommended to protect personnel from shot time hazards. In this connection a greater quantity of high density goggles are required for issue to ships.
2. That monitoring teams be given indoctrination to insure use of standard monitoring techniques. That other radiological safety techniques and countermeasures developed during Operation REDWING be adopted for future operations.
3. That adequate drainage to provide contamination control during decontamination of aircraft on carriers be provided. The use of a canvas bathtub may prove useful in accomplishing this objective, but is not considered to be essential.
4. That a radiochemical laboratory be provided to analyze water samples.
5. That a study be made by responsible agencies of the allowable contamination permissible for swimming in sea water.
6. That ships use regularly assigned decontamination teams to decontaminate any special target or test vessels during future operations.
7. That ship decontamination procedures developed during Operation REDWING be adopted as standard procedures.
8. That a study be made regarding the use of fixed wing aircraft for early lagoon radiological surveys and the plotting of iso-intensity lines, and that this capability be utilized in future operations.
9. That more realistic and workable criteria and procedures for radiological "clearance" to ships and aircraft be worked out with activities concerned and adopted for future operations.

## APPENDIX A

## RADIOLOGICAL SAFETY TRAINING

SHIP OR UNIT	DATE	NUMBER ATTENDEES	COURSE PRESENTED ON/AT
YAG-39, YAG-40, LST-611	2/8-9	95	Naval Radiological Defense Laboratory
Patrol Squadron ONE	2/27 to 3/2	322	U. S. Naval Air Station Whidbey Island, Washington
USS ESTES (AGC-12)	3/19 to 3/21	20	USS ESTES (AGC-12)
Staff CTG 7.3 & Officers USS ESTES (AGC-12)	3/26 to 3/30	30	USS ESTES (AGC-12)
USS LIPAN (ATF-85)	4/4 to 4/5	15	ENIWETOK (FRED)
USS CHICKASAW (ATF-83)	4/4 to 4/5	19	ENIWETOK (FRED)
USNS T-LST-306	4/10	20	USNS T-LST-306
Marine Helicopter Transport Squadron 363	4/16	42	USS BADOENG STRAIT (CVE-116)
USS KNUDSON (APD-101)	4/17	30	USS BADOENG STRAIT (CVE-116)
USS BADOENG STRAIT (CVE-116)	4/18 & 4/21	48	USS BADOENG STRAIT (CVE-116)
USS SILVERSTEIN (DE-534) USS MC GINTY (DE-365)	4/19	17 16	USS BADOENG STRAIT (CVE-116)
CTG 7.3 BOAT POOL BIKINI	4/20	34	USS BADOENG STRAIT (CVE-116)
USS SIOUX (ATF-75)	4/23	15	USS BADOENG STRAIT (CVE-116)
USS CHICKASAW (ATF-83)	4/23	10	USS BADOENG STRAIT (CVE-116)
USS CATAMOUNT (LSD-17)	4/24	36	USS BADOENG STRAIT (CVE-116)
USS ABNAKI (ATF-96)	4/26	15	USS BADOENG STRAIT (CVE-116)
USS SILVERSTEIN (DE-534)	4/26	19	USS BADOENG STRAIT (CVE-116)
USS CURTISS (AV-4)	4/30	35	USS CURTISS (AV-4)
Marine Helicopter Transport Squadron 363	5/3	18	USS BADOENG STRAIT (CVE-116)
USS BADOENG STRAIT (CVE-116)	5/3	21	USS BADOENG STRAIT (CVE-116)
USNS FRED C. AINSWORTH (T-AP-181)	5/4 & 5/7	28	USNS FRED C. AINSWORTH (T-AP-181)
USS SHELTON (DD-790)	5/8 & 5/15	25	USNS FRED C. AINSWORTH (T-AP-181)
USS JAMES E. KYES (DD-787)	6/28 & 6/29	30	U. S. Naval Station, KWAJALEIN
U. S. NAVAL STATION KWAJALEIN	7/5 & 7/6	55	U. S. Naval Station, KWAJALEIN
		Total 1036	

## APPENDIX B

## REQUIRED RADIAC REPAIRS

TYPE	SHIP	TROUBLE	CURE
AN/PDR-27C	LIPAN	No meter reading	Replaced C-101 and V-103
AN/PDR-27C	ESTES	No meter reading	Replaced C-101, C-107, C-108, and V-103
AN/PDR-27C	ESTES	No meter reading	Replaced batteries, V-103, and V-101
AN/PDR-27C	ESTES	Meter pegs to right Audio note in headset	Replaced C-107, C-105, C-104, C-106, C-101, CR-101, batteries
AN/PDR-27C	ESTES	Calibration	Calibrated
AN/PDR-27C	ESTES	Calibration	Calibrated
AN/PDR-27C	ESTES	Calibration	Calibrated
AN/PDR-27C	ESTES	No meter reading	Replaced C-107, C-108
AN/PDR-27C	ESTES	Meter pegs to right	Replaced batteries, cleaned battery box
AN/PDR-27C	LIPAN	No meter reading	Replaced C-101
AN/PDR-27C	ESTES	No meter reading	Replaced C-101, C-107, V-101, V-103
AN/PDR-27C	LIPAN	No meter reading	Meter movement open, no spares available
AN/PDR-27E	BADOENG STRAIT	No reading on .5 & 5 mr/hr scale	Replaced batteries, V-102, V-103
AN/PDR-27E	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27E	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27E	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27E	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27F	HMR-363	No meter reading	Replaced V-103, V-101, batteries
AN/PDR-27F	ABNAKI	No meter reading	Broken battery clip on BT-107
AN/PDR-27F	Boat Pool	No meter reading	Replaced V-101, V-103
AN/PDR-27F	HMR-363	No meter reading	Replaced V-103, batteries

APPENDIX B (CONT'D)

TYPE	SHIP	TROUBLE	CURE
AN/PDR-27F	T-LST-618	No meter reading	Replaced batteries
AN/PDR-27F	BADOENG STRAIT	No reading on low scales	Probe wire open - no replacement port
AN/PDR-27F	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27F	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27F	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27F	KNUDSON	No reading on low scales	Replaced V-102
AN/PDR-27F	BADOENG STRAIT	Calibration	Calibrated
AN PDR-27F	T-LST-618	No reading on low scales	Replaced batteries, V-102
AN/PDR-27F	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27F	BOAT POOL	Meter will not ZERO	Adjusted mechanical ZERO on meter
AN/PDR-27F	BOAT POOL	No reading	Replaced batteries
AN/PDR-27F	BADOENG STRAIT	Calibration	Calibrated
AN/PDR-27F	ESTES	Calibration	Calibrated
AN/PDR-18A	HMR-363	Meter pegs to right	Replaced E-104, V-101, V-102
AN/PDR-18A	BOAT POOL	Will not ZERO	Replaced V-101, V-102
AN/PDR-18A	LCU-974	No meter reading	Replaced V-102
AN/PDR-18A	LCU-974	No meter reading	Replaced V-101, V-102, batteries
AN/PDR-18A	ABNAKI	Will not calibrate	Adjusted high voltage
CP-95/PD	T-LST-618	Will not calibrate	Adjusted internal calibrate control
CP-3D/PD	ESTES	No meter reading	Replaced broken probe and electrometer tube
AN/PDR-10B	ESTES	Meter pegs to right	Chamber arcing - could not repair

APPENDIX B (CONT'D)

TYPE	SHIP	TROUBLE	CURE
AN/PDR-10D	LIPAN	No meter reading	Replaced C-105, C-106, C-101
BERKLEY	SHELTON	No meter reading	Replaced batteries
AN/PDR-8B	MC GINTY	No reading on low scales	Replaced BS-101 tube
AN/PDR-8B	LIPAN	No meter reading	Replaced 1U5
AN/PDR-8B	LIPAN	No meter reading	Replaced 1U5, 3A5, BS-2
IM-4/PD	ESTES	Eratic - broken window	Replaced window, cleaned instrument
IM-4/PD	ESTES	Eratic	Cleaned instrument
IM-4/PD	ESTES	Eratic - broken window	Replaced window, cleaned instrument
IM-4/PD	ESTES	Eratic	Cleaned instrument

- NOTE:
1. All instruments were calibrated after repairs.
  2. This does not include numerous replacements of battery clips.
  3. Failure of condensers C-101, C-107, and C-108 was the most frequent trouble with AN/PDR-27F instruments.
  4. This listing does not include work on dosimeters and special instruments such as Cutie-Pies, which were received with defective wiring and meters.

## SECTION 4

### LOGISTICS

#### 4.1 PLANNING PERIOD

The Logistics Section of Commander Task Group 7.3 consisted of one Commander, Supply Corps, U.S. Navy, one Storekeeper Second Class, U.S. Navy and one Yeoman First Class, U.S. Navy until the middle of November 1955 when this section belatedly filled its final allowance of two additional Commanders, U.S. Navy as Logistics Officer and Ship's Maintenance and Repair Officer. Two additional Storekeepers First Class were received in February 1956 for utilization during the operational period in the Pacific Proving Ground.

Major projects during the preoperation period from mid-November to mid-March included:

1. Detailed coordination with Commander Joint Task Force SEVEN and Chief, Bureau of Ships in arranging the details of authorization of funds and approval of work to be accomplished on ships assigned to the task groups.
2. Coordination with the Naval Shipyards, Type Commanders and Commanding Officers of individual ships for disseminating technical information concerning installation details and for arranging shipyard availabilities. Close liaison by letter and telephone was needed with the task group originating requirements in order to insure that the installation was proceeding in accordance with operational requirements and that the material might arrive in time to ensure completion during the restricted availability assigned.
3. Study and gathering of information from many sources and particularly reports of Operation CASTLE and Commander Joint Task Force SEVEN Planning Directive in order to complete the annexes of the operation plan on logistics, surface transportation, boat pool and evacuation.
4. Estimating, budgeting, and maintaining the records and accounts of funds for travel and per diem.
5. Arranging procedures for wardroom messing and reimbursement.
6. Formulating roll-up procedures in order to insure detailed accounting of all material received on loan from the various services and material

bureaus, and of material purchased with JTF-7 funds.

#### 4.2 SHIP INSTALLATIONS

In order for the various participating projects to prepare for Operation REDWING, it was necessary for certain ship installations to be made. For a complete listing of ship installations see below. The fact that these ship installations were accomplished as well as they were is largely due to the full and enthusiastic cooperation and support of the ships, type commanders, installing activities and project personnel, rather than careful preplanning on the part of activities concerned.

All ships participating in Operation REDWING were fitted with interim washdown system furnished by the Bureau of Ships. This system consisted of plastic piping with properly located nozzles, which when connected to the firemain system, covers the ship with a spray, and washes any radio active fall-out over the side before it has an opportunity to stick to paint or metal. The Bureau of Ships provided the materials, furnished technical assistance in layout, and supervised the installations. Small ships were able to make their own installation, while larger ships required shipyard assistance because of the extensive nature of the work. Some of the last installations were made in the Pacific Proving Ground, but were completed prior to CHEROKEE, the first Operation REDWING detonation. Clean firemain pressure were essential to the proper operation of this system. Low firemain pressure at high stations in the ship does not produce a proper spray.

All ships participating in Operation REDWING received two sets of AN/FRC-27 (or AN/TRC-34) which were used as primary tactical and primary administrative circuits. These sets were distributed by the boat pool, Coronado for installation by ship's force. These should have been installed by a shipyard in order to properly situate the antennas and make the optimum cable runs. Some equipments were not delivered to the ships until they arrived in the Pacific Proving Ground and then a hurried installation had to be made.

Other ship installations are summarized below:

1. USS ESTES (AGC-12)

- a. Installation of twin single sideband transmitter (T-276) and receiver AN/FRR-40 with CF-1A and AN/FCC-3 terminal equipment.
- b. Installation of AN/TRC-22 transceiver for medium range VHF ship to shore.
- c. Installation of additional teletype machines.
- d. Installation of AFSAY 808 with AN/GRC-27 equipment.
- e. Modification of flag communications space to accommodate Program 2 Plot.
- f. Installation of VK-5 Radar Repeater in Flag Plot.
- g. Installation of AN/SPA-4A on open Flag Bridge.
- h. Installation of Sigtot-Sampson in crypto.
- i. Installation of personnel decontamination station in vicinity of helicopter deck.
- j. Installation of new rugs and furnishings for flag quarters.
- k. Installation of 10 watt Motorola transceivers for RadlSafe and Pogo Nets.
- l. Installation of AN/TRC-3 transceivers for ship to ship link, including 6 disccone antennas.
- m. Installation of two 150 cubic feet walk-in refrigerators, with motor generator.
- n. Extension of IFF to all air Radar Repeaters in CIC.
2. USS CURTISS (AV-4)
  - a. Installation of freezer in pyrotechnic locker.
  - b. Installation of AN/TRC-3 transceivers, including 6 disccone antennas, AN/TCC-3 terminal equipment.
  - c. Installation of Sigtot-Sampson equipment.
  - d. Installation of timing and firing station in former radio central.
  - e. Relocation of equipment from Radio Central to new space immediately aft.
  - f. Installation of decontamination station.

g. Installation of 10 watt Motorola equipment for Pogo and RadlSafe Nets.

3. USS CATAMOUNT (LSD-17)

a. Installation of additional diesel oil storage capacity for fueling boat pool craft.

b. Installation of DeLaval Purifier for diesel oil delivery system.

c. Removed helicopter deck.

d. Removed lower mezzanine deck and vehicle ramps.

e. Installation of two portable reefers with motor generator set.

4. USS BADOENG STRAIT (CVE-116)

a. Installation of Raydist trailers and antennas.

b. Installation of personnel decontamination station.

c. Installation of television transmitter and studio equipment in after ready room.

d. Installation of AN/TRC-3 equipment with terminal bays.

e. Installation of 10 watt Motorola transceivers in forward ready room for Pogo, operations, NCRL and RadlSafe Nets.

f. Installation of radiac instrument repair facility.

5. USNS FRED C. AINSWORTH (T-AP-181)

a. Installation of photo-dosimetry and radlchem trailers on deck.

b. Installation of manual telephone switchboard and telephone system in various spaces.

c. Installation of teletype facilities.

d. Installation of AN/TRC-3 equipment with terminal bays.

e. Installation of 10 watt Motorola transceivers for Commander Task Group 7.1 Scientific (Pogo), operations, UCRL, RadlSafe Nets.

f. Installation of VRC-18 for TU3.

g. Accommodation ladder with pontoon footing.

h. Electricity and salt water facilities for RadlSafe barge alongside.

i. Various modifications to staterooms and other spaces to fit them

for office use.

- j. Electronic workshop facilities.
  - k. Installation of fueling at sea rig.
  - l. Installation of special motor generators and transformers for AC power required for photo-dosimetry and RadChem trailers.
6. USS SHELTON (DD-790) AND USS JAMES E. KYES (DD-787)
- a. Installation of LOKI rocket launcher on 5" mount No. 3.
  - b. Installation of modification to Mk 1 computer to increase accuracy in tracking slow moving targets at long ranges. (Window shells for wind observations.)
  - c. Special stowage for 16 helium cylinders.
7. USS MC GINTY (DE-365) AND USS SILVERSTEIN (DE-534)
- a. Installation of special boom, winch, motor and monitor for sea water studies for Scripps Institution of Oceanography.
  - b. MC GINTY drydocked and given complete bottom cleaning and re-painting.
  - c. Two OC-3/S bathythermographs for each ship.
8. USS WALTON (DE-361)
- The following installations were made at Eniwetok:
- a. Tank for scintillation counter.
  - b. Plastic chemical pump.
  - c. Plastic and neoprene piping to the tank.
  - d. Muffle furnace.
  - e. Winch for plankton net.
  - f. Davit, fairleads and service platform at deck edge.
  - g. Laboratory tables with electrical outlets.
9. USS KNUDSON (APD-101)
- a. Installation of telemetering receivers, antennas and recorders.
10. USS MOUNT MCKINLEY (AGC-7)
- a. Installation of personnel decontamination station.
  - b. Installation of TBA transmitter.

c. Installation of two AN/FGC-5 multiplex equipments, complete with terminal gear.

d. Installation of one RCA Internation ET 11 Transmitter.

11. USS SIOUX (ATF-75)

a. Special skiff handling booms, winch, tackle, including removal of 40 MM mounts aft and removal of sections of bulkwarks on fantail.

b. Installation of AN/UQN-1B deep sounding fathometer.

12. M/V HORIZON

a. Special installations as required by Scripps Institution of Oceanography were accomplished by them.

13. USS GEORGE EASTMAN (YAG-39) AND USS GRANVILLE S. HALL (YAG-40)

a. Installation of other special experimental equipment was made under direction of U.S. Naval Radiological Defense Laboratory and Bureau of Ships.

14. USS CROOK COUNTY (LST-611)

a. Installation of other special experimental equipment was made under the direction of U.S. Naval Radiological Defense Laboratory and Bureau of Ships.

"Late requirements" seemed to be the rule rather than the exception. Most ships had an availability at a shipyard, a repair facility, or alongside a tender prior to deployment. The purpose was two-fold. First was to put ships in the best material condition possible, within financial limits imposed by the type commander, and second was to perform any shipyard work necessary to fit the ships for their special project roles.

As has been mentioned above, many project requirements came in late, some becoming firm only after a ship's availability had been completed. This required the type commander to reschedule an additional availability for the installation of special REDWING equipments, which of course, disrupted operating schedules, ran up costs and contributed to less than optimum accomplishment of the desired ends. No cut-off date for submitting requirements for ship installations was ever established, regardless of how desirable it may

have been to orderly installation. New demands continued to trickle in throughout the ship's availability and subsequent thereto. The only solution was to authorize unlimited overtime while the availability continued (a very expensive process). Witness the USS CURTISS (AV-4) availability at Long Beach where costs jumped from an estimated \$98,000 to a final \$155,000, due largely to late requirements and overtime. As a consequence, Commander Joint Task Force SEVEN Comptroller reviewed revised cost estimates with alarm.

Some of these late requirement resulted in shipyards missing completion dates, or accepting work only on a "Recomp" basis (shipyard setting own recommended completion date after the end comes in sight), until the situation clarified.

A contributing factor to the lack of coordinated approach was the fact that there was no Material and Maintenance member assigned to Commander Task Group 7.3 staff until mid-November, at which time most availabilities were already underway. This hindered early planning and firm control of availabilities and ship installations by CTG 7.3.

The routine for obtaining approval and authority to proceed with installation work was cumbersome and will require streamlining for future operations of this nature. Commander Joint Task Force SEVEN would pass a requirement originated by one of the task groups (usually CTG 7.1 or one of its subordinate agencies) to CTG 7.3 to accomplish, but then would frequently withhold authority to expend funds for immediate commencement of the work until an estimate was furnished by the performing activity for CJTF-7 approval and fund reservation. Since naval shipyards and repair facilities cannot do preliminary design studies or estimates until an availability is granted and an account established to receive the charges for these services, an automatic and time consuming stumbling block was always present. As time grew short, this process was somewhat relaxed and CJTF-7 would approve work in advance of estimates. However, some work was turned down on the basis of cost alone (cleaning of firemain on DE's for example) which prevented firm plans from being made at an early date.

Too much of the installation work was done on the strength of a phone call, an advance copy of a letter or other nonofficial methods. This resulted in too many "crash programs," which could have been prevented with proper planning.

Some installations were not made until ships reached the Pacific Proving Ground (such as installation of some AN/FRC-27 AN/TRC-34 radio equipments, the USS WALTON (DE-361) sea survey equipment, USS CURTISS (AV-4) storm avoidance radar, etc.). This was done because, in some instances, the equipment was not available for installation until the ships were already deployed, and in other instances, the jobs were considered to be minor. This resulted in complex freight movement to the forward area, placed an additional burden on ship's forces and was not the most desirable procedure to follow.

#### 4.2.1 CONCLUSION

1. There is much room for improvement in the area of planning for ships installations for an operation of this type.

#### 4.2.2 RECOMMENDATIONS

1. That the Material and Maintenance Officer be made a member of the permanent staff, to remain with CTG 7.3 throughout the planning phase as well as the operational phase, in order that he may effectively coordinate the planning for ship installations and insure that installations are performed at minimum costs.

2. That participating ships be nominated far enough in advance of the operational phase to permit orderly planning.

3. That CTG 7.3 staff members in a group (Operations, Communications, RadlSafe, and Material) visit the task groups or other agencies who generate requirements for ship installations, to discuss fully these requirements, to understand the problem to be solved, and to submit recommendations as to how these requirements can best be solved on board ship. This may prevent later problems, such as, large requirements for AC power being placed on a DC powered ship, as was done in the case of the USNS FRED C. AINSWORTH.

4. That predeployment availabilities of participating ships be established by type commanders far enough in advance to permit orderly

planning.

5. Armed with the dates established in paragraph 4 above, that CTG 7.3 notify all task groups and other agencies making installation requirements of a cut-off date by which requirements must be submitted to CJTF-7. This date is recommended to be 60 days before commencement of the availability. Assuming one week for mail to travel from CJTF-7 to CTG 7.3 and one week from CTG 7.3 to the installing activity, this puts the total requirements in the hands of the shipyard by availability minus 45 days, a period considered adequate for shipyard planning and estimating.

6. That about 30 days prior to commencement of the shipyard availability, the Staff Maintenance Officer visit the shipyard to discuss fully all aspects of the installation. This visit would bring to the surface problems or questions concerning the installation which can then be resolved by the Maintenance Officer and the agency placing the requirement.

7. That the Maintenance Officer and a representative from the most interested activity which will use the ship during the operation, attend the arrival conference at the beginning of the availability, in order to settle all remaining questions.

8. That when CJTF-7 forwards approved requirements from some other task group, authority to proceed and to expend funds be included. This will streamline the process and save much time.

9. That CTG 7.3 be authorized to submit work requests direct to the performing agency, instead of via CJTF-7, BuShips and type commander.

10. That BuShips and type commanders be kept fully informed of intentions to make each ship installation, and that where necessary, approval be obtained in advance of all work.

11. That installation work not be forced onto ship's force on the basis of the fact that it is a small job. A ship's company has many problems of their own prior to a deployment, and should not be asked to shoulder problems of others. This point was strongly voiced by type commanders and strongly concurred in by this staff.

12. That where an installation in the forward area is actually necessary, such as the sea survey gear on the USS WALTON (DE-361), all installation materials be provided by the requiring agency, down to the last piece of pipe and cable, in order that the installation then becomes merely an assembly.

13. That careful planning for the installation of equipment will lead to simplified removal during roll-up. An estimate for removal can be made at the time installation is done.

14. That service craft requirements initiated by project personnel be reviewed by CTG 7.3 from an operational point of view.

#### 4.3 SUPPLY OF FORCES

At the request of Commander Task Group 7.3 authority was granted by the Bureau of Supplies and Accounts to all ships participating in Operation REDWING for an increase in the ration allowance of 25 percent. This request was initiated because of the lengthy duration of the operation, the tropical climate, and the remoteness of the units from any liberty post. It was expected that an increase in the quality of food served would be beneficial to morale.

The need for stocking supplies for an operation of 120 days was set forth in the Operation Plan and in a letter to ships preceding the publishing of the Operation Plan. Special items of high usage rate were listed in order that ample quantities of these items could be ordered. Included in this category were housekeeping items, shoes, decontamination gear, electronic spare parts, ship's store items, coca cola, small stores. Authority was granted to increase ship's store purchases 100 percent.

Commander Task Group 7.3 was intensely interested in maintaining a high morale of the forces under his command, and as a consequence correspondence was initiated with Commander Service Force, U.S. Pacific Fleet and the Bureau of Supplies and Accounts in order that foreign merchandise could be requisitioned by participating naval units from the Naval Purchasing Agents at Hong Kong and Yokosuka. This authority was granted.

Plans were finalized with ComServPac for provisions to be requisitioned

from the Naval Supply Center, Pearl Harbor, T.H. A Mid-Pac Support Schedule was published and included in the Operation Plan; this schedule showed the AF (Reefer Ship) departure and arrival times. Ships were directed to place orders with the Naval Supply Center, Pearl Harbor 30 days prior to loading of the AF in Pearl Harbor. A visit every three weeks was scheduled.

Arrangements were made by ComSerFor for an AO (Oil Tanker) to participate with the Operation REDWING forces. A period of from 4-6 weeks was designated for each AO. Periods between the departure of one AO and the arrival of the next AO would average about 6 days. The AO was to be loaded with 15M DBLS of AvGas, 15M DBLS diesel and NSFO to draft about 80M DBLS. Underway fueling from the AO was planned, because of the rough weather conditions expected in Bikini Lagoon. In addition to the AO, plans were made for a YON (Fuel Oil Barge) to be stationed at Eniwetok. The YON would be available for more frequent fueling of the smaller units designated for security and weather duties in that area. In addition the YON would be available in the event that the AO was required unexpectedly elsewhere.

In order to support the television installation in the USS BADOENG STRAIT (CVE-116) arrangements were made with Office of Armed Forces Information and Education, Department of Defense for the television films to be routed weekly to Eniwetok. Onward distribution to the television station operated by CTG 7.5 at Eniwetok was then to be made by the Commanding Officer, USS BADOENG STRAIT (CVE-116).

For general cargo and spare parts, all ship requirements were to be requisitioned from Naval Supply Center, Pearl Harbor. Naval Supply Center, Pearl Harbor would forward any requisitions that it could not fill to Continental U.S. An AK (Cargo Ship) was planned to leave Pearl Harbor for Eniwetok at six week intervals and stop at the Pacific Proving Ground, if cargo requirements warranted. In addition, priority cargo would be placed on frequent MATS flights scheduled to the Pacific Proving Ground. The Majority of general cargo was to be received in the Reefer Ship (AF)

Certain special equipments were required for support of the operation as follows:

1. Three portable 750 cu. ft. reefers and generators were obtained on loan from the Bureau of Yards and Docks, for installation in the Navy recreation areas at Enyu and Japtan Islands.

2. Mooring buoys, anchors, and cable were obtained from the Bureau of Yards and Docks for mooring boat pool LCU's and LCM's.

3. Seaplane mooring buoys, anchors, and cable were obtained from the Bureau of Aeronautics for installation at various weather islands. Planting and survey was to be accomplished by the USS CATAMOUNT (LSD-17) and the U.S. Naval Station, Kwajalein.

4. Balloons, reflectors, and theodolite equipments were obtained for use in the USS CROOK COUNTY (LST-611) in the event that soundings were required from this ship.

5. About 400 cylinders of helium were ordered for use by the DD's in taking weather soundings. 600 additional were ordered at a later date.

6. The USS CURTISS (AV-4) and ComAirPac requisitioned large supplies of helium, balloons, and reflectors for use by the USS CURTISS (AV-4) as "Weather Ship."

7. A large supply of "window projectiles" were obtained from the Naval Ammunition Depot, Oahu, T.H. for use by the DD's.

8. Arrangements were made with the Office of Naval Research for supplying "LOKI Rockets" to the two DD's for high altitude soundings.

9. Additional portable reefers of about 150 cu. ft. capacity were ordered for use by the Task Group 7.3 Boat Pool.

10. Arrangements were made for Class "X" clothing to be drawn from the Army Supply Depot Eniwetok for the RadSafe decontamination parties used in the YAG's, LST-611, and YFNB's.

11. Office equipment and flag allowance material was obtained from ComPhibPac and the USS ESTES (AGC-12) for use in the ESTES as flagship.

Plans were made for billeting the personnel of CTG 7.3 Representative, Eniwetok ashore on Parry Island. These requirements were forwarded to CJTF-7. An officer allocation of three "three man" rooms and two "six man" rooms was

received. In addition 23 tents, each with 10 bunks were allocated for enlisted personnel.

#### 4.3.1 CONCLUSION

The planning was adequate and suffered only in the brief amount of time given the Logistics Section to familiarize themselves with the operation, coordinate the program and conduct adequate follow-up with individual ships and units.

#### 4.3.2 RECOMMENDATION

The Logistics Section should be completely staffed during the interim period with a logistics officer and a supply coprs officer, so that plans can be made and carried out in an orderly manner.

#### 4.4 FINANCE

Allotments were granted to CTG 7.3 by CJTF-7 to cover the estimated quarterly costs of per diem and travel. Additional funds were also obtained for the repair of small craft. Appropriation data for transportation of special JTF-7 equipment was obtained from CJTF-7, whenever required.

The Department of Defense (DOD) memorandum quoted in CJTF-7 Administrative Order 1-56 set forth the basic policy for funding the costs of the operation.

Certain costs such as installation of equipments for Operation REDWING and restoration to original configuration were funded by CJTF-7. All equipments for the operation were obtained on a "loan basis."

All costs for consumables, spare parts (except those obtained in equipment kits), and fuel, were to be borne by the Services. Neither bureau personnel or type commanders were fully familiar with the Department of Defense directive setting forth the policy for bearing the costs of the operation. A conference was finally held with the Bureau of Supplies and Accounts and the Bureau of Ships personnel to determine responsibility for certain costs.

Stocking of the following items created considerable expense on the type or administrative commanders. In some cases, advances in quarterly

allotments were made, and in other cases an augmentation of funds was granted.

1. One hundred percent allowance of electronic spares plus additional high usage rate items. Magnetrons for the MK 25 radars used for weather tracking are an example of an expensive item of high usage rate.

2. Engineering maintenance parts and equipment to support the unit for six months while remote from tender or shipyard facilities.

3. Flag allowance equipment and administrative supplies for the USS ESTES (AGC-12).

4. General mess and wardroom mess gear and linens etc., to accommodate evacuees during shot days, or during emergency evacuation.

5. Housekeeping gear such as buckets, detergents, rags, brooms, swabs to use when ships are contaminated. This gear was also to be used for decontaminating the YFNB's and LCU's and barges when required.

6. Helium supply for the USS CURTISS (AV-4).

7. Lines, fenders, etc., used by the ATF's (Fleet Tugs) in mooring and unmooring, towing, and decontaminating service craft.

8. Barracks and office space rehabilitation at U.S. Naval Station, Kwajalein.

9. Special availabilities granted to ships by type commanders in order to ready them for the lengthy operation.

#### 4.4.1 CONCLUSION

Operations of this nature require increased funds well above that normally granted in a ship's quarterly allotment. This expense had not been fully expected by the ship or type commander.

#### 4.4.2 RECOMMENDATIONS

1. During the interim periods type commanders should be contacted early in order that expected expenses may be budgeted.

2. Construction requirements at U.S. Naval Station, Kwajalein should be anticipated at an early date.

#### 4.5 WARDROOM MESSING FOR TASK FORCE PERSONNEL

The procedure and forms utilized for wardroom messing and reimbursement

of task force personnel was incorporated in CTG 7.3 Instruction 4061.1 of 5 March 1956. The purpose of this instruction was to provide for high quality and sufficient quantity of food served during the specific periods when large groups of task force personnel were placed aboard the ships. A daily price of \$1.75 was authorized.

The majority of personnel evacuated aboard naval units were ordinarily subsisted ashore in the AEC contractor's mess. The procedure evolved, therefore, was for each person to sign for each meal served aboard ship in the wardroom messes. At the end of each month the wardroom mess treasurer would request payment for the meals served to personnel who normally subsisted ashore in Holmes and Narver messes. Visitors from Continental U.S. or officers and civilians who normally subsisted in the CTG 7.2 mess at Eniwetok were required to pay cash for each meal.

Since the CJTF-7 contract with Military Sea Transportation Service included meals for passengers the money collected from passengers aboard the USNS FRED C. AINSWORTH (T-AP-181) was to be turned over to CJTF-7 as a credit.

#### 4.6 OPERATIONAL PERIOD

The supply of forces for Task Group 7.3 during the operational period was entirely adequate. Priority shipment of spare parts by MATS from Naval Supply Center, Pearl Harbor was prompt. Fresh provisions particularly when export packed were in good condition.

Although no major repair facilities existed in the Pacific Proving Ground and regularly scheduled maintenance periods could not be scheduled for units, ships were able to maintain themselves in proper operating condition.

The recreation facilities established by CTG 7.3 were very beneficial to morale. The TV installation was enjoyed by the smaller units. Its benefits were lessened in some ships because of the warm humid climate. The "Ham" Station inaugurated late in the operation by the Commanding Officer, USS BADOENG STRAIT (CVE-116) received tremendous ovation. Trips to Kwajalein and Eniwetok were enjoyed by all participating units. Morale was maintained at a high order.

#### 4.7 SUPPLY OF FORCES

##### 4.7.1 REPLENISHMENT BY AF'S

Replenishment of fleet operating units attached Operation REDWING forces was accomplished by the USS MERAPI and USS KARIN. Runs between Pearl Harbor and the Pacific Proving Ground were accomplished at about three week periods. U.S. Naval Station, Kwajalein was also visited by the same ships after departure from the Pacific Proving Ground.

The following procedures were adopted as most efficient:

##### 1. AT BIKINI

- a. Unloading was accomplished by use of 6-9 LCM's supplied by the Task Group 7.3 Boat Pool.
- b. Hold working parties were supplied by SOPA(Admin) on an 8 hour shift basis. Each ship contributed to the working party -- no matter which ship's stores were being unloaded.
- c. Winchmen and hatch captains from CTG 7.5, Eniwetok were used during daytime working hours provided no cargo ships were present at Eniwetok; AF winchmen and hatch captains were used during night working hours.
- d. A liaison officer from SOPA(Admin) coordinated the unloading plan with ship's officers.

##### 2. AT ENIWETOK

- a. The AF upon entering proceeded alongside of the new cargo pier.
- b. Stevedoring was accomplished by CTG 7.5 stevedores.
- c. Stores and provisions for CTG 7.2 (Army) were unloaded simultaneously with CTG 7.5 provisions. Army provisions were placed in either a barge or trucks. In either case about two hours was required to transport the trucks and barges to Eniwetok Island before the trucks and barges were available for more provisions. As a consequence, handling of Army provisions is a time consuming effort and keeps hatches open for long periods of time.
- d. The small amount of fleet provisions required for the one or two ships at Eniwetok was no problem. Provisions were loaded into LCM's on "off side" of pier at any convenient time.

e. Provisions for the T-LST's, if not present, were stored in Holmes and Narver reefers.

f. General cargo was sent to Holmes and Narver, shipping and receiving for segregation and onward routing to ships or other task groups.

The AF unloading at Eniwetok usually required 2½ days. Unloading continued until midnight. At Bikini 1-2 days sufficed for completion. Except for one occasion when four ships at Eniwetok were scheduled for unloading at the one pier available, the AF was not delayed. Sundays were included among the working days.

The quality of provisions received was excellent. Export pack was used for most items. In order to prevent breakage, pallets were used in place of cargo nets.

The YAG's and LST-611 ordered relatively few provisions because the majority of their personnel subsisted ashore. In addition their power plants are shut down during decontamination periods; any fresh or frozen provisions would have spoiled.

#### 4.7.2 CONCLUSIONS

1. A three week period between replenishments is ample.
2. The lack of a deep water pier for Eniwetok Island causes undue handling of stores at considerable expense of manpower, transportation and time.
3. The methods employed in unloading were efficient and expeditious.
4. Twenty-four hour unloading operations at Bikini is not necessary unless a conflict arises in "beating the shot schedule." A 16 hour working day would benefit the working parties and lessen chances of an accident due to fatigue.

#### 4.7.3 RECOMMENDATIONS

1. The same procedure and schedule be utilized for future operations.
2. That a deep water pier be constructed at Eniwetok; if a pier is not feasible then a causeway should be constructed on the reef between Parry Island and Eniwetok Island in order to facilitate handling of stores and

provisions by truck.

3. In the event that MSTs ships are employed for provisions and cargo in future operations the procedure for handling "fleet issue" cargo direct to ships be well organized and understood in order to comply with MSTs regulations.

#### 4.7.4 POL

An AO was rotated in the Pacific Proving Ground at about six week intervals. A void period of about 7 days existed between departure of one AO and arrival of another.

Task Group 7.3 requirements from each AO consisted of 12M BBLs diesel oil, 2M BBLs AvGas 145/160 and 50-70 M BBLs NSFO for each six week period.

In order to reduce the number of AOG trips by SUBAREAPETOFF to Bikini, arrangements were made by CTG 7.3 for the AO to furnish diesel oil and AvGas to the POL barge at Bikini. This POL barge was used by CTG 7.5 shore facilities and the helicopter squadron. When only U.S. Marine helicopters were involved, the AvGas was furnished by the CVE. When CTG 7.4 helicopters were involved the AvGas was chargeable to CTG 7.4. An AOG was still required to furnish MoGas to Bikini at frequent intervals because of the relatively small capacity.

Prior to departure of the AO to WestPac, AvGas was reduced to 10M BBLs and diesel to zero. Arrangements to reduce to this load were normally made with the Commanding Officer, U.S. Naval Station, Kwajalein who could take any excesses.

Except for the larger units such as the USS BADOENG STRAIT (CVE-116), USS ESTES (AGC-12), USS CURTISS (AV-4), and USNS FRED C. AINSWORTH (T-AP-181), replenishment was conducted at anchor. No untoward difficulty ensued in having the AO proceed alongside of the YAG's, or the T-LST's proceeding alongside of the AO.

At Eniwetok the YON-182 was moored to a buoy off Eniwetok Island in berth L-4. Her maximum capacity, limited because of unusable tanks, was 2,200,000 gallons. The YON-182 was utilized frequently by the smaller units

maintained in the Eniwetok area, and occasionally by the USS CATAMOUNT (LSD-17) and USS KNUDSON (APD-101). The need for a barge of this capacity in the Eniwetok area can not be overstressed. Commandant FOURTEENTH Naval District supplied four experienced personnel to operate the YON-182. There were assigned berthing and messing facilities at Eniwetok Island with the CTG 7.3 Boat Pool Detachment.

The USS BADOENG STRAIT (CVE-116) was also used for fueling smaller units in the Bikini area during periods prior to arrival of the first AO and during those periods when the AO was absent from Bikini. The stern method of fueling was employed and worked successfully. However, a considerable degree of time and effort was required for rigging. Because of the many duties of the USS BADOENG STRAIT (CVE-116) as SOPA(Admin) Bikini and as supporting unit for the helicopter squadron, fueling from the CVE is not recommended as a substitute for the AO or YON.

For emergency fueling of tugs, diesel oil was available from AF's when in the Pacific Proving Ground or from the LST's and YAG's. In addition, T-LST's could be utilized for emergency fueling of the diesel oil supply for Holmes and Narver Bikini or Eniwetok.

#### 4.7.5 CONCLUSIONS

1. During Operation REDWING, fueling at anchor except for the USS BADOENG STRAIT, USS ESTES, AND USS CURTISS and USNS FRED C. AINSWORTH was the rule rather than the exception.

2. Twelve million BBLs diesel, 4M BBLs AvGas, and the 80M BBLs NSFO was sufficient supply for a six week period for the Navy forces assigned during Operation REDWING. This figure includes diesel for the two USNS T-LST's and the shore facilities at Bikini.

3. Assignment of a YON at Eniwetok is a necessity because of the frequent operations of the DD's and DE's.

4. Rotation of an AO at 4-6 week periods in the Pacific Proving Ground is adequate.

#### 4.7.6 RECOMMENDATION

A procedure similar to that outlined above be followed for future operations of this nature.

#### 4.8 SURFACE AND AIR TRANSPORTATION

##### 4.8.1 SURFACE TRANSPORTATION

In the Bikini area intra-atoll transportation was afforded both by the Task Group 7.3 Boat Pool and the Task Group 7.5 Boat Pool. A total of 17 LCM's and 5 LCU's were employed in the Bikini area. The number of boats available was ample; however, the number of crews required for long hours, both day and night, caused some limitations. The efficiency of surface transportation was aided greatly by the new anchorage assignments placed into effect by CTG 7.3. All units were placed much closer toward Enyu Island with enormous mileage savings over previous operations.

In the Eniwetok area the Task Group 7.3 Boat Pool Detachment Eniwetok afforded a means of daily U.S. Mail and guard mail delivery and pick-up. In addition the Boat Pool Detachment provided daily service to and from the Navy recreation center, Camp Parsons, at Japtan Island. Many other trips of a diversified nature were required of the Boat Pool Detachment, Eniwetok. These trips, many late at night, or at odd times of a non-routine nature and on weekends placed long working hours on this small detachment which had but enough men to furnish one crew for each boat.

Inter-atoll transportation was not required of the USS KNUDSON (APD-101). Since no contamination was suffered at any of the airstrips the regularly scheduled "reflector" flights by C-47's was able to take care of all of the passengers requirements between Bikini and Eniwetok Atolls. The T-LST's conducted routine cargo lifting between Bikini and Eniwetok Atolls at about 3-4 day intervals.

##### 4.8.2 AIR TRANSPORTATION

CTG 7.3 Representative Eniwetok handled the bookings of all passengers leaving the Pacific Proving Ground by MATS, and in addition booked all CTG 7.3 personnel and cargo departing Eniwetok for Bikini by "reflector flights"

operated by CTG 7.4.

An average of 16 cases of emergency leave were handled per month. Rarely, if ever, was a man required to wait beyond the next flight departing for Continental U.S. after arrival at Eniwetok. In some cases the man concerned was placed on a flight within less than an hour. All bookings were handled by telephone.

All MATS bookings were arranged through the Task Group 7.3 Air Traffic Sub-Station. In all "emergency leave" cases messages were sent to the JTF-7 LNO Hickam AFB giving man's name, flight number, and plane number and requesting reservations be made on next departing flight.

Passengers for "reflector flights" to Bikini were booked through CTG 7.5 TCA except on D-1 and D days when arrangements were made directly with CJTF-7 on a "quota" basis.

Bookings for passengers from Bikini to Eniwetok were normally handled by CTG 7.3 through the JTF-7 LNO at Bikini who was stationed ashore.

Cargo arriving by MATS at Eniwetok was separated by a CTG 7.3 Representative storekeeper and either routed directly to ships at Eniwetok, or forwarded by via air "reflector" to Bikini, or trucked to CTG 7.5 at Parry Island for surface transportation to Bikini by T-LST. The lift furnished by MATS to Eniwetok benefited the operation greatly in providing urgently needed items in a very small amount of time.

#### 4.9 FUNDING

Funding for Navy participation in Operation REDWING under Task Group 7.3 falls under three headings:

1. Navy Department Funds.
2. Joint Task Force SEVEN Maintenance and Operations Funds.
3. Armed Forces Special Weapons Project Funds.

The partition of funding was based on the memorandum from the Assistant Secretary of Defense (Comptroller) dated 9 March 1953, subject: "Assumptions for Operating Expenses of Atomic Weapons Tests." Primarily, this delineates the "Normal Service Operating Expense" to be financed by the Services and

"Extra Expenses" to be financed out of funds made available to the Task Force Commander. The most significant portion concerns furnishing by the Services "standard equipment and supplies necessary for the operation, including maintenance, parts, POL and consumable supplies required in support of the Department of Defense participation." This provision enabled the task group to obtain on loan many required items without the expenditure of funds. Thus, equipment not ordinarily on ships' allowances, particularly large amounts of communications equipment, were obtained from the Services. Since test operations are not of a continuous nature and the need for this equipment does not exist for the interim period the material can be obtained and returned without a detailed funding procedure.

Navy Department funds were expended during the operation in the regular support of twenty ships and six units and their 4,688 personnel. While a large portion of this expenditure would continue regardless of participation in the operation there are areas of increased expenditure directly as a result of the operation. The areas include expenditures for special projects, logistics support by refrigerated and cargo ships and logistics aircraft, increased expenditures by type commanders for larger stock levels and heavier maintenance. In addition, the 25 percent ration allowance increase authorized by the Bureau of Supplies and Accounts cost an estimated \$149,000.00.

The extra military funds made available to Task Group 7.3 by Joint Task Force SEVEN were for travel and per diem, modifications of small craft and shipment of things. A large portion of extra military funds was for modification of ships. This was handled by requests for installations to the Bureau of Ships via CJTF-7. Estimated funds were reserved for these installations by CJTF-7 by letter authority to the Bureau of Ships. The Bureau of Ships financed the installations through naval shipyards for subsequent billing and transfer of funds to the Bureau of Ships. Final billings have not been consummated in all instances and a total amount is not available. A breakdown of direct Navy expenses and extra military funds estimated for the preoperational period and the operational period is as follows:

**NAVY FUNDS<sup>1</sup>**

	Preoperational Period <u>7-1-55 to 3-16-56</u>	Operational Period <u>3-16-56 to 8-1-56</u>	<u>Total</u>
Ships' Operating Expenses		\$ 5,231,580.00	\$5,231,580.00
Military Pay	\$485,625.00	4,248,192.00	4,733,817.00
Subsistence	<u>83,916.00</u>	<u>750,720.00</u>	<u>834,636.00</u>
Sub-total	\$569,541.00	\$10,230,492.00	\$10,800,033.00

**EXTRA MILITARY FUNDS<sup>2</sup>**

Travel and Per Diem	\$ 34,482.60	\$ 186,300.00	\$ 220,782.60
Modification of Small Craft	24,517.50	528.47	25,045.97
Shipment of Things(special)		<u>115.00</u>	<u>115.00</u>
Sub-total	<u>\$ 59,000.10</u>	<u>\$ 186,943.47</u>	<u>\$ 245,943.57</u>
Total	\$628,541.10	\$10,417,435.47	\$11,045,976.57

During the planning period there was considerable confusion on many levels within the bureaus and type commanders as to the responsibility for service funding for atomic tests. While the DOD memorandum of 9 March 1953 had received wide distribution a number of inquiries and some confusion resulted as to funding. It was apparent that budgeting for extra expenses to be incurred for atomic tests had not been made within some service components. These problems were generally worked out through correspondence and conferences but programming and budgeting based on previous operations would have eliminated much confusion.

**4.9.1 CONCLUSIONS**

1. The division of funding between services' expenses and extra military expenses provided a means for furnishing required ships, service craft and equipment with a considerable less expenditure of funds than if required equipment had to be purchased for atomic tests.

2. Some bureaus and type commanders apparently had not reserved funds in advance to finance the added costs of atomic tests.

1. Not included are expenditures for special projects and installations financed by BuShips, costs of logistics ships and aircraft and transportation costs absorbed by the Navy. Also an estimated \$100,000 was spent by BuShips on water washdown equipment.

2. Not included are modifications to ships and also charter of one T-AP and two T-LST's at \$5,685.00 and \$3,290.00 per day respectively.

#### 4.9.2 RECOMMENDATIONS

1. That the general concept of division of funding between services expenses and extra military expenses be continued.

2. That the cognizant bureaus and type commanders be informed early in the planning stages of the extent of Navy participation and encouraged to budget for the additional expenses.

3. The memorandum from Assistant Secretary of Defense (Comptroller) dated 9 March 1953 or a similar division of funding policy document be issued as an instruction by the Chief of Naval Operations or other competent authority.

#### 4.10 SHIP MAINTENANCE

Ship maintenance in an extended operation such as Operation REDWING consists essentially of three parts; preparation, preventive maintenance, and corrective maintenance.

Maintenance preparation includes both the complete overhaul of all known deficiencies prior to the commencement of the operation, and the stocking of all predictable maintenance parts, tools and equipment. Operation REDWING ships were well prepared in this respect, notwithstanding the low water casualty that befell USS CATAMOUNT (LSD-17) boiler #1 at Pearl Harbor and the casualty occurring to the USS JAMES E. KYES (DD-787) #2 low pressure turbine at San Francisco, California. These fall under the heading of "unforseeable."

Preventive maintenance is a regular routine with every engineering officer, and on an extended operation, becomes increasingly important. Although CTG 7.3 is in firm agreement with the views stated in Commander in Chief, U.S. Pacific Fleet's message 012316Z of December 1955 to the effect that uninterrupted upkeep averaging 6 days duration must be granted to ships every month, there were no major lulls except the period between DAKOTA on June 26 and HURON #1 on July 2 which permitted periods of longer than three or four days at a time. In many cases, a ship would be granted an upkeep period, only to have it cancelled a day or two later to perform some new task. It was gratifying to see how ships have carried out preventive

maintenance almost in spite of operational commitments.

Corrective maintenance consists of solving the major problem when it arises, and arise it will in spite of every care. In an effort to meet this known problem, CTG 7.3 message 232013Z of March 1956 requested that a repair ship or tender be routed through the Pacific Proving Ground enroute between the Far East and Pearl Harbor, for a stay of about two weeks, in order to help bring the ship's material readiness level back up to a point where successful completion of the operation would be insured. This request could not be granted for lack of availability of a tender or repair ship. Ships improvised, helped themselves, and each other to maintain full readiness to carry out their tasks.

Each ship has a commendable list of jobs which they have successfully undertaken, but the most ambitious appears to be USS BADOENG STRAIT (CVE-116) repairs to #3 boiler, wherein she renewed 136 tubes, repaired superheater support plates, replaced a section of the inner casing, and renewed all brickwork, with the advice and assistance of one boilermaker from Pearl Harbor Shipyard. This job was completed within 42 days of a casualty which ruptured two water wall tubes, and caused sagging, warping and distortion to other water wall and water screen tubes.

The ample provision of maintenance parts, in general, enabled ships of Task Group 7.3 to satisfy their own requirements. In the event that a ship did not have a necessary part on hand, a message to all ships present frequently located one. If it didn't, then a priority requisition was initiated. The support received from continental supply activities was most gratifying.

Ships were directed to stock 180 day supply of electronics maintenance parts. This has helped them over what otherwise might have been a serious shortage.

At the request of CTG 7.3, Commander Service Force, U.S. Pacific Fleet, through Commander Service Squadron THREE, ordered two RCA Field Engineers to temporary duty with the staff for the duration of the operation. These

engineers have been extremely valuable and have contributed in a large measure to the continued electronics readiness of ships of the task group. One engineer was a communications expert, one a radar expert. Between them they were able to advise ship maintenance personnel on all phases of shipboard electronics maintenance, as well as trouble shoot the casualties which stop maintenance personnel of less experience.

In addition, two ET3's were assigned the staff who worked independently where able, or as assistants to the field engineers. It is felt that their efforts, too, were of considerable significance in maintaining electronics efficiency.

The most significant ship repair facilities ashore in the Pacific Proving Ground were the Holmes and Narver shops on Parry Island at Eniwetok Atoll (under CTG 7.5). Holmes and Narver does all AEC construction work and their facilities have been made available to ships in an emergency when other forces afloat could not handle the job. They have an electric shop, sheetmetal shop, carpenter shop, light machine shop, automotive repair shop, refrigeration shop, pipe and welding shop, sandblasting and painting facilities. Also available was a floating drydock, (1,000 ton capacity, AFDL 217), which Task Group 7.5 used to service LCU's, YTL's, barges and the like. These shop facilities are rather limited in capacity and capability when compared with shipyard shops, but they have made some important emergency repairs to ship's equipment.

On Enyu Island at Bikini, CTG 7.5 had some shop facilities which were considerably smaller in scale than the Parry Island shops. However, in emergencies they performed very valuable work, the most significant being washdown system repairs, generator and pump repairs for YFNB's.

At Kwajalein, the ship's department had small boat shops; carpenter, electric, light machine, boat engine, and canvas shop and a 1,000 ton capacity floating drydock. These facilities although well occupied in maintenance of the Naval Station Service Craft; could, in cases of emergency, render assistance on an "assist ships force" basis. These facilities were not

used during Operation REDWING.

The facilities of Pearl Harbor Naval Shipyard were available in emergencies. Items could be air transported to the shops at Pearl Harbor, or men and material could be transported into the Pacific Proving Ground. On two separate occasions the USS CATAMOUNT (LSD-17) sent a number of electric motors to Pearl Harbor Naval Shipyard to be rewound. The shipyard sent a leading-man boilermaker and all necessary materials to enable the USS BADOENG STRAIT (CVE-116) to make complete repairs to her #3 boiler.

Boiler maintenance was carefully followed by all ships. Periods for cleaning firesides were usually fairly easy to schedule. However, the cleaning of watersides, requiring considerable more time (5-7 days), was more difficult to schedule. USS ESTES (AGC-12) obtained permission from Commander Amphibious Forces, U.S. Pacific Fleet to defer cleaning of watersides until return to Continental U.S. because the ship's operation schedule precluded a one week at anchor period.

A large number of the material failures appeared to be electric motor failures. The large ships (USS BADOENG STRAIT, USS ESTES, and USS CATAMOUNT) did considerable motor rewinding for themselves and other smaller ships. Holmes and Narver accomplished some electric repairs and Pearl Harbor accomplished some.

Mark 25 Radar was employed by the USS CURTISS (AV-4) and the DD's to track weather balloons, and by the DD's to track LOKI rockets and window projectiles as well. The importance of this weather information required the Mark 25 Radar to be in continuous operation. The USS SHELTON (DD-790) suffered two radar casualties while on weather station and had to return to port for assistance by the RCA Field Engineer. The USS CURTISS (AV-4) interrupted her upper air soundings on one occasion until the field engineer returned her radar to service.

The AN FRC-27 equipments on nearly all ships required some attention from the field engineers and staff ET's. The Boat Pool, Eikini, held maintenance parts for these equipments, and frequently gave assistance to ships.

requiring it.

The RCA Field Engineers accomplished some 125 jobs on electronics equipments in ships of Task Group 7.3 during the fifteen weeks of the operation period. The division of jobs into radar and communications appeared to work well, with other equipments, such as Loran and Sonar being assigned to whichever engineer was then available.

#### 4.10.1 CONCLUSION

All ships of Task Group 7.3 were commendably well prepared, from a material condition point of view, to undertake an extended operation remote from shore industrial facilities. In nearly every instance, the ships were in good shape upon arrival in the Pacific Proving Ground, were adequately stocked with maintenance parts, and were equipped to meet and solve engineering emergencies as they arose. Although the phrase "untrained personnel" arose occasionally, the more experienced members of the engineering force trained the new men and, in effect, "held school" whenever a casualty would arise. The ability to help oneself -- and others less capable -- was demonstrated to a commendable degree many times.

#### 4.10.2 RECOMMENDATIONS

1. That each ship arrive in the exercise area in the best possible material condition.
2. That maintenance parts be adequately stocked to last through the period of the operation.
3. That personnel be drilled in casualty procedure at every opportunity.
4. That repair instruction be conducted at every opportunity when restoring a material casualty.

#### 4.11 ROLL-UP

The roll-up procedure was incorporated into CTG 7.3 Notice 04500 of 30 January 1956. This procedure aimed at an orderly and detailed reporting of equipment and installations made for Operation REDWING, so that proper custody could be retained, and also, so that restoration of ships to original

conditions could be planned in a proper manner.

During the operation CTG 7.3 would issue disposition instructions for return of all material, and upon completion of the operation would coordinate arrangements with the ship, BuShips, type commanders, and CJTF-7 for restoration to original configurations.

Although the procedure and reporting have been well organized and fairly complete records exist both in CTG 7.3 files and each ship's files, certain essential data was not recorded and as a consequence required searching through files in an attempt to obtain this data. Missing data entailed invoices of shipments, or original sources of equipments, or failure to include in the reports, spare parts, or serial and stock numbers of component parts of an equipment.

#### 4.11.1 CONCLUSIONS

1. Roll-up instructions would have been much more effective and less time consuming if issued prior to equipment installation dates.

2. The procedure for roll-up was well organized and provided an excellent and orderly picture of the restoration to original configuration required in each ship.

#### 4.11.2 RECOMMENDATION

1. The roll-up instructions similar in form to that provided in CTG 7.3 Notice 04500 of 30 January 1956 be issued to each ship and unit and type commander at the time that the operational forces are designated.

#### 4.12 PORT OPERATIONS

At Eniwetok the staff of Commander Destroyer Squadron THREE (SOPA(Admin) Eniwetok) was stationed ashore at Parry Island in the CJTF-7 Administrative Compound to act as CTG 7.3 Representative. The Logistics Officer and Comptroller of the staff of CTG 7.3 were also berthed ashore to handle logistics matters at the port of entry for cargo and personnel. A communications center was also manned by CTG 7.3 personnel for voice and CW communications. Incoming and outgoing teletype or encrypted messages were routed via the CJTF-7 crypto center.

#### 4.12.1 COMMENTS

Incoming and outgoing shipping, mainly the AF's, AOG's and MSTs cargo vessels were all controlled by CTG 7.3 Representative Eniwetok. Anchorages or berths were assigned based upon requirements. Voice communications were controlled over the Harbor Control Net.

Efficient port operations were maintained by making advance telephone arrangements with CTG 7.5 for stevedoring, or tugs, or fuel requirements. Similar arrangements were made with CTG 7.4 for fueling at Eniwetok Island. CTG 7.2, who acts as Atoll Commander during the interim period, and as such conducts port operations during the interim period, was kept informed in regard to the need for processing any passengers ashore or for any briefings required by port regulations in effect at Eniwetok or Parry Islands.

Boarding parties were sent to each ship upon anchoring or after tying up at the pier. After ships had visited the area many times, such as the AF's and AOG's, only pertinent briefings were required. Ships were normally given advance messages prior to arrival as to intentions, so that no time was wasted in preparing for unloading cargo or fuel.

Other functions delegated to CTG 7.3 Representative Eniwetok were:

1. Operation and management of Camp Parsons on Japtan Island.
2. Operation of the CTG 7.3 Communications Center, Parry Island.
3. Billeting of TG 7.3 personnel, Parry Island.
4. Deployment and reentry of ships for those shots at Eniwetok which required clearing of the lagoon.
5. Scheduling of boats for recreation, U.S. Mail, guard mail, boarding parties, and cargo requirements.
6. Operation of the guard mail center Eniwetok.
7. Representation for CTG 7.3 at weather briefings, or other conferences held by CJTF-7.
8. Liaison with CJTF-7 or other task groups on matters pertaining to CTG 7.3.
9. Scheduling fueling operations alongside of YON-182.

Personnel requirements for conducting port operations at Eniwetok were efficiently handled as follows:

Function	Assigned
Command	ComDesRon THREE
Port operations of ships, administration	Chief of Staff officer ComDesRon THREE
Security, communications, boarding, U.S. Mail	Communications Officer ComDesRon THREE
Status of ships, anchorage assignments, fuel percentages, arrivals and departure status board, and signal tower.	QM1
Operations of the communication center, billeting of personnel	Communications Officer CTG 7.3 staff
Logistics matters, evacuation liaison with CJTF-7, roll-up matters	Logistics Officer CTG 7.3
Air transportation bookings, replenishment details, travel and per diem, accounts for Camp Parsons, scheduling of incoming and outgoing cargo for TG 7.3 ships.	Supply Officer CTG 7.3
Management Camp Parsons, boat pool schedule, and arrangements for YON-102.	Engineering Officer

Enlisted personnel requirements total:

1. Disbursing storekeeper for travel and per diem.
2. Storekeeper for accounts for Camp Parsons, and cargo handling.
3. Storekeeper for roll-up, and cargo handling.
4. Yeoman to maintain files of CTG 7.3 Logistics, log all mail, distribute guard mail.
5. Yeoman for ComDesRon THREE.
6. Steward for ComDesRon THREE.
7. Guard mail petty officer and assistant yeoman for DesRon THREE.
8. Two personnel assigned to CTG 7.3 Post Office on Eniwetok Island to process fleet mail.
9. Five personnel to operate Camp Parsons.
10. One ET to maintain electronics equipment in boat pool and communications center.

11. Three radio supervisors for communications center.
12. Six radiomen for communications center.

#### 4.12.2 ADMINISTRATIVE REQUIREMENTS

The space allocation reserved for Task Group 7.3 Representative was found to be inadequate. Insufficient office space was provided since designation of Destroyer Squadron THREE as Task Group 7.3 Representative and SOPA(Admin) Eniwetok was made after allocations of space were made. The following spaces were allocated:

Task Group 7.3 Rep (DesRon THREE)	11½' x 20'
Logistics Section	11½' x 20'
Communications	24' x 24'

Additional space was requested and an additional 11½' x 20' office was obtained next to the spaces previously allocated. The above office spaces are considered to be the minimum acceptable under a similar situation. Within the above, office space was provided for CTG 7.3 when ashore.

The below tabulation lists the office equipment available for Operation REDWING and the amounts recommended for a similar operation with the same personnel and duties:

#### Task Group 7.3 Representative (ComDesRon THREE)

<u>MATERIAL</u>	<u>AVAILABLE FOR OPERATION REDWING</u>	<u>RECOMMEND NEXT OPERATION</u>
Telephone, double switch	2	2
Fans, pedestal	0	1
Desks, executive	3	3
Hall Tree	1	1
Chair, w/arms	2	2
Chair, w/o arms	1	1
Waste Baskets	3	3
Folding Chairs	3	3
Table Fan	1	1

#### Task Group 7.3 Representative (Logistics)

Telephones, double switch	2	2
Pedestal Fans	0	1
Desk, executive	3	3
Desk, typewriter	2	2
Chairs, w/o arms	2	2
Chairs, w/arms	3	3
Waste Baskets	5	5
Typewriters	2	3
File Baskets	11	11

Task Group 7.3 Representative (Logistics) Cont'd

<u>MATERIAL</u>	<u>AVAILABLE FOR OPERATION REDWING</u>	<u>RECOMMEND NEXT OPERATION</u>
Adding Machine	1	1
Safe, file	2	2
Table	1	1
Hall Tree	1	1
Fan Table	1	1
Communications Section		
Telephones, double switch	2	2
Pedestal Fan	0	1
Desk, executive	1	1
Desk, typewriter	1	1
Chairs, w/arms	2	2
Safe, file	1	1
Waste Baskets	2	2
Typewriters	3	3
File Baskets	10	10
Chairs, folding	3	0
Charis, w/o arms	0	3

Task Group 7.3 Representative's Office

Desk, typewriter	3	3
Desk, executive	1	1
Chairs, w/o arms	4	4
File Baskets	8	8
Typewriter	2	3
*Files, w/lock	3	3
*Files, w/lock	2	2
Waste Baskets	1	3
Duplicating Machine	1	1

\*4 files used exclusively for DesRon THREE paper work.

The automotive allocation for task group assigned was found to be totally inadequate and until corrected, seriously effected operations of the office. In order to solve this deficiency a jeep was borrowed from the USS ESTES (AGC-12) and another jeep and a truck 3/4 ton was obtained by increase in the allowance. The following vehicles were on board after increases, and are considered the minimum requirements:

- Two jeeps
- One truck, 1/2 ton
- One truck, 3/4 ton

In addition at least one jeep and two trucks were required by the Boat Pool Detachment, Eniwetok.

The subject of storage space requirements ashore for storage of cargo

and provisions is covered under construction.

#### 4.12.3 CONCLUSIONS

1. The office space allocated for Task Group 7.3 Representative was not adequate until a reallocation was made during the operational period.
2. The allocation of vehicles for Task Group Representative was not adequate.

#### 4.12.4 RECOMMENDATIONS

1. That the following office space be provided for Task Group 7.3 Representative for subsequent operations when a representative office is established on Parry Island:

Task Group 7.3 Representative	11½ x 20 ft
Logistics Section	11½ x 20 ft
Administrative Section	11½ x 20 ft
Communications Section	24 x 24 ft

2. That office equipment as listed above be provided by Task Force SEVEN on the same basis as similar equipment is provided for the Task Force Headquarters.
3. That the following automotive equipment be provided for Task Group 7.3 Representative ashore during future operations:
  - Two jeeps
  - 1 truck, ½ ton
  - 1 truck, ¾ ton
4. That the Task Group 7.3 Boat Pool Detachment, Eniwetok be provided one jeep and two trucks.

#### 4.13 BOAT POOL

The boat pools in the Pacific Proving Ground consisted of two elements. The Task Group 7.3 Boat Pool, Coronado functioned at Bikini. It numbered 207 men and consisted mainly of 5 LCU's and 20 LCM's. Two of these LCM's had ramps removed and bows strengthened for use as "pushers" for barges, ships, etc. Three of the other 13 LCM's and crews were sent to Eniwetok to assist the small detachment in that vicinity. The Boat Pool Detachment, Eniwetok

consisted of two LCPL's and two LCM's with a total of about 18 men and one officer. Due to the required nature of the work in Bikini it is considered that requirements for Navy boat pool craft may be reduced for future operations. The AEC contractor should operate additional craft to service CTG 7.1 requirements.

#### 4.13.1 COMMENTS

The five LCU's were used little if at all for Navy requirements. Midway through the operation one LCU was transferred to Eniwetok for use in transporting recreation parties from ships in the lagoon to Japtan Island. This craft easily crossed the rough waters of "Deep Entrance" without discomfort or "wetting by spray" of the passengers. The other four LCU's were used primarily in Bikini for work requested by CTG 7.1 or to assist the AEC contractor. These five LCU's were received in an inactivated condition and required many thousand man hours of maintenance and repair. In addition the expense of equipping and spare parts was considerable.

The 15 LCM's at Bikini were adequate for the job. Even so, however, there seemed an insufficiency of this type craft to handle recreation and liberty parties. Two LCM's were used as Taxis for the larger craft on a scheduled basis, but the schedule seemed comparatively slow and the smaller ships with boats unsatisfactory for these waters and landing areas were always in need of boats.

At Camp Blandy there is no pier for boats except a small pier constructed on oil drums and used as an officer's landing. Next to the pier was a beaching area for landing craft. All enlisted recreation parties necessarily had to use the LCM's provided by the boat pool except for the USS KNUDSON (APD-101) and larger units which were provided with LCVP's.

At Eniwetok the services provided by the Boat Pool Detachment consisted of regularly scheduled U.S. Mail and guard mail runs once per day; a daily run between Eniwetok and Japtan for CTG 7.2; almost a daily morning logistics run between Parry Island and Japtan for servicing Camp Parsons. The AEC contractor provided hourly runs for personnel and cargo between the Parry

Island LCM ramp and Eniwetok during daylight hours. In addition fast water taxi service was provided by the AEC contractor between the personnel pier Parry and Eniwetok each hour during daylight. This latter service commenced midway in the operation.

Although the LCPL's at Eniwetok were a convenient craft for boarding and for officer's use the LCM's are considered capable of providing this necessary service.

At Bikini the YFN-944 carried the majority of spare parts for the boat pool at Bikini. At Eniwetok a new warehouse was provided for office space and for storage. This warehouse will probably revert to CTG 7.2 now that the boat pool at Eniwetok is in process of disestablishment during interim periods. Due to the remoteness of Eniwetok from the center of Navy activity at Parry and Japton the Boat Pool Detachment, Eniwetok could more efficiently operate from Parry Island.

#### 4.13.2 CONCLUSIONS

1. LCU's should not be operated as a portion of the Navy Boat Pool. Functions required of LCU's should be provided by the AEC contractor. At the most one LCU should be operated by the Navy Boat Pool at Eniwetok for recreation parties.

2. A complete LSD load of LCM's can be utilized for future operations of this nature including the two LCM's converted into "pushers." Five LCM's should be provided for the Eniwetok area and 13 for the Bikini area. In addition, where feasible, each ship designated for the operation should carry at least one LCM or LCVP.

3. The number of personnel in the Boat Pool Bikini and Eniwetok might be reduced by providing more maintenance personnel and having ship's personnel except engineers operate the craft. The boat pool should provide the operating personnel for 13 LCM's.

#### 4.13.3 RECOMMENDATIONS

1. The AEC contractor provide sufficient LCU's for all requirements generated by Commander Task Group 7.1.

2. The Navy provide one fully manned and operational LCU for use in Eniwetok.
3. Twenty LCM's be provided for future operations of this nature of which five are allocated to Eniwetok.
4. Ships designated for the operation carry landing type craft if feasible.
5. A system whereby ships provide operating personnel for seven boat pool boats be inaugurated; the boat pool personnel be augmented with sufficient maintenance personnel to maintain all boats.
6. The Boat Pool Detachment Eniwetok be housed on Parry Island in future operations.
7. The spare parts and equipment for the Boat Pool Detachment Eniwetok should be provided in the Continental U.S. in large wheeled vans similar to electronic vans. Ease of movement to and from Continental U.S. would be obtained.

#### 4.14 EVACUATION

Pre-shot evacuation of Bikini Atoll was conducted prior to each shot at that atoll. No pre-shot evacuations were conducted at Eniwetok Atoll for shots conducted at that location.

Personnel evacuated at Bikini averaged for the larger units as follows:

SHIP	AVERAGE TOTALS AFLOAT	NUMBER OF EVACUEES	AVAILABLE SPACES FOR EVACUEES	
			OFFICER GRADE	ENLISTED GRADE
USNS AINSWORTH	700	510	326	684
USS ESTES	660	60	88	286
USS BADOENG STRAIT	1000	90	28	126
USS CURTISS	640	100	120	450

After the first few shots the number of evacuees decreased in number, probably due to familiarization, greater efficiency, and evidence that all personnel previously sent were not required.

The USS BADOENG STRAIT (CVE-116) was considerably overcrowded for each shot and personnel of necessity were placed in cots. In each case the demands for personnel in the BADOENG STRAIT were based on the apparent need for helicopter flights at an early hour after reentry.

In the majority of cases final evacuation was not completed until well after dark. In some cases this was due to late designation of D-1. Evacuation in all cases, however, was considered to operate quite smoothly due to a sufficiency of boat and helicopter transportation.

Aboard ship accounting lagged somewhat due to late minute arrivals. The system of having each task group responsible for furnishing a muster of its own personnel aboard each ship, to the commanding officer's representative, was well planned, but some task group muster officers were the last to report on board and as a consequence placed a burden on the ship's personnel to muster or arrange details for the advance personnel.

The authorized uniform of aloha shirts and shorts were specified as appropriate wardroom dress by CTG 7.3. However, difficulty was achieved in maintaining this standard in the wardrooms of the USS BADOENG STRAIT (CVE-116), which was required to serve in three shifts, and arrange "cot accommodations" in the hangar space.

The staff of CJTF-7 sent many officers and men to the first shots, causing use of practically all officer accommodations aboard. In later shots as few as seven CJTF-7 staff members were embarked to handle its responsibilities.

#### 4.14.1 CONCLUSIONS

1. Evacuation was well planned and proceeded in an orderly manner.
2. An accurate detailed listing of personnel of Task Group 7.1 cannot be maintained due to changes occurring on D-1, and the apparent decentralization of project personnel.

#### 4.14.2 RECOMMENDATIONS

1. Pre-shot evacuation be conducted as previously, except that more detail must be placed in regard to the specific duties of the task group muster officers as concerns time of arrival in the ship, advance copies of muster sheets, and informing commanding officers of approximate numbers of personnel to expect.

#### 4.15 MEDICAL

##### 4.15.1 ADMINISTRATIVE DETAILS

Task Group 7.3 included about 20 ships and 6 units with a total complement of about 4,689. Six medical officers, not including the Staff Medical Officer, and three dentists were assigned to the large ships. Excellent surgical facilities were available on the USS BADOENG STRAIT (CVE-116), where the Senior Medical Officer was a qualified surgeon which proved to be adequate for the needs of the task group. The Medical Officer on the USS CATAMOUNT (LSD-17) was qualified in internal medicine. The Medical Officer belonging to the Staff of Commander Destroyer Squadron THREE on the USS SHELTON (DD-790) was initially assigned medical responsibility for five of the smaller ships, but was later transferred to CTG 7.3 Representative on Parry Island to care for service personnel reporting to the Holmes and Narver Hospital.

A Medical guard was established on a rotational basis for the ships at Bikini having a medical officer by SOPA(Admin) Bikini. SOPA Instructions (Bikini) originally required a beach guard for Camp Blandy including one Hospital Corpsman assigned for one week on rotational basis from all ships. This left smaller ship, with only one Hospital Corpsman, unattended during this period which was corrected by limiting this assignment to ships having the medical guard. No attempt was made to establish a medical guard at Eniwetok due to the few ships having a medical officer. Hospital facilities were readily available on Parry and Eniwetok Island.

Since the mission of the Medical Departments of the ships of the task group was routine medical care covered by Bureau of Medicine and Surgery Instructions and the Manual of the Medical Department only a small number of Instructions and Notices were issued. A uniform method of recording exposure of personnel to ionizing radiation, in health and medical records as required by NavMed P-1325 was issued as CTG 7.3 Instruction 6150.1. Ships not having a dental officer were assigned to specific ships for dental treatments by CTG 7.3 Notice 6620. Message instructions were issued to all ships to assure compliance with Chapter 9 Manual of Naval Hygiene following a small outbreak

of food poisoning on the USS MT MCKINLEY (AGC-7). Instructions were issued, to the ships concerned, for the collection of one 24 hour urine specimen weekly from ten volunteers (two each from five ships) for 20 weeks in cooperation with the Department of Biophysics, Walter Reed Institute of Research in a study of internal radiation hazards. It was noted from these urine specimens that many individuals had a low, around 750 cc, urine output indicating a need for greater fluid intake.

#### 4.15.2 HEALTH AND SANITATION

In general the health of the personnel of Task Group 7.3 was excellent. There were no deaths, no serious injuries and only 11 patients transferred to the U.S. Army Hospital Facility, Eniwetok for evacuation to Tripler General Hospital in Honolulu, from a total of 40 hospitalizations.

A mumps epidemic developed on the USS CATAMOUNT (LSD-17) (three cases) during February and on the USS ESTES (AGC-12) (16 cases) in March. Since the USS CATAMOUNT had on board about 250 boat pool personnel engaged in operating boats to all of the ships there was danger of spreading the epidemic. Likewise the USS ESTES being the flagship of the task group there was danger of exposing key personnel of the operation. All of the individuals on these ships not having a history of mumps were given 3 cc of Human, Immune Serum Globulin after which no further cases developed.

A food poisoning outbreak occurred on the USS MT MCKINLEY in May involving 22 individuals. The food responsible, turkey and tuna sandwiches, was prepared in the wardroom galley at 0630 and kept without refrigeration until eaten between 1200 and 1400 on Japtan Island. The remainder of the sandwiches were given to enlisted personnel and eaten around 1500. The severe cases of poisoning were among this latter group. As a result of this incident a message was sent to all ships requiring strict compliance with Chapter 9 Manual of Naval Hygiene.

Accidents of consequence included the partial avulsion of an ear in a man caught between the ship and a boat on the USS CATAMOUNT (LSD-17), while engaged in repair work. This injury was treated on board with good results. The other was a shark bite on the leg of a man swimming from a sailboat in

the Bikini Lagoon.

Early in the operation all of the ships were visited in order to meet the Medical Department personnel and hold informal inspections of the ship. Sanitary conditions were found to be satisfactory in all cases.

Recreation facilities, Camp Parsons, was constructed on Japtan Island, Eniwetok and Camp Blandy on Enyu Island, Bikini. Fresh water showers and flushing toilets were available on Japtan. Later a snack bar was opened. Sanitary conditions of the camp were excellent. On Enyu Island no water was available for showers or toilets and, therefore, screened pit latrines had to be used, which created a sanitary problem. Continual spraying and use of fly traps was necessary to cope with the problem. The snack bar was also screened. Sanitary conditions were satisfactory.

#### 4.15.3 MEDICAL FACILITIES

The medical facilities on board the ships of Task Group 7.3 were adequate in all but a few instances. The X-Ray equipment on the USS BADOENG STRAIT (CVE-116) was used to take 259 radiographs with the result that the technician received 5.0 r as indicated by the film badge reading. This was reported in accordance with current instructions. There was no EKG machine available in the task group. In one instance where it was urgently needed the patient had to be transported from Bikini to the Army Hospital Facility Eniwetok Island. There was also no dental prosthethetic laboratory available to the task group and it was necessary to send a number of patients to Kwajalein for this service. There were no facilities for eye refractions, but those having prescriptions received excellent service from the Navy Optical Dispensing Unit in the Navy Yard, Pearl Harbor, T.H.

Other medical facilities utilized effectively were the U.S. Army Hospital Facility on Eniwetok Island and the Holmes and Narver Hospital on Parry and Enyu Islands. Air transportation for patients from Bikini to Eniwetok was handled in an efficient manner.

#### 4.15.4 RADIATION HAZARDS

The MPE of 3.9 r for a 13 week period was allowed by BuMed for

Operation REDWING was strictly adhered to and there were no instances of overexposure of Task Group 7.3 personnel resulting from participation in the tests. The X-Ray technician on the USS BADOENG STRAIT (CVE-116) received 5.0 r X-Radiation of about 70 KV.

There were two known instances in which individuals did not cover their eyes soon enough or removed their goggles or, uncovered their eyes too soon following the detonation. This was accompanied by pain in the eyes with the development of conjunctivitis in several hours which gradually subsided in 24-48 hours. No apparent permanent eye injuries have resulted.

#### 4.15.5 CONCLUSIONS

1. The health of the task group was excellent.
2. The medical guard was handled in an efficient manner.
3. The medical facilities and supplies in the forward area were adequate.
4. Evacuation of personnel for medical reasons was carried out with no delays.
5. The assignment of a qualified surgeon to the task group has proven very desirable.
6. The sanitary conditions throughout the task group and recreational facilities was satisfactory.
7. The MPE of 3.9 r established by BuMed for Operation REDWING was realistic and strictly adhered to.

#### 4.15.6 RECOMMENDATIONS

1. That a qualified surgeon again be made available on the ship having the best operating room facilities.
2. That the allowance for hospital corps personnel be filled 100 percent prior to departure from the Continental U.S.
3. That the 120 day level for medical supplies as required for Operation REDWING be made a requirement for the next operation.
4. That the strict compliance with current instructions regarding prevention of food poisoning be required of all units.

5. That the personnel assigned to the task group be indoctrinated regarding living in the tropics stressing the necessity for adequate salt and fluid intake.

6. That an adequate X-Ray machine with proper shielding be provided on the ship having the surgical facilities.

7. That an EKG machine be furnished on one of the ships of the task group.

## SECTION 5

### COMMUNICATIONS

#### 5.1 GENERAL

The primary mission of the Communication Section of Task Group 7.3 has been to plan and provide for general communications, including additional and special equipment where necessary, between the ships attached to the task group, as well as to supply Commander Joint Task Force SEVEN and other constituent task groups with adequate communication facilities and services when embarked in units of Task Group 7.3.

#### 5.2 PLANNING

The scope of Operation REDWING, with its inherent large requirement of shipboard electronic modifications and installations, necessarily required a large amount of planning and continued coordination on the part of the Task Group 7.3 Communication Officer with the representative officers of JTF-7 and other task group communication officers, as well as close liaison with the communication officers of the various ships and units of Task Group 7.3. This coordination was particularly important in the field of equipment, its procurement and installation.

##### 5.2.1 CONCLUSIONS

1. It is not sufficient to establish a workable communication plan or to ensure the early placing of equipment orders. The communication officer must ensure close and continued contact with his opposite numbers on other staffs, groups and ships in order that there be no misunderstanding as to requirements, needs, ability to furnish services, or installations (particularly if non-Navy equipment is used).

2. That it is essential to closely follow the status of equipment ordered until one is certain of the receipt and installation of the equipment by the user ship or unit.

3. Although there were some delays in the receipt of equipment and material resulting in the temporary incapacity of one or two units to

participate in early drills or to activate initially all circuits, there were no crippling or permanent effects which resulted from the late delivery of equipment or other material.

#### 5.2.2 RECOMMENDATIONS

1. The Task Group 7.3 Communication Officer should establish a program of coordination and close and continued liaison with his opposite numbers and with the communication officers of the ships of the task group so that he shall have full knowledge of the full requirements which other groups are placing on Task Group 7.3, the efficiency and repair status of currently installed equipment, the status of all equipment orders, the status of new equipment and its installation (particularly if non-Navy), and the status of the communication personnel and their qualifications and training.

2. It is strongly recommended that the communication officer ascertain all frequency assignments at the earliest possible date, with a view towards establishing necessary equipment requirements, and that he furnish these frequencies and equipment requirements to the ships of the task group at the earliest possible opportunity.

#### 5.3 OPERATIONAL COMMUNICATIONS

##### 5.3.1 FREQUENCIES

The basic Communication Annex of CTG 7.3 Operation Order No. 1-56 was entirely adequate. However, with the arrival of all units of the task group in the Pacific Proving Ground and the commencement of the operational phase of Operation REDWING, several specific communication problems developed which merit particular mention.

It is considered that there were far more circuits and frequencies than were necessary for the success of the operation. In some cases, only one of two frequencies assigned to a circuit was used and in others, including circuits which were assigned up to 6 frequencies, the circuits were never used except during test periods.

##### 5.3.2 CONCLUSIONS

1. This defect probably resulted in an increase in the number of

interference problems encountered due to the overcrowding of the "frequency area" assigned to JTF-7.

2. This required the commitment of equipment that otherwise could have been retained as "backups" for the more important circuits.

#### 5.3.3 RECOMMENDATIONS

1. It is strongly recommended that the number of circuits and frequencies be restricted to the minimum necessary to furnish satisfactory and adequate communications.

2. It is recommended that more emphasis be placed on "equipment backups" in preference to "circuit backups" thus ensuring that effective circuits will have necessary equipment available at all times.

#### 5.3.4 SMALL SHIP PERSONNEL

It was believed that some of the smaller ships, which had personnel shortages over which they had no control, would experience some inability to maintain an adequate and continuous 24 hour watch.

#### 5.3.5 CONCLUSION

This shortage of personnel resulted in some delay in the delivery of high precedence traffic to some of the smaller units. This was particularly true in the case of the civilian-manned ships (one operator) (T-LST-306, T-LST-618, and M/V HORIZON).

#### 5.3.6 RECOMMENDATIONS

1. It is recommended that all small ships be assigned three, and preferably four, qualified radio operators prior to embarking on operation of this type.

2. It is additionally recommended that civilian-manned ships be required to furnish at least one, and preferably two, assistant radio operators in order to expedite the receipt of task group messages during other than "one-operator" periods.

#### 5.3.7 FLEET BROADCAST GUARD

The heavy communications requirements placed on the smaller ships required the establishment of an adequate "HR" Fleet Broadcast guardship

arrangement. No major problem arose at Bikini since the USS ESTES (AGC-12) and/or USS DADOENG STRAIT (CVE-116) were almost continually located there. The plan to have the USS ESTES transmit important HR traffic to Eniwetok, however, had to be discarded because of a high traffic load on the Eniwetok common. This imposed an additional burden on the CTG 7.3 Representative communication personnel and the RATT equipped ships located in that area due to a lack of sufficient personnel to take care of the additional work.

#### 5.3.8 CONCLUSION

It is necessary to establish at Eniwetok an adequate Fleet Broadcast guard, with sufficient equipment and personnel to furnish "Fox Skeds" to all non-RATT equipped ships located in the area.

#### 5.3.9 RECOMMENDATIONS

1. It is recommended (if it is not planned to locate one of the larger, RATT equipped ships in the Eniwetok area) that sufficient RATT receiving equipment be located in the CTG 7.3 Representative Communication Center (if this activity is a part of the next operation).

2. In the event that CTG 7.3 Representative Eniwetok is not activated, it is recommended that one of the larger ships which may be scheduled to remain in the Eniwetok area be given sufficient extra RATT equipment and personnel to serve as a guard activity.

#### 5.3.10 TACTICAL AND ADMINISTRATIVE VOICE COMMUNICATIONS

Tactical and administrative voice communications were not reliable, particularly during "shot sorties."

#### 5.3.11 CONCLUSION

This partial lack of success was due chiefly to the employment of AN/FRC 27 and AN/TRC 34 equipment, with its limited range, required sensitive tuning and high maintenance requirements. Due to these reasons, it was at times necessary to use two or three different nets when passing tactical messages to the task group.

#### 5.3.12 RECOMMENDATIONS

1. It is most strongly recommended that the AN/FRC 27 and AN/TRC 34

or similar equipment not be used aboard ship on future operations, particularly on an "all ships" or tactical net.

2. It is recommended that only standard Navy equipment be used for tactical or administrative nets on future operations.

#### 5.3.13 VISUAL COMMUNICATIONS

Visual signaling to pass administrative traffic within the harbor areas was used to a satisfactory degree even though the civilian-manned ships were not capable of standing a signal watch. In spite of this limitation, the use of visual signaling aided in the reduction of the amount of traffic which had to be passed over CW and voice circuits.

#### 5.3.14 CONCLUSION

Visual signaling is definitely of value in reducing radio traffic.

#### 5.3.15 RECOMMENDATIONS

1. It is recommended that visual signaling be used to the greatest possible extent for the transmission of administrative and "all ships" messages so as to leave the radio circuits as free as possible for the transmission of the more important tactical and operational traffic.

2. If at all possible, a signal watch should be stood by the civilian-manned ships in order to clear administrative traffic with as few transmissions as possible and without having to resort to the use of radio circuits.

#### 5.3.16 FLAGSHIP COMMUNICATIONS

Flagship communications were quite satisfactory, both for CTG 7.3 as well as for CJTF-7, when embarked. Early coordination between the staff and the ship effected an efficient traffic routing (NTX) and processing system requiring no major changes throughout the operation. Effective internal routing and processing procedures were established upon the arrival of the staff without entailing any major deviations in normal shipboard routine. At such times as CJTF-7 came aboard, that command established an "AG message processing section" in the JOC spaces. Both on-line and off-line encryption processes were practiced. Messenger service was adequate.

### 5.3.17 CONCLUSIONS

1. Flagship "communications" were adequately organized, trained, and of sufficient scope to serve CJTF-7, CTG 7.3, and the USS ESTES (AGC-12).
2. The use of the ESTES' system of internal routing and processing was the most satisfactory since the ship's personnel were already familiar with that system.
3. The establishment of a CJTF-7 AG section was unnecessary in that it was an additional step of little value and only resulted in an increase in the elapsed time required to completely process a message. In addition the CTG 7.3 staff message center was adequately staffed to furnish all general, and many special communication services to all such groups.
4. The flagship off-line encryption facilities and personnel assigned were more than sufficient to adequately handle all necessary encryption.
5. The on-line encryption facilities proved to be an unnecessary installation.

### 5.3.18 RECOMMENDATIONS

1. It is recommended that the flagship's routing system be used on future operations.
2. It is highly recommended that the CTG 7.3 Staff Communication Center furnish necessary message center services to all groups which may be temporarily aboard the flagship.
3. It is also highly recommended that no on-line encryption facilities be established aboard the CTG 7.3 flagship.
4. An additional recommendation is that messengers be trained to the ends that they become more interested in their particular duty, that they become more cognizant of the content of the messages they carry, and the consequent value of expeditious delivery to the action officer, and that they be made to realize that they, themselves, are a most important cog in the communication "wheel."

### 5.3.19 SCIENTIFIC PROJECT COMMUNICATIONS

Program 2, a scientific project, occupied the Flag Communications spaces

aboard the USS ESTES (AGC-12). Program 2 communications were satisfactory and it is considered that the requirements were met in a satisfactory manner in spite of a limited amount of equipment and frequency difficulty, including interference within the ship (resolved to a degree by obtaining new frequency assignments). The presence of Program 2 aboard the flagship at times hampered the free movement of the ship, necessitated by other requirements, since it was considered essential to remain within a certain radio range of other units associated with the program. Additionally, it was sometimes necessary to temporarily close down primary circuits in order to prevent interference with the reception of necessary information by personnel of the program.

#### 5.3.20 CONCLUSIONS

1. The requirement that flag and USS ESTES (AGC-12) radio personnel man the CW nets of this project placed an added drain on the shipboard operators.
2. The presence of the project aboard the already circuit congested flagship increased the interference problem.
3. The necessity that the project be aboard the flagship is not considered entirely valid in that necessary information could be obtained from flagship sources by means of a radio circuit.

#### 5.3.21 RECOMMENDATIONS

1. It is recommended that if at all possible that Program 2 undertake to provide their own CW and voice radio operators, in addition to other required personnel, in order to prevent an additional drain on the limited number of Navy operators assigned to the ships.
2. It is further recommended that consideration be given to placing Program 2 either on a smaller ship with sufficient electronic and space capabilities or on a ship having less frequency, equipment, and circuit "congestion" than the flagship normally has. It is believed that this move would be beneficial both to Program 2 and to the flagship.

#### 5.3.22 AEROLOGY COMMUNICATIONS

The aerology FAX and RATT communication services, furnished by CTG 7.3 to CJTF-7 were among the more successful.

Initial difficulties experienced with the FAX circuit, which resulted in the poor and non-receipt of weather maps were eliminated when the flagship furnished two units of essential equipment to the CTG 7.2 terminal.

The aerology RATT was operated directly from aerology spaces by weather personnel, which resulted in a reduction of the workload in Radio I and Main Communications, and in addition resulted in the more efficient and expeditious handling of weather traffic. This circuit was transmitted via the twin sideband.

A backup CW weather circuit was established between USS ESTES Radio I and the Parry Island Weather Central.

#### 5.3.23 CONCLUSIONS

1. The above essential services were furnished in a successful and efficient manner once initial equipment difficulties were eliminated.
2. FAX efficiency and success would be increased by the simultaneous transmission and reception on two (high and low) frequencies.
3. The weather RATT would be more efficient and effective if transmitted via a transmitter other than the sideband (discussed in paragraph 5.4.1). It is believed that less outage of this important circuit would thus occur.

#### 5.3.24 RECOMMENDATIONS

1. It is recommended that two frequencies be used in the future on the flagship for aerology FAX.
2. The aerology RATT transmission should be effected via a single channel transmitter vice a multi-channel transmitter.
3. It is recommended that a CW backup weather net be established in the initial operational phase of the operation and that it be activated at all times, and be tested frequently, even though it would not be necessary to man the net continually.
4. It is recommended that "an ESTES-CURTISS (if these ships are used) RATT circuit" (with a monitor machine in the firing bunker) be established and activated during shot periods or as otherwise determined by the JTF-7

aerology group.

#### 5.3.25 VOICE COUNT DOWN TRANSMISSION

In order to ensure reception of the Voice Count Down transmission by all units of the task group, arrangements were made with CTG 7.1 to simultaneously transmit the Voice Count Down via Channel 2A, 168.975 MC, in addition to their own frequency of 154.47 MC and the aircraft frequency of 245 MC. CTG 7.3 transmitters were installed in the USS CURTISS (AV-4) firing room and the tower on Enyu Island. A Voice-Time Script, including safety information was furnished by CTG 7.3 to be read over the ships' PA systems just prior to shot time.

#### 5.3.26 CONCLUSIONS

1. This broadcast was for the most part successful, the degree of success being in direct proportion to the efficiency of the AN/FRC 27-TRC 34 equipment (discussed in paragraph 5.4.4).
2. It is considered unnecessary that this broadcast be transmitted over three separate frequencies.
3. The use of three frequencies resulted in additional maintenance of additional equipment.

#### 5.3.27 RECOMMENDATIONS

1. This broadcast should be transmitted on a single frequency; this frequency should be one which can be received on standard shipboard VHF or UHF equipment, in order to eliminate the need for additional equipment installation.
2. It is recommended that, again, a Voice-Time Script, containing adequate safety information, be broadcast over the individual ships' PA systems prior to shot time.

#### 5.4 EQUIPMENT

##### 5.4.1 SIDEBAND T-276(XC-1)/UR TRANSMITTER

This equipment, a multi-channel transmitter, was installed aboard the USS ESTES (AGC-12) by the Naval Repair Facility, San Diego, California in conjunction with the Collins Radio Corporation, and was the first such

installation aboard a Navy ship.

Upon completion of installation, very successful voice tests were conducted during the first week of January between the ESTES at San Diego and the Signal Corps at Fort Monmouth, N.J. Although plans were made to conduct a teletype test with Fort Monmouth in March, Fort Monmouth was unable to make the necessary arrangements, and no teletype tests were conducted prior to the arrival of the ESTES in the Pacific Proving Ground. Enroute to the Pacific Proving Ground, the ESTES attempted to hold tests with CTG 7.2 at Eniwetok Island, but these attempts were completely unsuccessful.

Upon arrival in the Pacific Proving Ground, it was discovered that the wiring of the two pieces of equipment was incompatible due to the fact that the two units had been wired and installed based on diverse sets of blueprints. A coordinated effort by CTG 7.2, CTG 7.3 personnel and Collins and RCA engineer rectified the error and successful teletype and voice tests were held at Eniwetok. However, when the ESTES moved to Bikini, considerable interference and outage developed. Through the course of the operation much of the interference and outage was reduced by shifting frequencies, removal of all possible sources of interference and increased transmitting power at Eniwetok.

This transmitter was used to simultaneously carry the ESTES-Eniwetok high frequency voice channel, an order wire, a CIC-AOC Eniwetok voice channel, the Sigtot-Samson on-line encryption circuit, the ESTES-Parry Island weather central RATT circuit and the CIC-AOC RATT circuit.

#### 5.4.2 CONCLUSIONS

1. This transmitter proved to be approximately 98 percent efficient for voice transmissions and 85 percent efficient for straight teletype.
2. The chief weakness was experienced in using the sideband in conjunction with Sigtot-Samson on-line encryption, where efficiency was only 35 percent, which must be laid mainly to the extreme sensitivity of the latter equipment.
3. The use of the T276 sideband was a new idea aboard ships and that

the above-described difficulties were somewhat to be expected.

4. The T276, if used again aboard ship, should be restricted to voice communications, with teletype traffic being consigned to other transmitters.

5. It seems unwise, at the current stage "of the proof" of the transmitter to carry so many primary circuits on one transmitter. Even if the outage is only temporary (and at times the outage lasted for several hours) five or six primary circuits are "lost" at once, perhaps at a most critical time in the operation.

#### 5.4.3 RECOMMENDATIONS

1. Based on the performance given during this operation, it is recommended that this transmitter be given further tests and trials (particularly on voice transmissions).

2. It is recommended for eventual Navy use, primarily on voice.

3. Further teletype testing is recommended, but it is not recommended as a practical teletype transmitter (aboard ship) until the many normal interferences experienced aboard ship can be reduced.

4. It is not recommended for use with Sigtot-Samson equipment or other similarly sensitive equipment, particularly aboard ship.

5. It is not recommended that six of the most primary and important circuits be carried on any one such transmitter (aboard ship) at the present stage of development.

#### 5.4.4 AN/FRC 27 AND AN/TRC 34 EQUIPMENT

This equipment, obtained on loan from the Army Signal Corps, was used on the task group primary tactical and administrative nets. This equipment, manufactured by Motorola according to military standards, was used in an attempt to obtain a common channel between all units of the task group, civilian and Navy alike. Commercial Motorola equipment had been used by the task group on previous occasions with considerable success. The TG 7.3 Boat Pool, Bikini, installed most of this equipment on units of the task group, either in the CONUS or in the Pacific Proving Ground.

#### 5.4.5 CONCLUSIONS

1. This equipment did not prove to be the equal, in any respect, of its commercial cousin.

2. The maintenance requirement and tube expenditure both were too high for use on an extended operation.

3. The range and dependability were insufficient for use on a tactical net and/or during shot sorties. The flagship was never able to reach all ships on either the tactical or administrative nets.

4. The critical tuning and continued maintenance required make this equipment a poor choice for use on an operation of this kind. This is particularly true in the case of the smaller ships, to which no electronics technician is attached.

#### 5.4.6 RECOMMENDATIONS

1. It is strongly recommended that equipment of this type not again be installed aboard ships of this task group, on a mass basis, for use on a primary tactical net.

2. It is most strongly recommended that only standard Navy equipment be used on the primary tactical net, and possibly on the primary administrative net.

3. The recommendation is made that some considerable study be given to the possibility of using a proven commercial Motorola model on an administrative net.

#### 5.4.7 SIGTOT-SAMSON EQUIPMENT

Because of the high percentage of encrypted traffic anticipated, based on the experiences of previous similar operations, SIGTOT-SAMSON, an on-line encryption system, was installed aboard the USS ESTES (AGC-12) and USS CURTISS (AV-4) to serve CJTF-7, CTG 7.3, and CTG 7.1. It was planned that this system would carry the major portion of the classified traffic and that it would increase the speed of message handling.

#### 5.4.8 CONCLUSIONS

1. This equipment proved to be extremely sensitive to the existing

ambient noises normally found aboard ship and to the extremely unfavorable atmospheric conditions experienced. This condition was particularly true during the month of May.

2. During May, 256 hours of outage was experienced on this circuit.

3. Numerous reruns (up to 5 on many messages) were required during the worst periods.

4. As a result of the above facts, it is concluded that the SIGTOT-SAMSON equipment is too sensitive and, consequently, not sufficiently efficient for use aboard the average ship.

#### 5.4.9 RECOMMENDATIONS

1. It is highly recommended that SIGTOT-SAMSON equipment not be used again by this task group while aboard ship.

2. Off-line encryption, utilizing CSP 3000 equipment, is considered much more stable and efficient and, with a properly trained cryptoboard, just as rapid a system. It is recommended that such a system be used on the Task Group 7.3 flagship on future operations.

#### 5.4.10 CIPHONY (AFSAY 806 AND 808)

The AFSAY 806 equipment was considered unacceptable because of its poor voice quality. The AFSAY 808, however, proved to be a definite success. This circuit was used to provide a secure voice net between the USS ESTES and Eniwetok and Enyu Islands and was especially valuable for the passing of classified shot information during those periods when CJTF-7 was not aboard the ESTES. This procedure nullified the requirement for standard cryptographic handling since by using this equipment, the necessary advisory messages could be transmitted from Eniwetok. This net was also used by scientific personnel, enabling them to conveniently and securely discuss information pertinent to the shots.

#### 5.4.11 CONCLUSION.

There is a definite need for this type equipment (for use as described above), and the AFSAY 808 very successfully satisfies this need.

#### 5.4.12 RECOMMENDATION

It is recommended that the AFSAY 808 again be installed on the task group flagship.

#### 5.4.13 AN/TRC 1/3 EQUIPMENT (VHF)

This equipment, capable of multi-channel voice and teletype transmissions was installed on the four major ships in order to furnish standard telephone communications (via switchboard) as well as teletype communications. Normally, satisfactory telephone services were obtained within the lagoons. The teletype side was used only between ESTES-CURTISS, on an emergency backup basis, and was not too satisfactory. The VHF range used caused considerable interference with a number of scientific circuits ashore as well as with television reception.

#### 5.4.14 CONCLUSION

The AN/TRC 1 and 3 equipment is not satisfactory for use where the interference-potential (to highly important scientific circuits) is so high.

#### 5.4.15 RECOMMENDATION

It is recommended that AN/TRC 1 and 3 equipment not be used again under similar circumstances. However, it is recommended that a suitable substitute such as the AN/TRC 24 or AN/GRC 10 be considered to supply the communication requirement discussed above.

#### 5.5 CTG 7.3 BOAT POOL COMMUNICATIONS

The boat pool, in addition to fulfilling its primary mission of furnishing water transportation served the task group in several other important ways.

During the planning phase of Operation REDWING, the Task Group 7.3 Boat Pool, while established at the Amphibious Base, Coronado, served as a major coordination unit between the staff and the various units, and played a valuable part in distributing and installing equipment procured for use in the operation.

Upon arrival in the forward area, the Task Group 7.3 Boat Pool served as a major installation agency of equipment for the task group at Bikini, installing and aligning AN/FRC 27's on individual units as they arrived. The boat pool continued to maintain this equipment, when this maintenance was

needed and requested, throughout the entire operation.

In addition, the boat pool furnished essential radio personnel for use in the CTG 7.3 Representative Eniwetok Communication Office.

The communication equipment used by the Task Group 7.3 Boat Pool (chiefly VRC 18 and similar range equipment) was adequate. The over-all boat pool communications were excellent, with practical circuit discipline. Traffic was almost continuous during working hours, but it was never "over-crowded" in spite of the fact that only one frequency was available.

#### 5.5.1 CONCLUSIONS

1. The Task Group 7.3 Boat Pool performed very fine service for the communication section during Operation REDWING.
2. Boat pool communications were excellent; communication equipment adequate.
3. The Task Group 7.3 Boat Pool proved to be a very valuable communication element in the task group during all phases of the operation.

#### 5.5.2 RECOMMENDATIONS

1. It is recommended that in so far as communications are concerned that the Task Group 7.3 Boat Pool should be utilized in a manner similar to that of Operation REDWING.
2. It is also recommended that the communication equipment used by the boat pool again be considered for use in future operations.

#### 5.6 COMMUNICATION PERSONNEL

Close supervision and very careful planning are necessary to properly staff the task group with sufficient qualified communication personnel to adequately and expeditiously process the required traffic. An extended operating period, an increased traffic load, and the requirement to furnish communication and personnel services to Task Group 7.3 as well as the numerous projects, and groups of the other task groups, embarked on Task Group 7.3 ships make it imperative that a sufficient number of personnel be ordered to the ships of the task group to enable them to organize an efficient and completely adequate communication watchbill to guard the necessary task group

circuits.

It is considered that this type operation is one of the most important in which the Navy is participating and the assignment of communication personnel to this task group on a basis of Fleet percentages cannot be fully concurred in.

Although the flagship was successful in obtaining sufficient communication personnel some of the smaller ships arrived in the Pacific Proving Ground with only enough to stand a continuous, qualified watch. This situation was aggravated as the operation progressed with the transfer of personnel on emergency leave, etc.

In addition, the civilian-manned ships arrived in the Pacific Proving Ground in a "one-operator" condition. Further, none of the civilian-manned ships were able to stand a visual signal watch.

#### 5.6.1 CONCLUSIONS

1. Careful planning is essential to the procurement of sufficiently qualified communication personnel.
2. It is essential that sufficient personnel be assigned to all units participating in the operation, for any extended period of time, to ensure an adequate guard and at the same time to permit adequate relief of watchstanders.
3. Insufficient communication personnel are assigned to civilian-manned ships when operating with a Navy task group.

#### 5.6.2 RECOMMENDATION

It is recommended that much consideration be given to the discussion and recommendations above and that an early and energetic effort be made to procure sufficient communication rates at the earliest possible date after the requirements of the operation are known.

#### 5.7 PUBLICATIONS AND CRYPTO

As a result of experience gained from previous operations, it was decided that CTG 7.3 did not require the full allowance of publications set forth in RPS 6(D). Therefore, after careful consideration, a list of necessary

publications to supplement the flagship allowance and to supply CTG 7.3 Representative was requested and obtained from Commanding Officer, U.S. Naval Receiving Station, Washington, D.C. The CTG 7.3 Representative cryptographic requirements were satisfied by requesting, through CJTF-7, that CTG 7.2 supplement its cryptographic holdings on Parry Island to include necessary Navy publications. This procedure eliminated the problem of dual accountability for the cryptographic publications.

All units of the task group were increased to Class Three Afloat status except for three civilian-manned ships which received AFSAM 7 crypto facilities from CTG 7.2.

Providing all ships with the above-described allowances greatly facilitated the ease and speed of delivery of classified messages.

Use of AFSAZ 7301 Tape Readers and Tandem Cables for CSP 2900 equipment increased the speed and efficiency of the Crypto Center sufficiently to cover the traffic load with ease.

#### 5.7.1 CONCLUSIONS

1. It is unnecessary for a flag of this type to draw a full Class 5 allowance of publications.
2. Use of machine systems only by all units greatly increased the ease with which classified messages were handled.
3. Off-line encryption facilities (CSP 2900 and KL 7) were sufficient to handle the encrypted traffic load.

#### 5.7.2 RECOMMENDATIONS

1. It is recommended that either the CTG 7.3 publications should be drawn in the manner described in the first paragraph, above, or that consideration be given to obtaining permission for the flagship to draw a full Class 5 flag allowance. Extra publications could be drawn by the flagship where necessary.
2. Further, it is recommended that the CTG 7.3 Representative (if this activity is reactivated) publications again be drawn by CTG 7.2.
3. The use of the AFSAZ 7301 Tape Readers and Tandem Cables (where

sufficient equipment is available) is recommended for use by all units assigned.

4. The installation of CSP 3000 equipment in the flagship is recommended on future operations in that it would permit the speedy handling of very large amounts of classified traffic with a minimum of delay.

#### 5.8 TRAFFIC ANALYSIS

It was anticipated that the encrypted traffic volume would be extremely high, since such high volumes had been experienced during previous operations. However, this predicted heavy traffic load never developed to any appreciable degree and the traffic load could have been easily processed using standard off-line encryption facilities.

Once the operational phase of the operation was well established, there was a marked decrease in the volume of traffic (on the flagship, a 50 percent decrease was noted from May to June).

A minimum of serious violations (crypto and transmission) was noted. Most violations (voice call sign compromises) occurred over radio telephone and other voice circuits which could not be controlled by communication personnel.

#### 5.8.1 CONCLUSIONS

1. The installation of Sigtot-Samson on-line encryption facilities were unnecessary to handle the encrypted traffic load.

2. The prior establishment of code word lists (designating shot detonation dates) and other simple, short prearranged codes led to a decided decrease in the amount of encrypted traffic.

3. Many of the message texts noted did not rate message handling and should have been "transmitted" in speed letter form via guard mail.

4. Insufficient consideration was given in many cases to the DNC 5A definition of "Priority, Operational Immediate," etc.

#### 5.8.2 RECOMMENDATIONS

1. It is recommended that every effort be made in the future to use "precedence" in a more justifiable manner.

2. The use of code word designators and short, simple prearranged codes is again recommended for use.

3. It is highly recommended that all commands insist on the use of precedence in accordance with the rules set forth in DNC 5A.

Below is a breakdown of traffic (all classifications and precedences) handled by representative units:

Flagship: From 8 April through 1 July, not counting tactical signals and other unrecorded BT type messages not bearing date time groups, the ESTES handled a total of 18,418 messages, for an average of 1,416 per week or 202 per day. Maximum - 2,142 weekly; minimum - 514 weekly. Approximately 7½ percent of this traffic was classified.

CTG 7.3 REP: This activity, between 21 April and 3 July, handled a total of 5,354 messages, for an average of 486 a week. A "high" of 700 messages a week was processed.

An ATF: This ship, between 22 April and 1 July, handled a total of 952 messages for a weekly average of 86 messages.

#### 5.9 CTG 7.3 REPRESENTATIVE COMMUNICATION CENTER

This Communication Center was established in Building 221 on Parry Island to serve CTG 7.3 Representative, Eniwetok, who represented CTG 7.3 in that area.

Personnel assigned to this station were obtained from various sources. An Assistant CTG 7.3 Communication Officer was sent to the Pacific Proving Ground a month ahead of the rest of the staff to arrange for equipment installation and to coordinate communication handling procedures with CTG 7.2 personnel. Initially, five radiomen from the CTG 7.3 Boat Pool, Bikini, were assigned to work the station. This number of men proved inadequate in view of the traffic volume involved and additional personnel were obtained from the YAG's 39 and 40 and the LST-611. These personnel, however, were available only when the operating schedule of the ships permitted the men to be ashore. The DesRon THREE communication officer and one RMC supplemented the above personnel.

Transmitting equipment was assigned to this communication center by CTG 7.2. CTG 7.3, during a previous operation, had obtained from BuShips two

BC 610 transmitters. These two transmitters, retained by CTG 7.2 during interim periods, had been assigned to another group, and CTG 7.3 was assigned two comparable transmitters (T-4's) for use during Operation REDWING. These transmitters were satisfactory. Receiving equipment (6 units-RBA, RBB, RBC), power rectifiers, etc., were furnished by BuShips. Channel 1 and 2 equipment (AN/FRC 27) was furnished by the boat pool, Bikini.

The communication requirements, including equipment, services, and personnel, occasioned by the comprehensive nature of CTG 7.3 Representative, Eniwetok, duties and activities, were greater than had been anticipated. This resulted in a considerable amount of extra work and watches by the limited personnel assigned. In spite of this fact, traffic was processed in an expeditious manner and in general the communication personnel assigned to this station performed their duties in a very fine manner.

#### 5.9.1 CONCLUSIONS

1. Communication services performed by this station were excellent.
2. Although the initial assignment of personnel is considered to have been inadequate, based on the unexpected volume of traffic handled, this station was able to perform its function successfully when augmented by the above-discussed personnel.
3. The true proportions of the amount of work to be performed had not been completely anticipated. This was also true as regards the amount of electronic repair work that had to be performed.

#### 5.9.2 RECOMMENDATIONS

In the event that the CTG 7.3 Representative, Eniwetok, and the communication office which served this command are activated for future operations:

1. It is recommended that the nature and proportions of CTG 7.3 Representative, Eniwetok be more accurately ascertained, and at the earliest possible date, in order that a communication activity completely equal to the task may be fully activated at the very beginning of the operation.
2. Based on Operation REDWING, it is recommended that a minimum of twelve communication rates (7 radiomen, 3 telemen, 2 electronic technicians)

be assigned to this communication station.

3. An assistant CTG 7.3 communication officer should make early trips to the Pacific Proving Ground in order to coordinate communication arrangements with CTG 7.2 and AEC communication personnel.

4. This assistant communication officer should be made completely cognizant of all requirements to be met during the operation, so far as is known, should be advised as to the sources from which he will draw equipment, and should be advised as to the specific personnel that will be assigned to his station.

5. If feasible, the personnel mentioned in paragraph 2 above should be assigned in sufficient time to accompany the assistant CTG 7.3 communication officer when he deploys to the Pacific Proving Ground approximately one month in advance of the balance of the staff.

6. An adequate supply of spare parts must be obtained for this activity.

7. It is recommended that additional space be requested for the electronics repair shop which is considered necessary to the proper functioning of this communication center.