APOLLO 11

PRESS KIT

COMMANDER
MANNED SPACECRAFT RECOVERY FORCE ATLANTIC
NAVAL AIR STATION
NORFOLK, VIRGINIA 23511

MANNED SPACECRAFT RECOVERY FORCE, ATLANTIC
TASK FORCE 140, BUILDING SP-71
U. S. NAVAL AIR STATION
NORFOLK, VIRGINIA 23511

PUBLIC AFFAIRS OFFICE TELEPHONE 444-3608

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	NORFOLK	CHARLESTON	MAYPORT	C. KENNEDY	K.WEST	BERMUDA	SAN JUAN	G. CANARY Is.	RIO DE JANIERO	CAPE VERDE	STATION 1	STATION 2	STATION 3
NORFOLK		386	532	586	863	683	1252	3130	4723	3100	640	1605	3820
CHARLESTON	386		163	258	573	767	1138	3341	4717	3165	578	1705	3780
MAYPORT	532	163		123	450	835	1111	3457	4740	3290	622	1775	3760
C. KENNEDY	589	258	123		320	840	973	3378	5057	3320	565	1720	3700
K. WEST	863	573	450	320		1093	966	3545	4560	3399	674	1812	4060
BERMUDA	683	767	835	840	1093		856	2548	4110	2410	375	963	3060
SAN JUAN	1252	1138	1111	973	966	856		2770	3652	2460	600	1020	2860
G. CANARY Is	3130	3341	3457	3378	3545	2548	2770		3713	750	2842	1875	1800
RIO DE JANIERO	4723	4717	4740	5057	4611	4110	3652	3713		2540	4440	3310	1830
CAPE VERDE	3100	3165	3290	3320	3399	2410	2460	750	2540		2660	1575	970
STATION 1	640	578	622	565	674	375	600	2842	4440	2660		1165	3010
STATION 2	1605	1705	1775	1720	1812	963	1020	1875	3310	1575	1165		2050
STATION 3	3820	3780	3760	3700	4060	3060	2860	1800	1830	970	3010	2050	

End-of-Mission for 24 July

	Midway	Wake	Honolulu	Johnston	PRS
Midway Island		1035	1160	800	1100
Wake Island	1035		1970	1340	1320
Honolulu	1160	1970		700	1040
Johnston Island	800	1340	700		390
PRS (HORNET)	1100	1320	1040	390	

End-of-Mission for 26 July

	Midway	Wake	Honolulu	Johnston	PRS
Midway Island		1035	1160	800	275
Wake Island	1035		1970	1340	1065
Honolulu	1160	1970		700	960
Johnston Island	800	1340	700		540
PRS (HORNET)	275	1065	960	540	

End-of-Mission for 29 July

	Midway	Wake	Honolulu	Johnston	PRS
Midway Island		1035	1160	800	140
Wake Island	1035		1970	1340	1045
Honolulu	1160	1970		700	1060
Johnston Island	800	1340	700		800
PRS (HORNET)	140	1045	1060	800	

NAVY MANNED SPACECRAFT RECOVERY

The critical importance and impressive extent of U.S. Navy Support of America's Manned Space Flight program is best illustrated by the total of more than 200 individual ships, and numerous aircraft squadrons and underwater demolition teams employed to date in world-wide spacecraft recovery duties. These units were assigned to U.S. Navy Manned Spacecraft Recovery Forces, Task Force 140 in the Atlantic and Task Force 130 in the Pacific.

Recovery ships are required on station prior to each mission and remain on station until spacecraft splashdown unless an earlier release is warranted. Although recovery of manned flights receives the most publicity, Navy forces also have primary responsibility for numerous unmanned spacecraft launches which provide essential scientific data prerequisite to attainment of America's space goals. Safety of spacecraft personnel being of prime importance, manned spacecraft recovery is an exacting and demanding evolution which requires well equipped and trained crews.

Rear Admiral Philip S. McManus, USN, as Commander Manned Spacecraft Recovery Force, Atlantic (Commander Task Force 140) is responsible for the coordination, training and control of ships and units assigned for each mission by Commander-in-Chief, U.S. Atlantic Fleet. Rear Admiral Donald C. Davis USN, has the same responsibility for units in the Pacific.

A period of indoctrination and equipment installation, familiarization and training in spacecraft recovery is provided after the units have been designated. The indoctrination and training required varies with each unit since they may be veterans of previous missions. As an example, two of the Atlantic fleet ships assigned for the Gemini 12 mission were on their first recovery assignment while the USS WASP was on her fifth recovery mission.

The Atlantic and Pacific Task Forces are an important part of the world-wide Department of Defense Manned Space Flight Recovery Organization. Directing all elements of this multi-service recovery team is the acting DOD Manager, Major General David M. Jones, U.S. Air Force, who sits next to the NASA Mission Director in Mission Control Center during the period of each space flight. Throughout the mission General Jones maintains direct communication with recovery force commanders and, working in concert with the Mission Director, recommends to the force commander action required to effect timely recovery of the capsule.

Preparatory to each space mission Navy recovery forces assume designated area readiness stations. With responsibility for coordination of Atlantic Command area recovery operations, Rear Admiral McManus (Rear Admiral Davis in the Pacific) and his staff guide operations from a newly constructed Recovery Control Center, Atlantic at the Naval Air Station, Norfolk. During the pre-launch and mission flight period, staff personnel maintain 24-hour surveillance of the position and readiness of all recovery forces, the spacecraft mission progress and weather conditions in the primary and contingency recovery areas. Direct communications maintained with all assigned Atlantic and Pacific recovery units and the DOD Manager at

Mission Control at Houston enable Admiral McManus and Admiral Davis to immediately and effectively react to recovery requirements.

The initial stations occupied by recovery ships are located along the ground track which the spacecraft will follow between lift-off and orbital insertion. The stations are changed as necessary during subsequent orbits to keep the ships in the best position for astronaut and spacecraft recovery. An example for the necessity of changing recovery areas was demonstrated during Apollo 9 when bad weather forced NASA to add an additional orbit to the mission and land the command module some 400 miles south of the intended splashdown point. The re-entry and splashdown accuracy obtained in the Apollo 4, 6, and 7 flights permitted the release of some recovery ships after earth orbit insertion and on Apollo 8 and 10 after translunar injection.

Spacecraft and astronaut recoveries have been accomplished by individual ships or a combination of UDT swimmers-aircraft-ship. In the past some astronauts have left the spacecraft and ridden a helicopter to the recovery ship while others have remained in the spacecraft until it was hoisted aboard the recovery ship.

Recovery force operations continue even after delivery of the astronauts to their base. The spacecraft is delivered to a point designated by NASA officials and recovery equipment is returned and repositioned in preparation for the next mission. At times the tempo of our space efforts has resulted in recovery forces being deployed in support of simultaneous missions.

The success of our space program is directly related to the Navy's outstanding efficiency in astronaut and spacecraft recovery. This capability in recovery procedures is well established through exacting attention to requirements and has resulted in a continuing period of successful recoveries. Naval forces will continue to provide this same professional level of support for forthcoming Apollo missions.

POSSIBLE CONTINGENCY LANDING SITUATIONS

The following sections describe special procedures that may be used to safely return the spacecraft to earth following situations that would prevent the space vehicle from following its nominal flight plan:

1. Launch Phase

(a) Mode I: This procedure is designed for safe recovery of the CM following aborts occurring from the time the launch escape system is activated at T-30 minutes until the launch escape tower is jettisoned at approximately 3 minutes after launch. The procedure would consist of the launch escape tower pulling the Command Module (CM) off the space vehicle and propelling it a safe distance down range. The resulting landing point would lie between the launch site and approximately 520 miles down range.

(b) Mode II: This abort could be performed from the time of jettisoning the launch escape tower until the CM landing point is 3,200 nautical miles down range, approximately 10 minutes after liftoff. The procedure would consist of separating the command and service module (CSM) combination from the launch vehicle, separating the CM from the service module, and then letting the CM free fall to entry. The resulting landing point would be from 440 to 3,200 nautical miles down range on ground track.

(c) Mode III: This abort procedure could be performed from the time the full-lift landing point reaches 3,200 nautical miles until orbital insertion. The procedure would consist of separating the command/service module combination from the launch vehicle and then, if necessary, performing a retrograde burn so that the half-lift landing point is no farther than 3,350 nautical miles down range. A half-lift entry would place the landing point approximately 70 nautical miles south of the ground track between 3,000 and 3,500 nautical miles down range.

(d) Mode IV: This mode of abort is preferred over the Mode III abort and would be used unless an immediate return to earth is necessary during the launch phase. The procedure would be to maneuver the spacecraft into a parking orbit and could be performed anytime after the SPS has the capability to insert the CSM into orbit. This capability begins at approximately 10 minutes after liftoff.

After insertion into orbit, the CSM could be scheduled for an earth orbital mission, or, if necessary, be returned to earth in the West Atlantic or Central Pacific after one revolution.

2. Earth Parking Orbit

Once the CSM/SIVB is safely inserted into earth parking orbit, a return-to-earth orbit would be performed by separating the CSM from the 3rd stage S-1VB and then performing an SPS retrograde burn to return the CM to earth. The crew would perform a guided entry to a pre-selected target point if possible.

3. Translunar Injection (TLI)

(a) Ten Minute Abort: There is only a remote possibility that an immediate return to earth will become necessary during the five-minute TLI maneuver. However, if it did become necessary, the S-1VB burn would be cut off early and the crew would initiate an onboard calculated retrograde SPS abort burn. The SPS burn would be performed approximately 10 minutes after TLI cutoff and would ensure a safe CM entry. The elapsed time from abort initiation to landing would vary from approximately 25 minutes to 4 hours, depending on the length of the TLI maneuver performed prior to S1VB cutoff. Since this abort would be used only in extreme emergencies with respect to crew survival, the landing point would not be considered in executing the aborts. For aborts initiated during the latter portion of TLI, a second SPS burn called a mid-course correction could be used to reach a preferred landing area.

(b) Ninety-Minute Abort: This situation is more probable than the TLI abort. After the TLI maneuver, the crew would check any malfunctions that may have developed during the burn. If, after the check, it became apparent that it was necessary to return to earth, an abort procedure specifying an SPS burn at a certain CSM attitude would be sent to the crew. The abort would be initiated at approximately TLI cutoff plus 90 minutes and would be targeted to a pre-selected landing location - called a recovery line.

4. Translunar Coast

During the three days of translunar coast, the abort procedure would be similar to the 90 minute abort. Abort information specifying a combination of SPS burn time and CSM attitude would be sent to the crew to be performed at a certain time. The abort would be targeted for a landing on one of the five recovery lines, preferably the Mid-Pacific Line, the other lines being in order of priority, the Atlantic Ocean line, the East Pacific or West Pacific lines, and the Indian Ocean line.

5. Lunar Orbit Insertion

Aborts following an early shutdown of the SPS during the Lunar Orbit Insertion (LOI) maneuver are divided into categories, Mode I, Mode II and Mode III. Aborts performed during LOI will normally return the CM to the Mid-Pacific recovery line.

(a) Mode I: This procedure would be used for aborts following SPS shutdowns from ignition to approximately 2 minutes into the LOI burn. The maneuver would consist of performing a postgrade DPS burn 2 hours after cutoff to put the CSM back on a return-to-earth trajectory.

(b) Mode II: This procedure would be used for aborts following shutdown between LOI ignition plus 3 minutes. The first DPS burn would reduce the lunar orbital period and the second DPS burn would place the spacecraft on a return-to-earth trajectory targeted to the Mid-Pacific recovery line.

(c) Mode III: After 2 minutes of LOI burn, the CSM will have been inserted into an acceptable lunar orbit. Therefore, the abort procedure would be to let the spacecraft go through one or two lunar revolutions prior to doing a posigrade SPS burn at Pericynthian. This would place the return-to-earth trajectory targeted to the Mid-Pacific recovery line.

6. Lunar Orbit

Aborts from lunar orbit would be accomplished by performing the transearth injection (TEI) burn early. The abort would be targeted to the Mid-Pacific recovery line.

7. Lunar Landing

The landing phase begins at a point called the "low gate" some 2 nautical miles east and 500 feet above the lunar landing site. This phase is designed specifically for pilot control and provides the capability for a visual assessment of the landing site. The vertical descent will start at an altitude of about 77 feet and end at lunar surface touchdown. After a lunar stay of approximately 22 hours, the LM ascent propulsion system will be used to place the two-man ascent stage in a 9 by 45 nautical mile lunar orbit coplanar with the CSM 60 nautical mile circular orbit. The descent stage of the LM will serve as the launch platform for the ascent stage and will remain on the lunar surface. The LM and the CSM will rendezvous and prepare for the transearth injection and the return to earth.

8. Transearth Injection

The abort procedures for early cutoff of TEI are the inverse of the LOI abort procedures. That is, for early cutoffs between TEI ignition and approximately 2 minutes, a Mode III abort would be performed. After this time a Mode I abort would be used. All TEI aborts should result in landings on the Mid-Pacific recovery line.

9. Transearth Coast

From TEI until entry minus 24 hours to splashdown, the only abort procedure that could be performed is to use the SPS or the SM/reaction control system for a posigrade or retrograde burn that will decrease the transearth flight time and change the longitude of landing. During and shortly after TEI, the CSM will have the capability to decrease transearth coast by 24 hours, but this capability decreases as the CSM nears earth. After entry minus 24 hours, no further burns will be performed. This is to ensure that the CM maintains the desired entry velocity and flight path angle combination that will allow a safe entry.

10. Entry

If the guidance and navigation and control system fails, a guided entry to the end-of-mission target point may not be flown. In this case, the crew would use their entry monitoring system (EMS) to fly to a landing that would be abeam the guided entry target point on the North side of the ground track.

ALTERNATE MISSIONS:

There are four types of alternate missions that may be performed during the Apollo 11 flight. They are:

(1) Low Earth Orbital Mission
(2) High Apogee Earth Orbital Mission
(3) CSM/LM Lunar Flyby Mission
(4) CSM Only Lunar Orbital Mission

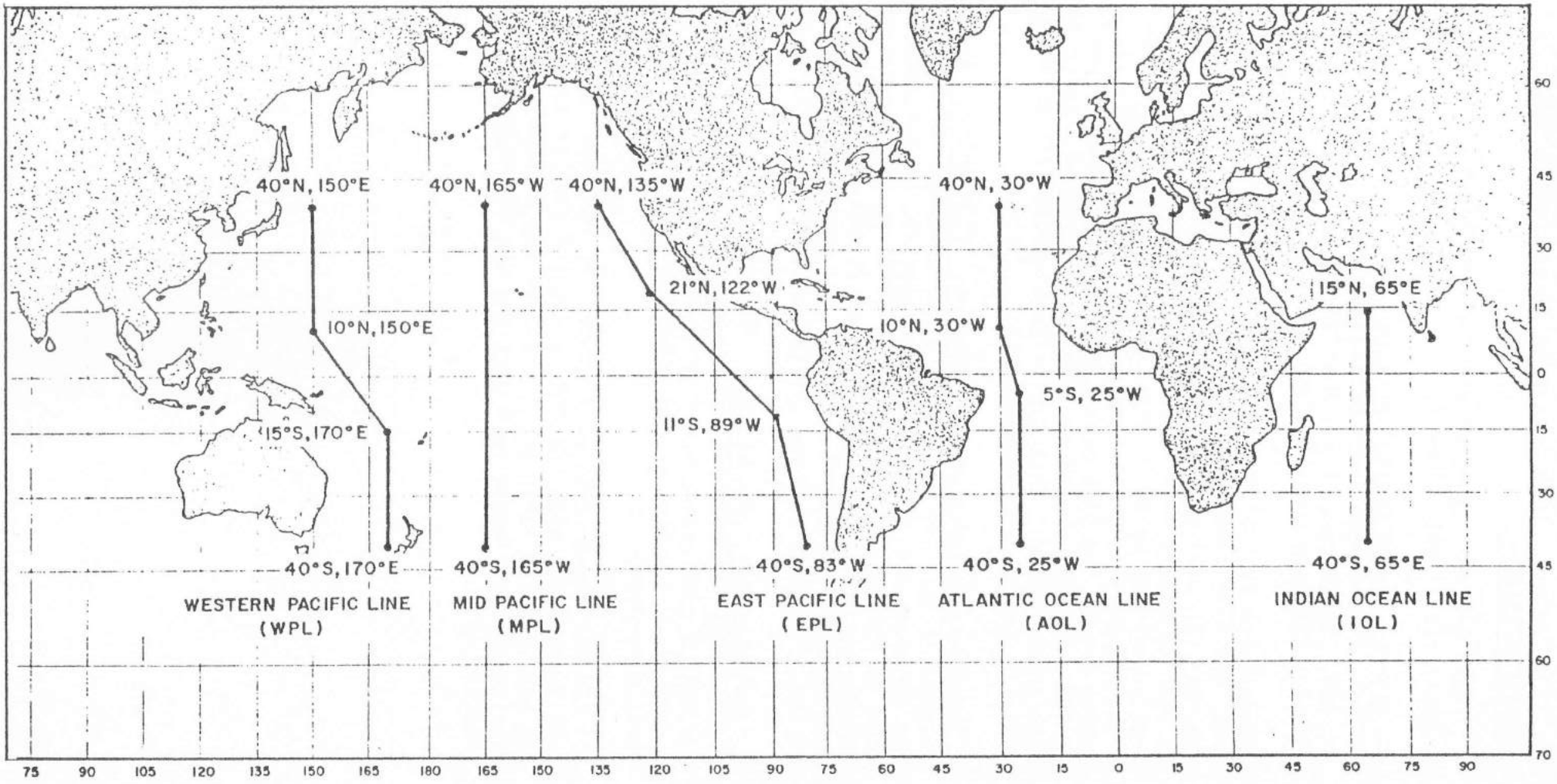
1. Low Earth Orbital Mission: (CSM only): If, after reaching earth parking orbit, the S1VB cannot be used for TLI and the LM cannot be ejected from the S1VB, the CSM will go through a lunar mission timeline in low earth orbit. The CSM trajectory will be kept below 400 nautical miles and the mission duration will be up to 10 days. The landing point for this mission will be in the Mid-Pacific Ocean near Hawaii. (CSM and LM) If, after reaching earth parking orbit, the S1VB cannot be used for TLI or can perform only part of the TLI maneuver, the LM would be ejected and a mission similar to Apollo 9 would be performed. This type mission would last up to 10 days with landing of the CM in the Mid-Pacific Ocean.

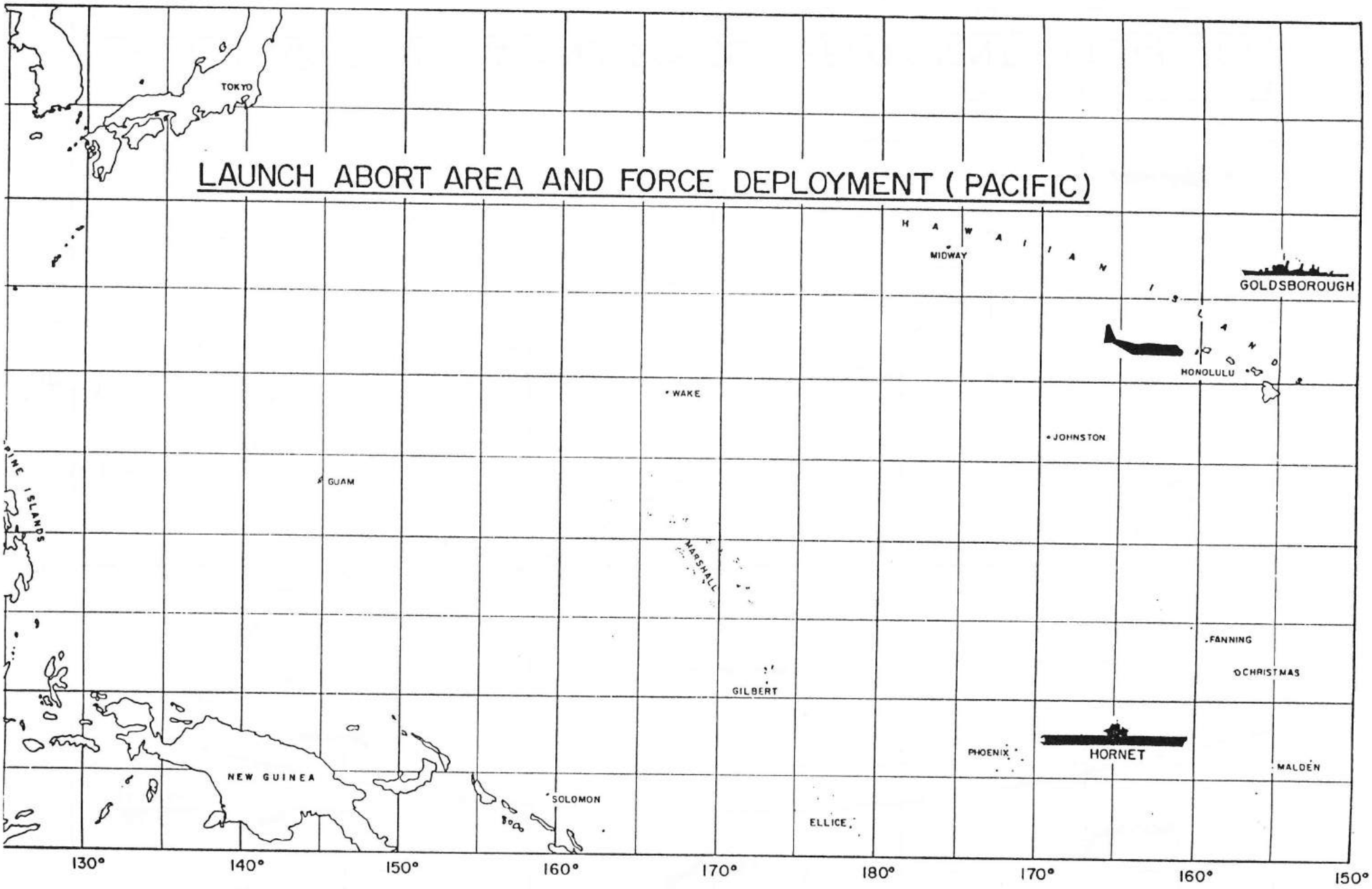
2. High Apogee Earth Orbital Mission: (CSM only): If there is a premature shutdown of the S1VB during TLI after an apogee of 25,000 nautical miles has been achieved and the LM cannot be ejected, a high apogee earth orbital mission would be performed. (CSM and LM) If there is a premature shutdown of the S1VB during TLI (apogee greater than 25,000 nautical miles) and the LM can be ejected, a series of DPS and APS burns would be performed prior to the time the SPS would be used to place the CSM/LM into a semi-synchronous orbit.

3. CSM/LM Lunar Flyby Mission: If, after TLI, the LM can be ejected from the S1VB but the SPS does not have enough fuel to commit the CSM to lunar orbit the CSM/LM combination would perform a lunar flyby mission. The flyby mission would have a duration of approximately 7 days and the CM would land on the Mid-Pacific recovery line.

4. CSM Only Lunar Orbital Mission: If for some reason the LM cannot be put into lunar orbit with the CSM, a mission similar to Apollo 8 would be performed The stay time in lunar orbit would be approximately 50 to 60 hours. The total mission duration would be 8 days and the CM would land on the Mid-Pacific recovery line.

LUNAR MISSION RECOVERY LINES




LAUNCH ABORT AREA AND FORCE DEPLOYMENT (PACIFIC)
TOKYO
HAWAIIAN ISLANDS
MIDWAY
GOLDSBOROUGH
HONOLULU
WAKE
JOHNSTON
GUAM
MARSHALL
GILBERT
FANNING
CHRISTMAS
PHOENIX
HORNET
MALDEN
NEW GUINEA
SOLOMON
ELLICE
130°
140°
150°
160°
170°
180°
170°
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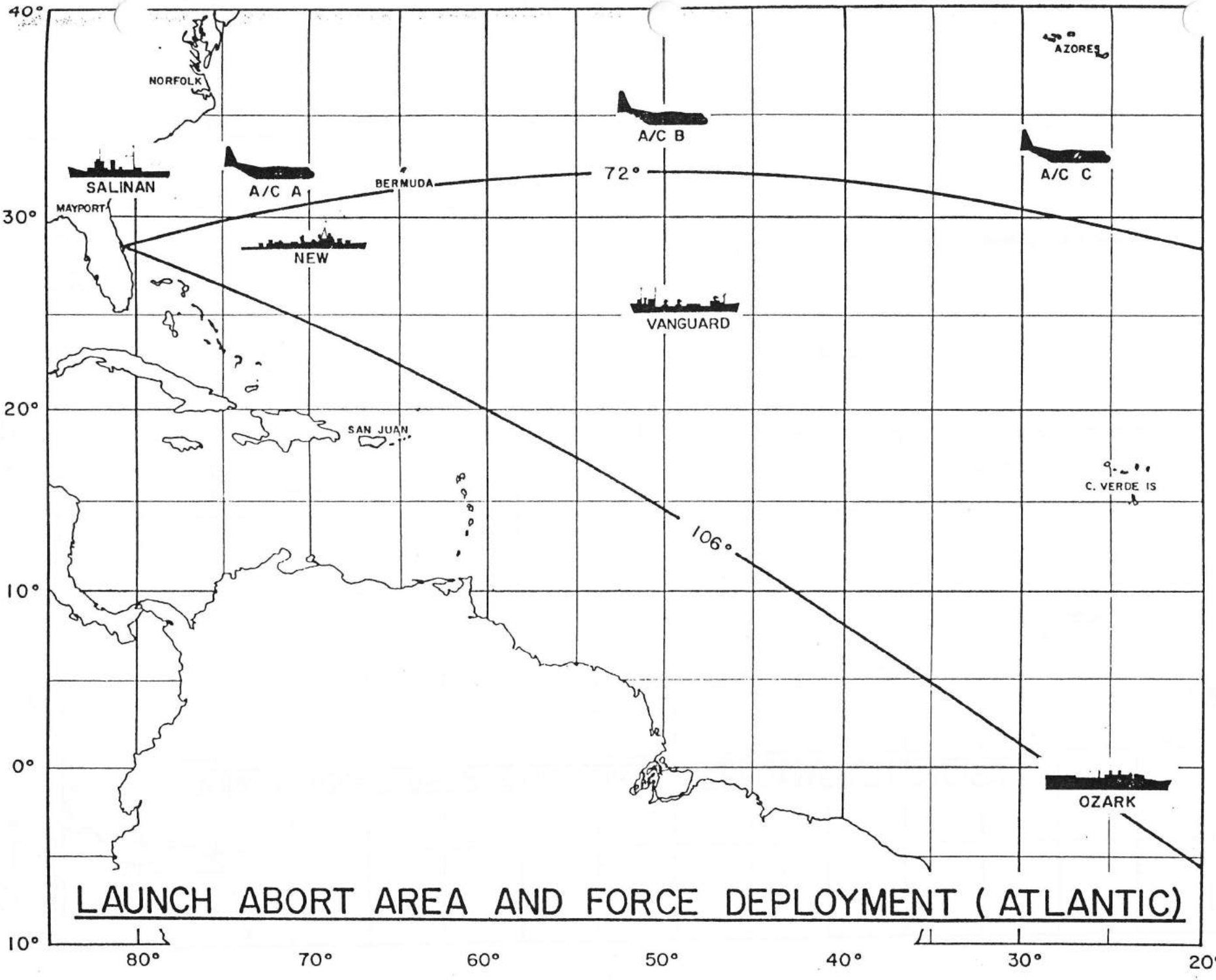
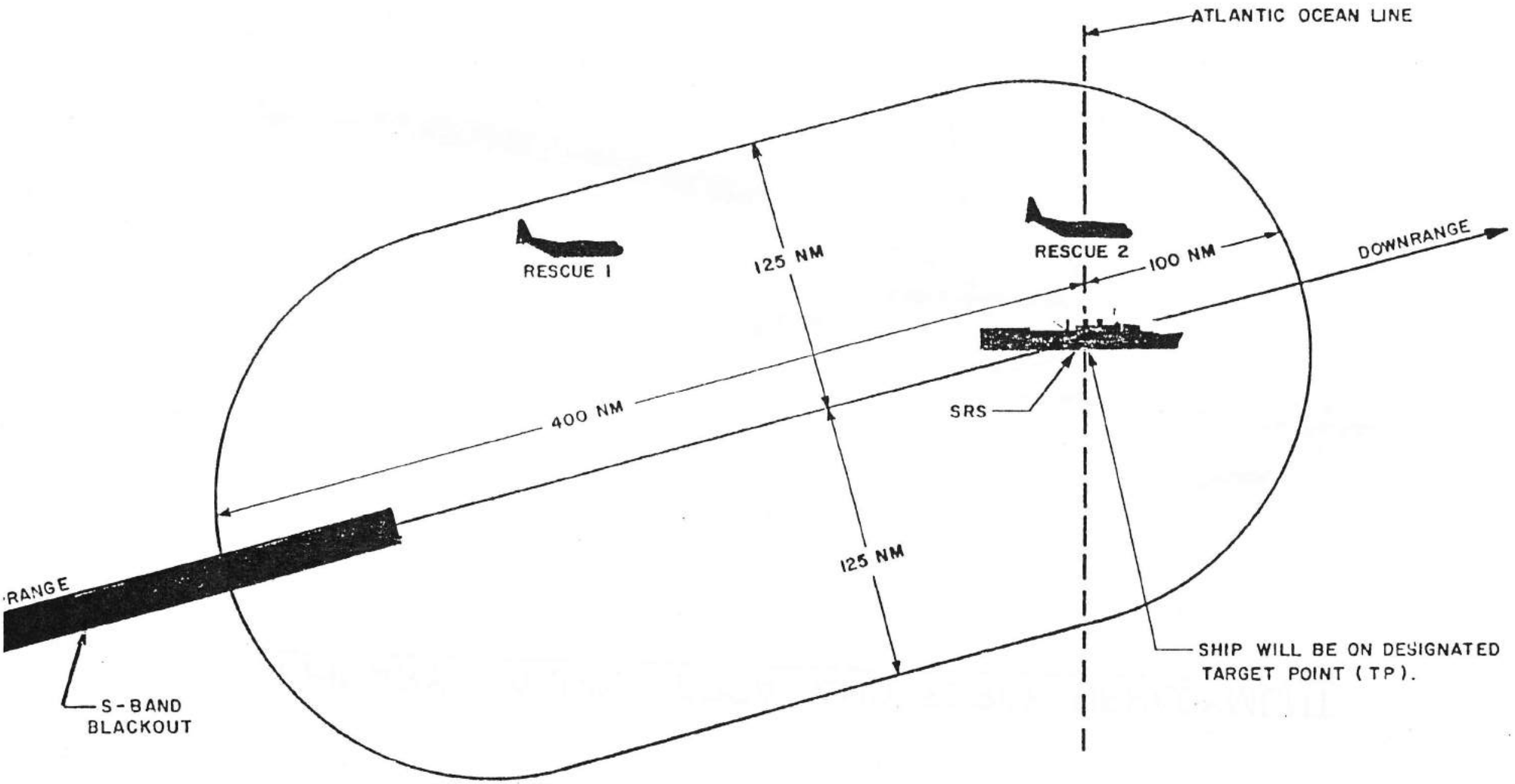
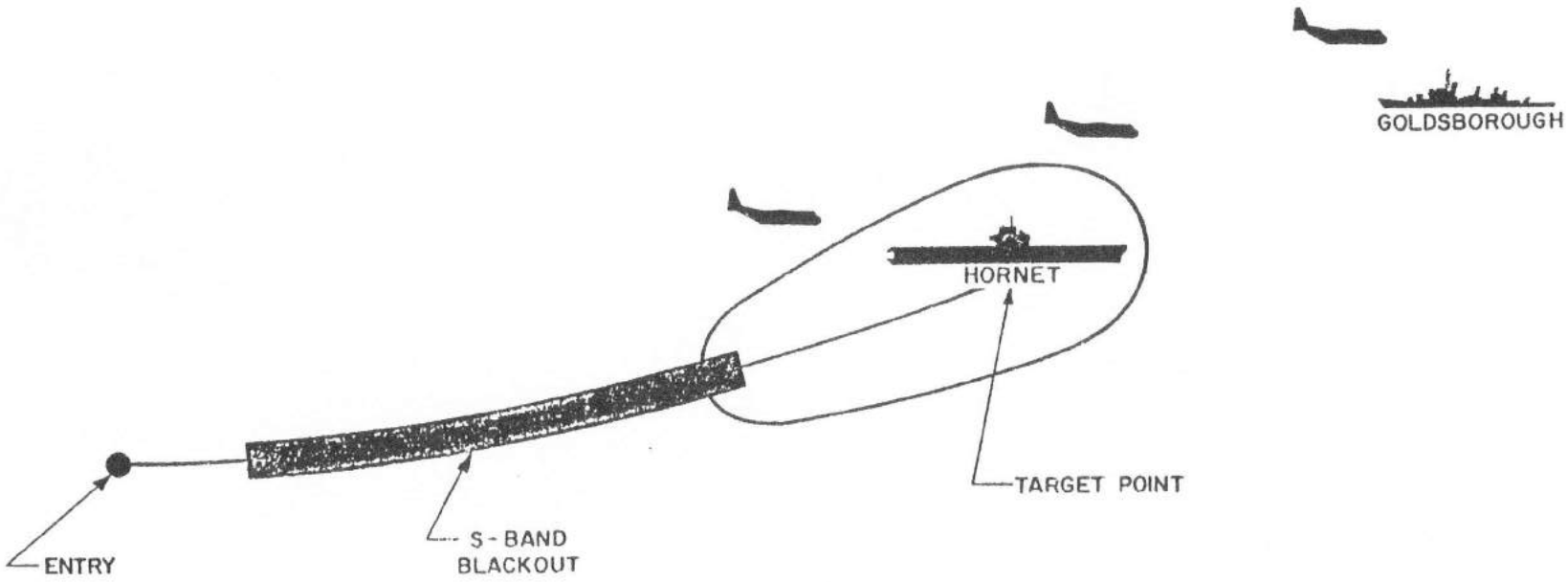


LAUNCH ABORT AREA AND FORCE DEPLOYMENT (ATLANTIC)

SECONDARY LANDING AREA AND FORCE DEPLOYMENT



PRIMARY LANDING AREA AND FORCE DEPLOYMENT



MANNED FLIGHT RECOVERY CHRONOLOGY

MISSION #	RECOVERY DATE	PILOT(s)	RECOVERY SHIP	OCEAN
Mercury				
MR-3	5 May 1961	Alan B. Shepard, Jr.	LAKE CHAMPLAIN CVS-39	Atlantic
MR-4	21 Jul 1961	Virgil I. Grissom	RANDOLPH CVS-15	Atlantic
MA-6	20 Feb 1962	John H. Glenn	NOA DD-841	Atlantic
MA-7	24 May 1962	M. Scott Carpenter	PIERCE DD-753	Atlantic
MA-8	3 Oct 1962	Walter M. Schirra, Jr.	KEARSARGE CVS-33	Pacific
MA-9	16 May 1963	L. Gordon Cooper, Jr.	KEARSARGE CVS-33	Pacific
Gemini				
GT-3	23 Mar 1965	Virgil I. Grissom John W. Young	INTREPID CVS-11	Atlantic
GT-4	7 Jun 1965	James A. McDivitt Edward H. White	WASP CVS-18	Atlantic
GT-5	29 Aug 1965	L. Gordon Cooper, Jr. Charles Conrad, Jr.	LAKE CHAMPLAIN CVS-39	Atlantic
GT-6	16 Dec 1965	Walter M. Schirra, Jr. Thomas P. Stafford	WASP CVS-18	Atlantic
GT-7	18 Dec 1966	Frank Borman James A. Lovell, Jr.	WASP CVS-18	Atlantic
GT-8	16 Mar 1966	Neil A. Armstrong David R. Scott	LEONARD MASON DD-852	Pacific
GT-9	6 Jun 1966	Thomas P. Stafford Eugene A. Cernan	WASP CVS-18	Atlantic
GT-10	21 Jul 1966	John W. Young Michael Collins	GUADALCANAL LPH-7	Atlantic
GT-11	15 Sep 1966	Charles Conrad, Jr. Richard Gordon, Jr.	GUAM LPH-9	Atlantic
GT-12	15 Nov 1966	James A. Lovell, Jr. Edwin E. Aldrin, Jr.	WASP CVS-18	Atlantic

MISSION #	RECOVERY DATE	PILOT(s)	RECOVERY SHIP	OCEAN
Apollo				
AS-205 Apollo 7	22 Nov 1968	Walter M. Schirra, Jr. Donn F. Eisele Walter Cunningham	ESSEX CVS-9	Atlantic
AS-503 Apollo 8	27 Dec 1968	Frank Borman James A. Lovell, Jr. William A. Anders	YORKTOWN CVS-10	Pacific
AS-504 Apollo 9	13 Mar 1969	James A. McDivitt David R. Scott Russell L. Schweickart	GUADALCANAL LPH-7	Atlantic
AS-505 Apollo 10	26 May 1969	Thomas P. Stafford John W. Young Eugene A. Cernan	PRINCETON LPH-5	Pacific

HISTORY
TASK FORCE 140

The U.S. Navy has been an important participant in America's space program since it began in 1958. For a variety of cogent safety and cost reasons, the United States space program has been and is predicated on the concept of at-sea landing and recovery of astronauts and their spacecraft. The Navy has logically been selected to provide this support since it is the sole U.S. military force possessing the necessary capability to perform at-sea recoveries under all circumstances.

This vital role in support of the NASA directed manned space program has been successfully completed for the Mercury and Gemini series and continues in the current Apollo space program.

Navy recovery forces in the Atlantic and Pacific report to the Department of Defense Manager for Manned Space Flight Support for recovery duty 24-hours prior to each launch. Ships and aircraft of each force are assigned for the duration of each specific mission. From Mission Control Center, Houston, Texas, the DOD Manager exercises overall coordination of the world wide deployment of military recovery forces based on NASA supplied information and advice.

Both Atlantic and Pacific Recovery Forces are commanded by Navy officers. These officers direct all assigned recovery forces in their area of responsibility to meet mission requirements established by the DOD Manager.

The Atlantic Task Force One Forty responsibilities are full time since the Force Commander also functions as the Navy Deputy to the DOD Manager and is the Chief of Naval Operations Representative for Manned Space Flight Support matters. These duties involve continuous liaison with other commands and NASA in matters concerning Navy support of the Manned Space Program.

Command of the Atlantic recovery forces was originally an additional duty assigned to Commander, Destroyer Flotilla FOUR. The increased tempo and complexity of the space effort during the Gemini program necessitated establishment of the present specialized, dedicated force working full time to meet additional demands imposed on the Navy. In response, CNO authorized Task Force 140 as a separate organization under the command of Rear Admiral William C. Abhau on November 26, 1965.

During the final days of 1965, TF-140 conducted recoveries of two Gemini missions. On 4 December, astronauts LT COL Frank Borman, USAF, and CDR James A. Lovell, Jr., USN, were launched on a 14-day mission ending in the Atlantic with recovery by the USS WASP (CVS-18). On 15 December, astronauts CAPT Walter M. Schirra, Jr., USN, and MAJ Thomas P. Stafford, USAF, were launched on a one day mission and were again recovered in the Atlantic by the USS WASP.

1966 was a year of continued growth of the United States' Space Program. The Navy continued its important role in recovery operations. The first

unmanned Apollo missions were conducted successfully and the Gemini program was completed in November. There were five manned Gemini flights, two unmanned Apollo flights and the unmanned Titan IIIC/Heat Shield Test flight; all supported by recovery forces assigned to CTF-140.

Improved recovery techniques and the continued success of the Gemini program enabled a reduction in the number of ships deployed in the Atlantic during each mission. The number of TF-140 staff personnel who deployed during each mission to Cape Kennedy to man the Recovery Control Center and News Center, and to Houston, Texas, to man the News Center remain approximately the same as for missions in 1965.

The first mission of 1966 was the unmanned suborbital flight of AS-201. After a three-day delay due to weather conditions, launch was made on 26 February and the mission was successfully terminated by a splashdown and recovery in the Ascension Island area of the South Atlantic.

Gemini 8 was launched on 16 March. This mission resulted in a contingency landing in the Western Pacific Recovery Area but prompt action by Department of Defense forces resulted in successful recovery.

The original launch date for Gemini 9 was 17 May, but when the Agena target vehicle failed to enter orbit the mission was rescheduled as Gemini 9A for 3 June. It was a three-day flight which splashed down on 6 June only 2.5 nautical miles from the primary recovery ship, USS WASP. Splashdown and recovery were seen by a nationwide audience on live television from the deck of the WASP.

Gemini 10 was launched on 18 July and was successfully recovered on 21 July. Only five ships were deployed in the Atlantic for this mission. It was the fewest number of ships used on any manned spaceflight to date.

The second flight in the Apollo series, AS-202, was an unmanned, suborbital flight to evaluate the launch vehicle and heat shield before scheduling a manned Apollo flight. It was launched on 25 August and recovered in the Pacific on the same day as scheduled.

Gemini 11 was a three-day flight launched on 12 September. Gemini 12 was a four day flight which was launched on 11 November and concluded the Gemini series.

Between the Gemini 11 and 12 missions, units of Task Force 140 recovered an unmanned Gemini spacecraft which was launched by a Titan IIIC rocket on 3 November. This was a suborbital flight which splashed down in the South Atlantic. The main purpose of this mission was to test the heat shield during reentry.

1967 was a year of operational reviews and training for Manned Spacecraft Recovery Force, Atlantic. After an unfortunate fire that took the lives of three astronauts in January, the unmanned Apollo 4 (AS-501) mission was rescheduled for April 1967, but further delayed as a result of technical difficulties until finally launched on November 9. Apollo 4 was recovered in the Pacific by the USS BENNINGTON (CVS-20).

On May 26, Rear Admiral Thomas A. Christopher relieved Rear Admiral William C. Abhau, as Commander Manned Spacecraft Recovery Force, Atlantic (CTF-140).

On July 1, the command was designated a shore duty billet for assigned personnel.

In August, construction of Recovery Control Center, Atlantic began in the headquarters of Commander Manned Spacecraft Recovery Force at NAS Norfolk, Va.

On November 2, Commander Task Force 140 and his operational staff deployed to Cape Kennedy, Florida, for the Apollo 4 launch. Recovery units for this first launch of the Saturn V launch vehicle included: USS AUSTIN (LPD-4); USS JOSEPH P. KENNEDY (DD-850); USS HOIST (ARS-40); USS YORK COUNTY (LST-1175); and USS SABINE (AO-26), along with five helicopters of Helicopter Antisubmarine Squadron 11; six swimmers from Underwater Demolition Team 21 and an RA3B aircraft from Heavy Attack Photo Squadron 62. The launch was made on November 9 and the command module was recovered in the Pacific Recovery Area by the USS BENNINGTON (CVS-20).

In addition to a possible Apollo 4 command module recovery due to mission abort, AUSTIN, with her assigned helicopters and underwater swimmers, was assigned the task of retrieving two camera cassettes and any pieces of the burned-out first stage rocket booster surviving ocean impact. The camera cassettes were ejected from the Saturn V vehicle shortly after photographing the separation of the first stage rocket booster from the second. Both camera cassettes were recovered intact and several fragments of the booster were successfully retrieved for NASA engineers to evaluate.

Immediately after completion of the Apollo 4 flight, the Recovery Control Center at Cape Kennedy, Florida, was deactivated and installed equipment removed to Norfolk for installation in Recovery Control Center, Atlantic. All space flight recovery operations scheduled for the Atlantic Command area are now directed from Norfolk.

The Recovery Control Center, Atlantic, was completed in late January and was dedicated by Commander-in-Chief, U.S. Atlantic Fleet on 1 February 1968. It is located in the headquarters building, SP-71, Naval Air Station, Norfolk.

Apollo 5 was launched from Cape Kennedy on 9 February 1968. This mission launched an unmanned, non-recoverable Lunar Module into orbit using an uprated Saturn I booster. USS PAIUTE (ATF-159) was deployed to Mayport, Florida for possible ocean salvage operations in the event of a mission abort in the waters adjacent to the launch site area. PAIUTE was released following the successful launch of Apollo 5.

Quarterly Apollo boilerplate recovery training exercises were conducted in the Virginia Capes Area during the week of 19-23 February. These exercises provided training to participants and provided background data for improving recovery techniques. Atlantic participants in the exercise were: USS FURSE (DD-882); USS YORK COUNTY (LST-1175), a four plane detachment from

Helicopter Antisubmarine Squadron 5, three swimmer teams from Underwater Demolition Team 21, and four pararescue teams from the Aerospace Rescue and Recovery Service.

Communication exercises were conducted on 5 March with unalerted merchant ships at sea in order to evaluate their capability for supporting Apollo recovery operations on a "ship of opportunity" basis. Such support might be required in the event of a spacecraft landing in a contingency area outside of the normal recovery area. Participants in this exercise were SS American Rover, SS American Importer, SS Container Dispatch, USNS Mission San Rafael, and SS Exporter.

During the period of 1-9 April, an evaluation of the NASA Mobile Quarantine Facility was conducted in USS RANDOLPH (CVS-15) in port at Norfolk and USS WILLIAM WOOD (DD-715) at sea in the Virginia Capes area. The purpose of this test was to evaluate the compatibility of the MQF with the ships involved and to explore other support problem areas which might be encountered when astronauts are returned from the lunar surface.

On 4 April, Apollo 6 was launched from Cape Kennedy. This was the second spacecraft to be launched by the Saturn V booster. Apollo 6 completed approximately 2 3/4 revolutions of the earth and was recovered in the Pacific recovery area by USS OKINAWA (LPH-3). Atlantic participants in the Apollo 6 mission include USS AUSTIN (LPD-4); USS DUPONT (DD-941); USS YORK COUNTY (LST-1175); USS CHIKASKIA (AO-54); USS OPPORTUNE (ARS-41); a five plane detachment from Helicopter Antisubmarine FIVE and three swim teams from Underwater Demolition Team 21. USS AUSTIN with her helicopters and underwater swimmers was assigned the secondary task of retrieving six camera capsules which were to be ejected after first and second booster stage separation. Two capsules were ejected, both of which were retrieved at sea and returned for NASA engineers to evaluate.

Quarterly Apollo boilerplate recovery training exercises were conducted during the period of 20-24 May in the Virginia Capes Area. Participants included USS WOOD COUNTY (LST-1178); USS CHIKASKIA (AO-54); a four plane detachment from Helicopter Antisubmarine Squadron THREE, three swim teams from Underwater Demolition Team 21, four pararescue teams from ARRS and two planes from the Apollo Range Instrumentation Aircraft (ARIA) Squadron. The capability of ARIA aircraft to locate a downed aircraft was evaluated by electronic means, to provide spacecraft geographical information to the Recovery Control Center, Atlantic, and to relay UHF/HF (AUTOCAT) of the astronaut voice and recovery commentary from on-scene to Norfolk and NASA Houston. The ARIA aircraft effectively carried out these functions.

A preventative maintenance and upkeep/modification program was initiated in May for recovery equipment held in custody of this command. The Apollo Davit Cranes for use on destroyers were disassembled, inspected, repaired and tested prior to reissue. This program was extended to include servicing of cranes which will be provided to the Pacific Fleet.

During the period of 1-3 July, at-sea training was conducted with the USNS VANGUARD to determine the suitability of this range instrumentation ship for Apollo recovery duties.

On 23 July, CINCLANTFLT made an annual administrative inspection of the command and awarded a grade of excellent.

On 31 July, Rear Admiral Thomas A. Christopher was relieved as Commander Manned Spacecraft Recovery Force, Atlantic, by the Chief of Staff, Captain Coleman W. Sims. Admiral Christopher retired from the Navy having completed 35 years of active service.

On 12 August, Rear Admiral Philip S. McManus relieved Captain Sims as Commander Manned Spacecraft Recovery Force, Atlantic. Captain Sims resumed duties as Chief of Staff.

On 19-20 August, the amphibious cargo ship USS ARNEB (LKA-56) became the first ship of her class to participate in recovery operations with at-sea training conducted by the staff off the Virginia coast. She was found to be well qualified for these duties.

On 11-12 September, the antisubmarine warfare carrier USS ESSEX (CVS-9), assigned as the primary recovery ship for Apollo 7, underwent recovery training off Rhode Island with helicopters of HS-5 and swimmers of UDT-21 participating. The training operation was successful and ESSEX was declared ready for her first recovery duty.

On 16-18 September, the USNS VANGUARD again went to sea to perform recovery practice for the Apollo 7 mission. The training was conducted by the staff operations department.

On 26-27 September, the amphibious transport ship USS CAMBRIA (LPA-36), the first ship of her class used in spacecraft recovery, received underway recovery training to qualify her for duty on Apollo 7 mission.

Apollo 7 was launched from Cape Kennedy on 11 October and recovered South of Bermuda on 22 October by the primary recovery ship, USS ESSEX (CVS-9). Two days later ESSEX arrived at Norfolk and off-loaded the command module. At NAS Norfolk in hanger LP-2, the command module was deactivated by NASA and North American Rockwell technicians, then flown to California for a complete engineering study.

Task Force 140 immediately began planning for the December flight of the manned Apollo 8. USS RANKIN (LKA-103) received recovery training off the coast of Virginia on 29 October and USS FRANCIS MARION (LPA-249) training was conducted in the same area on 31 October and 1 November.

USS CHUKAWAN (AO-100) conducted at-sea recovery training off Virginia on 6-7 November. NASA announced on 12 November that Apollo 8 would be launched on 21 December and would orbit the moon ten times before returning to earth.

During the week of 8-11 November, USS SANDOVAL (LPA-194) and USS GUADALCANAL (LPH-7) conducted recovery training off the coast of Virginia. Other units assigned to the Apollo 8 mission included: Helicopter Antisubmarine Squadron THREE, Underwater Demolition Team 21, Weather Reconnaissance Squadron FOUR and the USS SALINAN (ATF-161), the inport standby rescue salvage ship.

Apollo 8 was launched on 21 December and was recovered on 27 December by the USS YORKTOWN (CVS-10) in the Pacific, 1000 miles south of Hawaii.

In January, Task Force 140 began training for the Apollo 9 earth orbital mission. USS GUADALCANAL (LPH-7) was named as the primary recovery ship and received at-sea training in recovery operations. The amphibious transport USS CHILTON (LPA-38) and the amphibious cargo ship USS ALGOL (LKA-54), both on their initial recovery duty, also conducted at-sea training in preparation for the scheduled 28 February launch.

Also during the month of January the Mobile Quarantine Facility (MQF) was tested onboard the GUADALCANAL and the destroyer USS Myles C. FOX (DD-829). Other units assigned to the Apollo 9 mission inlcuded Helicopter Antisubmarine Squadron THREE, Underwater Demolition Team TWENTY TWO, and the USS PAIUTE (ATF-159), the inport standby rescue salvage ship.

Apollo 9 was launched on 3 March and splashed down on 13 March in the Atlantic 400 miles north of Puerto Rico when bad weather necessitated a change in the Primary Recovery Area.

During the month of March, USS YORK COUNTY (LST-1175) was trained in the Virginia Capes operating area to prepare her for Apollo 10 recovery duty. Later, however, she was eliminated from recovery duty. On 15-16 April, USS OZARK (MCS-2) was trained in the Charleston operating area as the first of her class named for Apollo recovery duty. OZARK was assigned as the secondary recovery ship with her station in the South Atlantic. Also during April, USS CHILTON (LPA-38) received underway training in the Virginia Capes operating area. CHILTON was assigned a recovery station off the Canary Islands and was released from recovery duty after Apollo 10 successfully achieved translunar insertion.

During the second week of May, USS RICH (DD-820) was trained for recovery duty off the Virginia Coast. RICH was assigned station 1, 400 miles downrange from Cape Kennedy. RICH was released from recovery duty after successful translunar insertion. USS SALINAN (ATF-161), the inport standby salvage rescue ship, was the final member of the Apollo 10 recovery force in the atlantic.

Apollo 10 was recovered by the USS PRINCESTON (LPH-5) in the Pacific on 26 May.

During the period prior to the scheduled launch date of Apollo 11, the USNS VANGUARD trained in recovery operations off the coast of Port Canaveral, Fla. The USS OZARK trained off the coast of Charleston, S.C. and the third ship to be assigned to the Atlantic Recovery Force, USS NEW (DD-818) trained off the coast of Virginia. The fourth ship for recovery duty is the USS SALINAN, the in-port standby ship.

REAR ADMIRAL PHILIP STANLEY MCMANUS, USN

Rear Admiral Philip Stanley McManus, U.S. Navy, assumed duties as the Navy Deputy to the Department of Defense Manager for Manned Space Flight Support Operations; Chief of Naval Operations Representative for Manned Space Flight Support Operations; and Commander Manned Spacecraft Recovery Force, Atlantic (CTF-140) on August 12, 1968.

He was born in Holyoke, Massachusetts on 18 July 1919, son of William and Carrie McManus. He entered schook in Holyoke, graduating from High School in June 1937. In June 1939 on a Congressional appointment after competitive examination he entered the U.S. Naval Academy, Annapolis, Maryland and was commissioned Ensign in June 1942.

Following graduation from the Academy he served as Assistant Gunnery Officer aboard the destroyer USS BEATTY. The BEATTY performed escort duty in the North Atlantic and participated in the invasions of North Africa and Sicily.

He received precommissioning training and served aboard the destroyer USS ROWE as Assistant and then Gunnery Officer from November 1943 until October 1945. The ROWE participated in the Aleutian Campaign and the siege of Okinawa.

From November 1945 until July 1946, serving as Executive Officer and Navigator of the destroyer USS AULT, he performed occupation, pacification and repatriation duties with the Naval forces operating in the Japanese home waters.

Following a special assignment to Tokyo from July to December 1946 as Aide to Admiral J.O. Richardson, USN (Retired) he reported to the Fleet Training Center, Boston and the Fleet Training Group (underway training unit) Narragansett Bay, Rhode Island as Services Scheduling Officer and Assistant Operations Officer where he served in this capacity until July 1948.

From July 1948 until May 1950 he attended the U.S. Naval Academy postgraduate training in Ordnance Engineering (Guided Missiles) at the U.S. Navy Postgraduate School and School of Engineering, John Hopkins University. Upon graduation he was awarded a Master of Science Degree in Electrical Engineering by John Hopkins University.

Following postgraduate training Admiral McManus served from June 1951 until February 1953 as Navigator on the cruiser USS TOLEDO which participated extensively in bombardment operations against the aggressor forces in Korea.

From March 1953 until December 1954 as Assistant Section Head and Project Officer of the Guided Missile Research and Development (Air-to-Air) Section of the Bureau of Ordnance in Washington, D.C., he provided technical direction in the Navy's Air-to-Air Guided Missile developments.

During the period February 1955 until June 1956 he was the Gunnery and Special Weapons Officer aboard the aircraft carrier USS VALLEY FORGE. He assumed command of the destroyer USS WILLIAM M. WOOD (DD-715) in June 1956 and served in the Atlantic Fleet until November 1957.

The period from December 1957 until July 1960 saw him serving in the office of the Bureau of Naval Weapons Representatives, Lockheed Missile and Space Division, Sunnydale, California. As head of the Missile Division he provided technical field service liaison/direction to the West Coast contractors developing the Fleet Ballistic Missile (Polaris) Weapons System under the Special Projects Office.

From August 1960 through June 1961 he attended and graduated from the Senior Officer Advance Study and Naval Warfare Course at the Naval War College, Newport, Rhode Island.

In July 1961 he became Chief Staff Officer of Commander Amphibious Squadron EIGHT serving with the U.S. Second and Sixth Fleets until July 1962.

From August 1962 until October 1965 he served as Head of the Missile Ordnance Division of the Research Group of the Bureau of Weapons, Washington, D.C.

In October 1965 he reported as Commander Landing Ship Flotilla ONE. One year later he reported as Commander Amphibious Squadron FIVE serving with the First and Seventh Fleets, and Commander Amphibious Task Force ALFA, U.S. Seventh Fleet in the South China Seas and was in this assignment when selected for Rear Admiral.

He is authorized to wear the Legion of Merit with Combat "V"; Navy and Marine Corps Medal; Navy Commendation Medal with Combat "V" and two bronze stars; American Defense Medal; American Campaign Medal; European-African-Middle Eastern Campaign Medal with three bronze campaign stars; Asiatic-Pacific Campaign Medal with one silver and four bronze campaign stars; World War II Victory Medal; Navy Occupation Service Medal; China Service Medal; National Defense Medal; Korean Defense Service Medal; Philippine Liberation Medal; Korean Presidental Unit Citation and the Vietnamese Navy Distinguished Service Medal.

Admiral and Mrs. McManus, the former Miss Mary Frances Martin of Holyoke, Massachusetts, have two daughters, Patricia, 23, Susan, 20, and two sons, William, 21 and Philip, 17.

Captain Theodore W. Pstrak
Commanding Officer
USS OZARK MCS-2

Captain Pstrak was born in Wilkes-Barre, Pennsylvania on 8 February 1927. He graduated from high school in 1944 and entered the Navy as an aviation cadet in June of that year. In 1945 he was ordered to the Naval Reserve Officer's Training Corps at Pennsylvania State University, where he received his Bachelor of Science degree and was commissioned upon graduation in January 1948.

His sea going billets include duty aboard the USS HOBSON (DMS-26) and as Executive Officer of USS GROSBEAK (AMS-14). He was Commanding Officer of USS ALACRITY (MSO-520) and Commander Mine Division EIGHTY-TWO. Ashore, he served on the staff of Commander Mine Force, U.S. Atlantic Fleet, and as Executive Officer of the U.S. Naval Station, Trinidad, The West Indies. He also was Commanding Officer, Military Sea Transportation Service Offices, Taipai, Taiwan, The Republic of China and Officer-in-Charge, MSTS Unit, Da Nang, Vietnam, for which duty he was awarded the Bronze Star Medal and Navy Unit Commendation Ribbon.

Captain Pstrak has attended the Mine Warfare School, Yorktown, Virginia, a special Advanced Mine Countermeasures Course, and a six month course in Freight Transportation and Traffic Management at the Naval Supply Center, Oakland, California. He earned his Masters Degree in Management from the Naval Postgraduate School at Monterey, California.

Captain Pstrak reported as Commanding Officer USS OZARK from duty as the Commanding Officer, USS SOLEY (DD-707).

Captain Pstrak is married to the former Helen Tyriw of Dalton, Pennsylvania. They have five children and reside at U.S. Naval Station, Charleston, South Carolina.

USS OZARK (MCS-2)

Stimulated by lessons learned in Mine Warfare off Korea, the U.S. Navy took a serious look at its forces. Further, the Marine-Navy concept of vertical envelopment led to a Mine Force requirement for a fast ship to accompany and support the highly mobile Amphibious Force. In the past, the command and control problems involving the Minesweepers were unwieldy. Difficulties due to late communication and time required to process data limited the ability to monitor an operation and positions of minesweepers. Logistic support of the relatively small minesweepers was another problem.

USS OZARK (MCS-2) is designed as the answer to most of these problems and to alleviate certain other undesirable conditions. With an embarked Mine Warfare Commander and Staff, she controls, repairs and supports mine countermeasure ships and boats. She transports, operates and supports twenty minesweeping launches (MSL) and two minesweeping helicopters. She provides limited logistic support to the larger minesweepers (MSO and MSC). Additionally, she is capable of lift and support of a Mobile Inshore Undersea Warfare Unit with the removal of certain mine countermeasures capability and an Explosive Ordnance Disposal Unit. As an alternative to the carrying of mine countermeasures forces, OZARK can transport and plant large numbers of sea mines.

On 24 June 1966 she was recommissioned USS OZARK. After a forty five day outfitting period in Norfolk Naval Shipyard at Portsmouth, Virginia, OZARK left the Norfolk area enroute to her homeport of Charleston, South Carolina. On 7 September 1966, OZARK arrived in Charleston.

On 26 September 1966, OZARK set sail for Guantanamo Bay, Cuba, for a six week shakedown training period under the Fleet Training Group. During this period, OZARK set several records; for example, replenishing three Ocean Minesweepers (MSO) at one time.

After receiving a grade of Excellent for underway training and commendatory messages from Commander Naval Base Guantanamo and Commander Fleet Training Group for rendering assistance to Naval Base residents recoverying from the passage of Hurricane INEZ, OZARK returned to Charleston on 7 November.

From 9 January to 4 February 1967, OZARK conducted her first Mine Countermeasure Training in the Charleston local OPAREA. Shortly before this period the RH3A minesweeping Helicopters had been accepted by the Navy. OZARK's helo detachment for the first time operated from the ship in a mine sweeping role. OZARK accomplished her assigned training tasks with a degree of proficiency.

On 7 February OZARK entered Charleston Naval Shipyard for post shakedown availability where she remained until 25 April.

During the period from 26 April until 8 June, OZARK conducted local operations off Charleston, including type training, a staff exercise for students of the Naval Schools Mine Warfare, Navy League and family cruises.

Leaving on the 9th of June and returning on the 22nd of July OZARK deployed on a northern European cruise to demonstrate her new concepts and capabilities to five NATO countries. In each country a two hour minesweeping demonstration was given to the mine warfare staffs. During this cruise the ship was visited by many high ranking U.S. and NATO dignitaries including Margaret Tibbets, the American Ambassador to Norway.

Upon returning to the U.S., OZARK entered Charleston Naval Shipyard for phase II of the post shakedown availability until 20 September.

During that time Captain W.B. Hooffstetter, USN, relieved Captain C.E. Little, USN, on 24 August, in ceremonies held on the flight deck.

During the period 21 September to 20 October, OZARK gave a minesweeping demonstration to participants of the annual COMINELANT/COMINEPAC conference held at the Navy Mine Defense Laboratory, Panama City, Florida. The remainder of the year was spent in local exercises off Charleston and one visit to Beaufort, S.C. for the Navy League "Navy/Marine Corps Day."

The early part of 1968 was spent in local operations off Charleston.

From 22 to 29 February OZARK participated in the annual MARDIS GRAS festival at Mobile, Alabama.

After returning to Charleston the ship departed on 4 March on a minesweeping/amphibious exercise in the Caribbean returning on 29 March.

From that date the ship conducted local operations until 6 June when the ship sailed on the SCORPION search operation service as flagship for the search force commander. She returned to Charleston on 13 July.

The period 14 July until 17 November was spent conducting local operations and preparing for deployment to the Mediterrean. Arriving on 28 November she conducted routine fleet operations with the U.S. SIXTH Fleet, including a NATO naval exercise with naval units from Italy, Greece and Great Britian. She returned to Charleston on 14 February 1969. In April she deployed to the South Atlantic in support of the Apollo 10 lunar mission.

In summary, OZARK is a Fleet first, representing a new concept in Mine Warfare. Her twenty 36-foot mine sweeping launches (MSL, MARK IV) and her two mine sweeping helicopters are also the first craft of their type to join the Fleet. This significant addition to the seapower of the United States of America stands ready to carry out her motto, "LIRERARE AUT CLAUDERE", translated, "TO CLEAR OR CLOSE THE SEAS."

Commander Henry C. Arnold, Jr.
Commanding Officer
USS NEW (DD-818)

Commander Henry C. Arnold, Jr., was born on 30 June 1928 in Athens, Pennsylvania, and is a graduate of the U.S. Naval Academy, Class of 1951.

Upon commissioning in June 1951, Commander Arnold was assigned to the USS BASILONE (DD-824) where he served in the engineering department. In May 1952 he reported to Pensacola, Florida for flight training and was designated a Naval Aviator in July 1953.

Following flight training he served during 1953-56 in the maintenance department of Attack Squadron EIGHTY-THREE flying F9F-5 and F7U-3M jet attack aircraft and during 1959-61 as the Administrative Officer and then as the Maintenance Officer of Attack Squadron SEVENTY-TWO flying A4 jet attack aircract. During his second tour, Attack Squadron SEVENTY-TWO was assigned to the USS INDEPENDENCE (CVA-62) and participated in Cuban operations during April 1961.

Upon redesignation to the general line, Commander Arnold served from June 1961 to November 1963 as Assistant Weapons Officer on the USS SPRINGFIELD (CLG-7) flagship for Commander Sixth Fleet. In September 1966 he was ordered as prospective executive officer of USS HORNE (DLG-30) and became Executive Officer on commissioning 15 April 1967. He served as XO until June 1968 when he was detached to take command of the USS NEW.

Following a course in Airborne Armament Control which included two years at the Naval Postgraduate School and one year at Massachusetts Institute of Technology, Commander Arnold received a degree of Master of Science, Aeronautical Engineering in June 1959. This postgraduate training resulted in his assignment from November 1963 to September 1966 to the Missile Branch of the Fleet Ballistic Missile Program in Washington, D.C. In this tour of duty, Commander Arnold acted within the Missile Branch as Fleet Readiness Officer and subsequently as head of the Missile Engineering Section with responsibilities in the Polaris and Poseidon Missile Development Programs.

Commander Arnold is married to the former Miss Jean Carol Wilkes of Baltimore, Maryland and they have one child, Michael 8.

USS NEW (DD-818)

Built by the Consolidated Steel Corporation, the USS NEW (DD-818) was launched on 18 August 1945 in Orange, Texas. NEW was named in honor of John D. New, Private First Class, U.S. Marine Corps. Private New was killed in action on 25 September 1944, Peleliu Island, Palau Group. For his conspicious gallantry on that occasion he was posthumously awarded the Congressional Medal of Honor. He was also awarded the Presidential Unit Citation Ribbon for service in the First Marine Division Reinforced, on Guadalcanal, Solomn Islands. Since commissioned as DD-818 on 5 April 1946, NEW has served in the Atlantic Fleet with Norfolk, Virginia as her home port.

During the first ten years after commissioning, NEW participated in numerous ASW (Anti-Submarine Warfare) exercises along the East coast of the United States. In July 1957, NEW was awarded her third consecutive battle Efficiency "E".

Following a period of routine operations, overhaul and refresher training, NEW departed the United States in May 1958 for one of many Mediterranean cruises. During this cruise she was called upon to be one of the first ships to patrol the Beirut Straits, awaiting call to evacuate American nationals should it have been necessary. In 1960 she took part in operations in the Caribbean Sea. At the end of the year she was selected to participate in the President's People-to-People Program. During six months of 1961, NEW steamed 37,000 miles of both coasts of Africa, visiting seventeen different ports in five continents, and crossed the Equator four times. She welcomed aboard 18,000 visitors from Spain to South Africa.

October of 1962 brought a new threat to the nation and NEW steamed south to join in the Cuban Quarantine Forces.

NEW entered the Norfolk Naval Shipyard, Portsmith, Virginia in February 1963. Ten months later she left the yards modernized from stem to stern, an accomplishment of the Fleet Rehabilitation and Modernization Program. In 1965, NEW participated in the Gemini 5 recovery operation, and two major ASW exercises.

In June 1967, NEW transited the Panama Canal and visited San Diego, California; Pearl Harbor, Hawaii; Midway Island; Guam; and Subic Bay, Philippines while enroute the Vietnamese combat zone. NEW's first operational assignment in the Seventh Fleet was as an Helo Inflight refueler and "Shotgun" on the Northern Search and Rescue station off the entrance to Haiphong in the Gulf of Tonkin. During her period on station NEW assisted in the recovery of three Naval aviators shot down over North Vietnam.

Upon completion of SAR duty NEW had a brief upkeep period in Kaohsung, Taiwan before reporting to naval gunfire support duty off the I Corps coast of the Republic of Vietnam. She returned to port after her successful combat tour on 16 January 1968.

Since January NEW has participated in several fleet operations including LANTMIDTRARON and the search for the missing nuclear submarine SCORPION in May and June 1968.

LIEUTENANT THEODORE V. TILLINGHAST, JR.
COMMANDING OFFICER
USS SALINAN ATF-161

Theodore Voorhees Tillinghast was born in Dobbs-Ferry, New York on 25 August 1937. The son of Theodore V. and Lillian (Platt) Tillinghast, he attended Lyman Ward School in Camp Hill, Alabama prior to enlisting in the Navy on 28 October 1954.

Following recruit training, Lieutenant Tillinghast joined the Flag Allowance, Commander Cruiser Division THREE where he served five years and attained the rank of Radarman First Class.

While with COMCRUDIV THREE he made numerous deployments to the Western Pacific and participated in operations in the defense and support of the islands of Quemoy and Matsu.

Following duty with COMCRUDIV THREE, Lieutenant Tillinghast was assigned to Fleet Training Center, Newport, R.I. as an instructor in CIC and Electronic Warfare procedures. In May 1962 he was advanced to Radarman Chief while at FTC.

In May 1963 he commenced a four month course of instruction at the Officers Candidate School in Newport which led to his being commissioned an Ensign under the Navy's Integration (Seaman-to-Admiral) program.

As a commissioned officer, Lieutenant Tillinghast served his first two years aboard the Pacific destroyer USS HENDERSON; served six months at Destroyer School; and most recently he was the operations officer aboard the destroyer USS AULT. While aboard the destroyers HENDERSON and AULT, he participated in gunfire support operations off the coast of North and South Vietnam. Lieutenant Tillinghast assumed command of the SALINAN in December 1967.

He is married to the former Ann R. Beatty. The Tillinghast's reside in Neptune Beach, Florida.

USS SALINAN ATF-161

USS SALINAN was built by the Charleston Shipbuilding and Drydock Company of South Carolina and commissioned in August of 1945. The ship is named after the Salinan Indian tribe of California. The primary mission of a fleet tug is heavy towing and salvage with search and rescue as a secondary mission, but SALINAN has been very successful in a large number of research projects, especially deep sea research.

SALINAN is a Service Force ship of the U.S. Atlantic Fleet under the control of Service Squadron EIGHT. She is homeported in Mayport, Florida, having been shifted in 1967 from Key West, Florida, her homeport for 21 years.

SALINAN's duties have taken her throughout the Gulf of Mexico, the Caribbean Islands, various east coast ports and up the Mississippi River. In 1947 SALINAN towed the aircraft carrier KEARSARGE from the Panama Canal to Boston, Massachusetts. SALINAN rescued several ships which had become grounded on the coral reefs in the Florida Keys.

SALINAN has also salvaged various aircraft which have been forced down into the sea, including helicopters, jets and conventional aircraft.

In 1959 SALINAN participated in a deep sea research project to lay a moor in 6,000 feet of water. SALINAN completed this project successfully. During the late 50's and early 60's SALINAN did research in mine warfare, antisubmarine warfare and submarine development.

On several occasions, SALINAN has engaged in joint operations with ships of foreign nations. In 1962 she provided technical assistance. Later that year, she operated with two Canadian vessels, conducting shock tests. The duties of the SALINAN frequently take her to the Caribbean Islands.

In 1965 SALINAN participated in rescue and salvage work after hurricane Betsy destroyed the New Orleans waterfront. In the month that SALINAN worked in the area she salvaged numerous small craft, several heavy vessels and cleared the channels for other rescue and salvage craft. This is hard, demanding work but the training of SALINAN's crew has always proven itself valuable and worthwhile in time and property saved.

Several times in her history SALINAN participated in the United States space effort, generally as a stand-by unit for recovery or as a test support vessel. The ship is well equipped for deep sea recovery operations.

HISTORY
TASK FORCE 130

Task Force 130, the Pacific Recovery Force for the Manned Spacecraft Missions, was activated in 1962 during the Mercury series of manned space flights. The Force's area of responsibility covers the entire Pacific Ocean, from the West Coast of the United States to the middle of the Indian Ocean.

Eleven officers and five enlisted men are permanently assigned to the Task Force. During space flight missions, approximately 1500 men are temporarily assigned from the Navy, Air Force, and Army. Navy units come from the First and Seventh Fleets, while Air Force aircraft and personnel are assigned from the Pacific Aerospace Rescue and Recovery Center. Army personnel come from Army units in Hawaii.

The Task Force saw its first support action on October 3, 1962, when the aircraft carrier USS KEARSARGE recovered Mercury 8 Astronaut, Walter M. Schirra and spacecraft Sigma 7. The Force deployed again on June 16, 1963, this time to recover Faith 7, the Mercury 9 spacecraft piloted by Astronaut L. Gordon Cooper. Again, the KEARSARGE was the pick-up ship. Both missions were planned Pacific landings, and both were recovered in their planned landing areas Northeast of Midway Island.

During the Gemini series of space missions, Task Force 130 played the part of a contingency recovery force. However, during the Gemini 8 mission her training and experience gained from previous missions was realized.

Gemini 8 Astronauts Neil Armstrong and David Scott brought their craft down for a secondary landing in the Western Pacific recovery zone about 600 miles South of Yokosuka, Japan.

Task Force 130 units involved included two Navy destroyers and four Air Force C-130B rescue planes from the Pacific ARRS. The destroyer USS GEORGE K. MACKENZIE was in Okinawa taking on fuel and the USS LEONARD F. MASON was in the northern sector of the recovery zone where the MASON had patrolled in support of an earlier orbit.

Rescue 1, one of the four Air Force aircraft ordered aloft, spotted the capsule before it landed. After splashdown, the plane's three pararescue men parachuted into the sea and attached a flotation collar to the capsule. The MASON arrived on the scene in less that four hours, coming close enough to the capsule so that the astronauts were able to step with dry feet from their vehicle to a jacob's ladder placed on the ships side and then climb aboard. The Force received the National Aeronautics and Space Administration Group Achievement Award for its outstanding work in the recovery of Gemini 8.

The remainder of the Gemini missions were completed without incident. In February 1966, Apollo 201 was launched. It was a down-range shot that was recovered in the area of the Bahamas. Then, in 1966, Apollo 202 was launched from Cape Kennedy and recovered in the Pacific near Wake Island.

The nation's most powerful rocket launch vehicle, the Saturn V, was tested in space for the first time during the Apollo 4 mission flown on November 9, 1967. Test results proved the ability of the heat shild to withstand high temperatures created by the same type of high-speed atmospheric re-entry which astronauts will experience upon return from the moon. The carrier BENNINGTON, assisted by the destroyer CARPENTER and six Hawaii-based Air Force C-130 rescue aircraft made an efficient and rapid recovery of the capsule despite heavy ocean swells and rain squalls in the splashdown area.

Apollo 6 objectives were similar to those of Apollo 4. The landing platform helicopter ship OKINAWA replaced the BENNINGTON. Other elements of the recovery force remained the same as the Apollo 4 mission. Again the Task Force Team functioned smoothly in the efficient recovery of the capsule.

For Apollo 7, TF-130 manned two planned contingency emergency landing areas in the Pacific as backup in case an inflight malfunction of the spacecraft necessitated a landing in other than the Atlantic Ocean Primary area.

Apollo 8 was recovered on 27 December 1,000 miles south of Hawaii after completing 10 orbits of the moon. YORKTOWN (CVS-10) with Underwater Demolition Team TWELVE and Helicopter Antisubmarine Squadron FOUR aboard made the recovery.

For the Apollo 9 mission, COCHRANE and NICHOLAS served as contingency recovery ships. The destroyer MASON joined the recovery force, making this the smallest number of recovery ships on duty in the Pacific to date for a space mission.

Apollo 10 was recovered by PRINCETON with Underwater Demolition Team ELEVEN and Helicopter Squadron FOUR aboard.

The USS HORNET (CVS-12) and USS GOLDSBOROUGH (DDG-20) has been selected as the primary and secondary recovery ship for the lunar landing flight of Apollo 11.

Captain Carl J. Seiberlich
Commanding Officer
USS Hornet (CVS-12)

Captain Carl Joseph Seiberlich was born in Jenkintown, Penn., on 4 July 1921. He attended the University of Pennsylvania and the U.S. Merchant Marine Academy, King's Point, New York graduating with the class of 1943.

Captain Seiberlich served in the S.S. Joseph Lykes and S.S. Mormachawk in the Pacific prior to active duty in the Navy. During World War II he served as Navigator in USS MAYO (DD-422) in both the Atlantic and Pacific theaters. He completed Lighter-than-Air flight training at Lakehurst, N.J., in January 1947 and was then assigned duty with Airship Squadron ONE, NAS Santa Ana, Calif., which was later transferred to NAF Weeksville, N.C. During this period he operated airships from the escort carriers USS SICILY and USS MINDORO. In June 1949 he was assigned as Commanding Officer, Airship ZPM-1 at NAS Lakehurst, N.J.

After completing Heavier-than-Air flight raining in the Naval Air Training Command, Captain Seiberlich joined Patrol Squadron FIVE where he served until March 1955. His next assignment was on the staff of COMFAIRSHIP WING ONE where he served as Readiness Officer. From July 1956 until January 1959 he was assigned as an Aviation Officer Detailer in the Officer of Deputy Chief of Naval Operations and the Bureau of Naval Personnel. In June 1959 after graduating from the Armed Forces Staff College in Norfolk, Va., he was assigned to Air Antisubmarine Squadron 36 embarked in USS VALLEY FORGE where he served as Operations Officer and as Executive Officer. Captain Seiberlich assumed command of Air Antisubmarine Squadron 36 operating from USS RANDOLPH in June 1960. During these periods both squadrons were assigned to TASK GROUP ALFA.

From June 1961 until September 1963 he was assigned as U.S. Plans Officer on the staff of Commander Antisubmarine Warfare Force, U.S. Atlantic Fleet. After a tour in USS INTREPID as Navigator he was assigned to the staff of the Chief of Naval Air Reserve Training, Glenview, Ill., in January 1965 where he served as training Officer and Assistant Chief of Staff. Captain Seiberlich was Commanding Officer of USS SALAMONIE from December 1967 until December 1968. On 23 May 1969 he assumed command of USS HORNET (CVS-12).

Captain Seiberlich is married to the former Trudy Germi of Chicago, Ill. They have three children; Eric 16, Heidi 14, and Curt 9.

USS HORNET (CVS-12)

The eighth HORNET (CV-12) was launched on 30 August 1943 at the Newport News Shipbuilding and Dry Dock Company and commissioned on 29 November 1943. After a brief two-week shakedown off Bermuda, HORNET departed Norfolk for action with the Pacific Fleet. She hastened to Majuro Atoll, Marshall Islands, arriving on 20 March 1944 to join Vice Admiral Marc Mitscher's Fast Carrier Task Force which sortied two days later for the Palau Islands. On 32 March HORNET's planes participated in aerial mining operations to block the main harbor at Palau and the following day conducted air strikes against enemy installations on the Caroline Islands.

Between 21-24 April her planes pounded Japanese airfields and defenses at Wadke-Sarni and Sawar, causing heavy enemy losses. Turning north and east, again for Majuro, HORNET joined in massive air strikes against four Japanese fields on Truk. Cheered by news of a successful Normandy invasion, HORNET joined Task Force 58 and headed for the Marianas, where Mitscher's fast carriers were ordered to attack and destroy as many planes and as much shipping as possible, thus protecting the 15 June scheduled invasion of Saipan. On 11 June HORNET's planes took part in a huge raid on Tinian and Saipan. The following day her battle hungry pilots conducted heavy bombing attacks on Guam and Rota. Steaming north to the Volcano and Bonin Islands, HORNET launched effective strikes against enemy fields at Iwo and Chichi Jima. On 19 June HORNET participated in a decisive naval-air battle, which became known as "The Great Marianas Turkey Shoot."

HORNET's planes attacked and extensively damaged the carrier Zuikaku as the twilight of 20 June faded. While enroute to Eniwetok on 24 June, she launched her planes with 500 pound bombs which they obligingly presented to the Japanese on Iwo Jima. On 7-8 September she launched strikes against Palaus, after which she steamed to the Philippines for five days of intensive raids against key airfields. HORNET then supported General MacArthur's invasion of Morotai. She returned to the Philippines and renewed her raids on enemy installations. By the end of the month her pilots had reaped a harvest of destruction on enemy ships, which totaled 27 confirmed and 128 probable sinkings for a total estimated tonnage of 402,050 tons.

For the next three months HORNET ranged throughout the Philippine Sea as she continued to unleash the armed might of her air power against the Japanese. Though under continuous attack, HORNET launched strikes against Okinawa, Formosa and Northern Luzon and supported the invasion of the Philippines.

During the remained of the year HORNET provided air support, attacked enemy shipping and airfields and turned back Japanese convoys attempting to reenforce their Philippine garrisons. After spending Christmas at Ulithi, HORNET departed on 30 December on a war cruise that provided over three weeks of almost continuous operations, taking her for the first time into the South China Sea for strikes against Formosa, Indochina and the Pescadores.

On 16 February 1945 her planes joined in the first full-scale aerial attack on Tokyo since the Halsey-Doolittle raid 34 months previously by another gallant HORNET. Four days later, HORNET supported the landing on Iwo Jima, then returned to the waters off Honshu for another devastating raid against Tokyo.

On Easter Sunday, 1 April 1945, HORNET provided air support for the invasion of Okinawa. On 6 April the Japanese massed a last-ditched effort, built around the super-battleship Yamato, to stem the tide of the imposing United States Navy. On the 7th, HORNET and other carriers of the Fast Carrier Task Force, launched some 280 planes against the enemy force. In the ensuing battle, HORNET's planes were among the first to bomb and torpedo Yamato.

During the remainder of the month she cruised from the Ryukyus to the home islands, launching air strikes and repelling now desperate attacks by Japanese fighters and suicide planes. On 16 April, alone, her pilots and gunners splashed 54 enemy planes. Returning to the Ryukyus during the second week of May, HORNET's planes attacked and destroyed a huge, newly-built aircraft plant at Kumamoto, Kyushu. HORNET spent the remainder of the month providing combat air support for the ground operations on Okinawa.

After receiving heavy damage to her flight deck in a typhoon, HORNET returned to San Francisco for repair and overhaul in July. Her extensive overhaul completed by the end of August, she remained at Hunter's Point until mid-September, when she joined the "magic carpet" fleet to return veterans home from the Pacific. She was decommissioned on 15 January 1947 and joined the Reserve Fleet.

HORNET was recommissioned on 20 March 1951, sailing from San Francisco to Brooklyn Navy Yard and was decommissioned there on 12 May to undergo conversion. After 27 months, HORNET was recommissioned CVA-12 (Attack Aircraft Carrier) on 11 September 1953. After shakedown in the Caribbean, HORNET joined the Atlantic Fleet and on 11 May 1954 departed Norfolk for an eight-month global cruise. She joined the Seventh Fleet in the South China Sea late in June and arrived in California in mid-December.

After completing training operations off San Diego, HORNET again deployed to the Western Pacific to serve with Task Force 77. She then participated in the evacuation of citizens of North Vietnam to the south. She arrived at the Puget Sound Naval Shipyard, Bremerton, Wash., in January 1956 to undergo extensive reconversion, which included an enclosed bow and a canted flight deck to permit the simultaneous launching and recovering of aircraft. Following overhaul she returned to San Diego, her new homeport, and departed on 21 January 1957 for a six-month cruise with the Seventh Fleet.

After returning to San Diego in late July, HORNET began another intensive training program, which lasted until January 1958. On 6 January she again sailed for the Seventh Fleet. HORNET completed this cruise and arrived in San Diego on 2 July. On 13 August HORNET entered the yards, again at Bremerton, to undergo four months of overhaul and conversion to CVS. Upon completion she became a reliable and efficient base for aircraft whose purpose is to detect and destroy enemy submarines.

After conducting training, HORNET sailed from Long Beach to take part in maneuvers in the Far East. HORNET and her air group performed almost continuous antisubmarine exercises during the cruise, which HORNET completed in October. She departed on 17 May for her sixth deployment in seven years to the Far East, where she supported the Seventh Fleet's peace-keeping missions in Southeast Asia.

Returning home in mid-December, HORNET remained on the West Coast for some 18 months, during which time she received a major overhaul, and conducted readiness exercises. Off-shore exercises continued until June 1962, when HORNET returned to the Far East to bolster the capabilities of the Seventh Fleet. After returning to Long Beach on 21 December, HORNET resumed coastal operations.

Departing Long Beach on 9 October 1963, the ship sailed for the Western Pacific. While in the Far East she participated in amphibious assault exercises on Taiwan by carrying assault helicopters and providing antisubmarine support. She returned to Long Beach on 15 April 1964. Following an extensive seven-month conversion the ship sailed for training in the San Diego area. The ship continued local operations and sailed for duty with the Seventh Fleet on 11 August. Between two periods of duty on Yankee Station in the Tonkin Gulf the ship conducted joint exercises in the sea of Japan with units from the Republic of Korea.

After completing duty in the Tonkin Gulf, HORNET returned to Long Beach on 23 March 1965. On 25 August she was on recovery station near Wake Island for the unmanned Apollo AS-202 mission.

HORNET returned to Long Beach on 8 September, but headed back to the Far East on 27 March 1967. She reached Japan exactly one month later and conducted combined exercises with Japanese and Korean forces. She departed Sasebo on 19 May for the war zone. She operated in Vietnamese waters throughout the remainder of spring and during much of the summer of 1967. On 16 October, she sailed from Yokosuka to Long Beach and entered Long Beach Naval Shipyard on 15 November for a six-month overhaul. HORNET departed Long Beach on 30 September 1968 for another tour of duty in Southeast Asia.

Commander Paul A. Lautermilch
Commanding Officer
USS GOLDSBOROUGH (DDG-20)

Commander Paul A. Lautermilch was born on 11 November 1927 at Cleveland, Ohio. He is the son of the late Mr. Paul Lautermilch of Tiffin, Ohio and Mrs. Clara Grzesk Lautermilch of Toledo, Ohio. He attended Northeast Catholic High School in Phildelphia, Penn., and on graduation attended Villanova College for one year before enlisting in the Navy in 1946. He received a Fleet Appointment to the Naval Academy and entered the Naval Academy in the summer of 1947 and upon graduation in June 1951 received his commission in the U.S. Navy.

His first assignment was to USS TAUSSIG (DD-746) in which ship he served until 1954. He made three deployments to Korean and Far Eastern waters during the Korean War. Subsequent sea tours included duty on a Destroyer Flotilla commander's staff, in cruisers, minesweepers, and most recently as Executive Officer of USS MACDONOUGH, a guided missile frigate. Shore assignments included duty under instruction at Naval Postgraduate School, Monterey, Calif., and at the Naval War College, Newport, R.I., and two tours on the staff of the Chief of Naval Operations in Washington, D.C. His most recent assignment, prior to reporting to GOLDSBOROUGH, was as European and NATO Current Plans Officer on the Navy staff. He assumed command of USS GOLDSBOROUGH (DDG-20) 29 July 1968 at the Pearl Harbor Naval Station.

Besides a BS degree from the Naval Academy, Commander Lautermilch has been awarded a BS (Communication Engineering, Navy Postgraduate School), and a MA (International Affairs - George Washington University).

Commander Lautermilch is married to the former Dorothy Mescher of Toledo, Ohio. They have five children, Dorrie, Paul, Kathy, John and Susan. They presently reside in the Pearl Harbor area.

USS GOLDSBOROUGH (DDG-20)

USS GOLDSBOROUGH (DDG-20) was commissioned on 9 November 1963 at the Puget Sound Naval Shipyard in Bremerton, Washington. This is the third ship of the United States Navy bearing the name of Rear Admiral Louis M. Goldsborough.

Following outfitting in December 1963, GOLDSBOROUGH joined the U.S. Pacific Fleet as a unit of Cruiser-Destroyer Force and Destroyer Flotilla FIVE, homeported in Pearl Harbor, Hawaii. After arrival in Pearl Harbor in February 1964, GOLDSBOROUGH departed for Australia and participated in the 1964 Coral Sea celebration.

In July 1964, the ship became the Flagship for Commander, Destroyer Squadron 11. GOLDSBOROUGH completed its first Western Pacific deployment in May 1965 and returned to the Far East in early 1966 as a unit of Anti-submarine Warfare Group THREE. From February to August 1966, She remained in the Western Pacific operating with other Seventh Fleet units.

From September 1966 until March 1967, GOLDSBOROUGH underwent her first yard overhaul at Naval Shipyard, Pearl Harbor.

GOLDSBOROUGH deployed to the Seventh Fleet in August 1967. From September 1967 through February 1968, she provided Naval Gunfire support along the DMZ in Vietnam and participated in the Navy's operation designed to interdict the North Vietnamese lines of supply into the Republic of Vietnam. These operations were called 'Operation Sea Dragon". During this deployment, GOLDSBOROUGH fired nearly 10,000 rounds in support of allied forces and avoided over 800 rounds of hostile fire without damage to the ship.

Upon return to her homeport in February, she was awarded the Naval Commendation for exceptionally meritorious service in Vietnamese waters. On July 1, 1968 she was assigned to Destroyer Division 112 and became the Flagship for the Commander.

On 22 November 1968 GOLDSBOROUGH departed Pearl Harbor, commencing her fourth deployment to the Western Pacific in five years. GOLDSBOROUGH participated in eighty eight gunfire missions in support of Republic of Vietnam, Republic of Korea, and U.S. Marine and Army forces. The ship was credited with the destruction of more than 150 Viet Cong gun and military support structures and 50 enemy supply and training complexes in CTZ I, Republic of Vietnam.

Commander Donald S. Jones
Commanding Officer
Helicopter Antisubmarine Squadron FOUR

Commander Jones was born in Madison, Wisconsin and attended high school and the University of Wisconsin there. He enlisted in the Navy in 1950 and a year later commenced flight training as a Naval Aviation Cadet. Upon graduation in February 1953 he was commissioned as Ensign, USNR, and ordered to Ellyson Field for helicopter training.

In 1955, while assigned as ASW Helicopter Project Officer with Air Development Squadron ONE (VX-1), he accepted a regular commission as Lieutenant (junior grade), USN. Subsequent squadron assignments have included Helicopter Antisubmarine Squadron ONE, and two tours with HS-5.

In 1959, Commander Jones completed postgraduate instruction at the Naval Intelligence School. He was later ordered to the Taiwan Defense Command, in Taipei. Prior to reporting to HS-4 as Executive Officer he was assigned to the Strategic Plans Division in the Office of the Chief of Naval Operations. On 27 November 1958, CDR Jones took command of HS-4. In December CDR Jones, flying "Recovery THREE" recovered the Apollo 8 astronauts after their historic journey around the moon.

Commander Jones is married to the former Marilyn Turner, also of Madison, and they reside with their four children in Chula Vista, Calif.

HELICOPTER ANTISUBMARINE SQUADRON FOUR

HS-4 was commissioned in June 1952 at Auxiliary Landing Field Ream, San Ysidro, California. Since commissioning the squadron has flown many different types of helicopters, including the HO-3S, HUP-2, HSS-1N, HO-4S and the SH-3A. The squadron is now equipped with 17 SH-3D turbine powered helicopters.

HS-4 was the first ASW helo squadron to deploy aboard an aircraft carrier, the USS RENDOVA (CVE-114). In 1961 the squadron became the first command in Naval Air Force, U.S. Pacific Fleet to achieve 24-hour helo ASW capability with the HSS-1N. It was this capability that earned HS-4 the title of "Black Knights" and the authorization to wear the now famous beret.

The initiation of HS-4 into the "Tonkin Gulf Yacht Club" came during the 1966 WESTPAC cruise. While operating in the Gulf of Tonkin, HS-4 pilots and aircrewmen rescued 24 downed airmen - the largest number recorded by any ASW squadron.

HS-4 deployed for the 1968 WESTPAC cruise aboard the USS YORKTOWN (CVS-10) as a component of CVSG-55. The squadron participated in exercises off Hawaii, was with the task force sent to the Sea of Japan at the beginning of the Pueblo Crisis, and carried out operations in the Gulf of Tonkin in support of the United States efforts in Southeast Asia. During this deployment the squadron Pollywogs joined the ranks of the Salty Shellbacks as YORKTOWN crossed the Equator just prior to a port call in Singapore. The blend of hard work at sea and relaxation during liberty call made the 1968 cruise a memorable experience.

The CNO Safety Award for 1968 was presented to HS-4 in recognition of the outstanding safety record achieved during operations with the Pacific Fleet. It marks the second consecutive year HS-4 had received the award. The squadron has also been honored for the second time with the Battle Efficiency "E" Pennant. The distinction was again accompanied by the presentation of the Isbell Trophy for ASW excellence.

HS-4 made one last deployment aboard YORKTOWN as the Helicopter Recovery Unit for the Apollo 8 Lunar probe. Since the YORktown has been transferred to Norfolk, deployments are presently made aboard USS BENNINGTON (CVS-20) serving with VS-33, VS-38 and VAW-111 Det 20 as a part of Carrier Antisubmarine Air Group 59. During the Apollo 10 Lunar probe, HS-4 helicopters operating from the USS PRINCETON (LPH-5) safely recovered the astronauts and their command module.

SH-3D SEA KING

The SH-3D "Sea King" helicopter is manufactured by the Sikorsky Aircraft Division of United Aircraft Corporation, located in Stratford, Conn. It is one of the Navy's newest additions to the ASW (Antisubmarine Warfare) arsenal, and was first delivered to fleet units in the summer of 1966.

Basically designed as an ASW vehicle, the SH-3D is provided with all of the necessary equipment and instrumentation for all-weather ship and shore based operations to detect, track, identify and, if necessary, destroy enemy submarines. In addition to its ASW functions, the "Sea King" is well equipped for and very proficient in executing rescue at sea.

The "Sea King" weights 11,800 pounds with a maximum "fully-loaded" weight limitation of 20,500 pounds. it is 16' 10" in height, 16' 4" in width and 72' 8" long (including rotor blade spread). It is powered by two General Electric T58-10 turboshaft engines, each capable of developing 1400 shaft horsepower and supporting the aircraft at speeds from 0 (hover) to 160 mph. The SH-3D carries a fuel load in excess of 5,500 pounds enabling it to remain airborne for six hours. The electrically operated winch is capable of lifting 600 pounds and carries 100 feet of cable.

Two pilots and two crewmen are required for tactical flight. The pilots are responsible for the flight and navigation of the aircraft while the crewmen operate the sonar and the rescue equipment. The helicopter uses all of the standard radio and navigational equipment and also has a Dead Reckoning Tracer which receives its guidance information from a doppler radar.

One of the most extraordinary features of the "Sea King" is its boat-shaped hull which enables it to land, taxi and take off from the water.

The SH-3D represents the Navy's newest and most sophisticated ASW helicopter and encompasses all of the necessary equipment to fulfill its mission in any environment and in any weather.

HC-130 HERCULES

The Air Force Aerospace Rescue and Recovery Service (ARRS) has been involved in America's space program since the Discoverer series in the early sixties. The Apollo 11 launch will mark the seventh time ARRS has not had more than one type of fixed wing aircraft supporting contingency recovery operations.

The aircraft selected by ARRS for contingency recovery operations is the Lockheed HC-130. Incorporating the latest mechanical and electronic equipment, it is the first aircraft to be specifically designed for rescue and recovery requirements.

The HC-130, nicknamed "Hercules", has a range of 4,500 nautical miles. Therefore, it would be possible for the Hercules to fly 2,000 miles, orbit over a position for more than three hours while recovery operations are underway, then return to its home station.

Employing the unique surface-to-air recovery system, the HC-130 could recover personnel and/or space hardware weighing up to 500 pounds in emergency conditions.

During all Apollo launches, the HC-130 will carry a crew of 11, including a pilot, co-pilot, navigator, radio operator, two flight mechanics, two loadmasters, and three pararescuemen.

Qualified for day or night all-weather operations, the Hercules is equipped with new complex spacecraft tracking, navigational and communications systems in addition to automatic flare launchers, and an overhead delivery system for deploying equipment, modified equipment bins for specialized rescue and recovery gear and special compartments for crew rest on extended missions.

New Allison T56-A-15 engines, plus two 1,800 gallon fuel tanks enable the Hercules to stay aloft for more than 18 hours. Whereas in the past, ARRS was called upon to provide 400 personnel and 25 or more fixed wing aircraft for contingency operations, these numbers have been cut in half due to the presence of the "Hercules".

E-1B "TRACER"

The E-1B is a twin-engine, high wing, carrier-based plane built by the Grumman Aircraft Engineering Corporation. Its primary missions are to provide airborne early warning and to control intercepts in the event of an enemy air attack and submarine detection. It can operate from land bases or take off from a carrier deck with or without the aid of a catapult, and land with the aid of its arresting gear. It is equipped for all-weather flight and is operated by a crew of four, consisting of a pilot, co-pilot and two search and control operators. Some aircraft are configured with a fifth seat located at the entrance door. During search operations and training, the co-pilot or an additional crewman may serve as tactical director.

POWER PLANT

2 Curtis Wright 1820-82A, 1525 HP each

AIRCRAFT DIMENSIONS

Wing Span 72'4"
Length 45"2½"
Height 16'10"
Take-off weight 27,400 lbs.

Cruise Speed: 140 MPH
Endurance: 6½ HRS, Plus reserve

MISSION

E-1Bs deploying with attack carriers perform an early warning and intercept control mission. They act as a long range radar shield for the fleet by detecting and reporting unidentified aircraft. On carriers with a designated antisubmarine mission the TRACER works in an antisubmarine warfare environment. The E-1B performs an airborne command and control function for the Hunter-Killer Group Commander.

PARARESCUE OPERATIONS

Pararescuemen of the Aerospace Rescue and Recovery Service (ARRS) are among the most highly trained, dedicated professionals in the armed forces.

They are precision parachutists, skilled medical technicians and experts in survival. They are highly trained in SCUBA diving, mountain climbing and tree jumping. In short, they are well equipped with the techniques they need to do their job - save lives.

Pararescuemen (called PJs, for short) are all volunteers dedicated to serve the ARRS motto - That Others May Live.

The history of pararescue began in August 1943 when 21 people bailed out of a disabled C-46 over an uncharted jungle near the China-Burma border. So remote was the site that the only way to get there was by pararchute. Lieutenant Colonel Don Flickinger, a wing surgeon, and two medical corpsmen volunteered for and made the jump. For a month these three, aided by natives, cared for the injured until the party was brought to safety.

Commentator Eric Sevareid was one of the survivors. He later wrote of the men who had risked their lives to save his: "Gallant is a precious word; they deserve it."

The most recent development in the list of pararescue skills is the combination of SCUBA with parachuting. For jumping into the sea a PJ carries more than 170 pounds of equipment. Over a rubber wet suit the PJ carries a set of modified SCUBA tanks and regulator, two parachutes, a rubber dinghy, a medical kit, a weight belt, a diving knife, rubber swim fins and boots, a rubber hood, a face mask, a diver's watch, a compass and a depth gauge.

For Apollo missions he carries an accessory kit containing a radio, snorkel, flashlight and Apollo interphone (a self-energized telephone used for contacting the astronauts before the hatch is opened.)

Pararescuemen assigned to spacecraft recovery duties undergo many hours of specialized, exacting training. Under NASA guidance they learn to attach flotation devices to a variety of space hardware, practicing until they work as a smooth, efficient, three-man team.

For Apollo 11, PJs will be deployed around the world in selected locations in Florida, the Azores, Mauritius Island in the Indian Ocean and Hawaii. They will be aboard HC-130 aircraft and HH-3E and HH-53C helicopers - the ARRS aircraft which are making history in daring jungle rescues in Southeast Asia.

One HH-3E and two HH-53C helicopters stand by near the Cape Kennedy launch site; three pararescuemen aboard each helicopter are ready in case the mission is aborted from the pad or within the first seconds after launch

If there is an abort from the pad, the Apollo-Saturn's launch escape tower would fire, lifting the command module away from the rest of the launch vehicle. The helicopters would follow the astronauts to splashdown in the Atlantic and, within minutes, come to a hover 10 feet above the floating spacecraft.

Three pararescuemen and the flotation collar drop through the helicopter's door into the sea. The PJs attach the collar and check the astronauts' condition. The HH-53C helicopter has the capability of lifting the command module, with the astronauts inside, and flying to the beach.

The recovery is much the same if the mission is aborted just seconds after launch when the spacecraft is farther downrange.

When the launch vehicle functions correctly, inserting the command/service modules into earth orbit, the helicopters are released and the Rescue HC-130 aircraft take over the contingency recovery responsibility.

A contingency landing could be made for a number of reasons involving dangerous malfunctions in the spacecraft systems after orbital insertion, resulting in the spacecraft landing outside planned recovery zones.

If this were to occur, the HC-130 aircraft nearest the landing area has the initial responsibility to track and locate the spacecraft.

With the spacecraft in sight the HC-130 deploys the PJs and the Air Delivered Drift Reduction System (ADDRS).

This new system consists of two packages connected by 600 feet of buoyant line. One package is a flotation collar, the other is a collar bag containing parts of an MA-1 survival kit. The packages are delivered from an altitude of 300 feet using the HC-130's overhead delivery system. They land downwind of the drifting module.

The packages on either end of the line act as anchors, allowing the drifting spacecraft to catch up with and snag the line. The astronauts lower a small, collapsible grappling hook to snag the line should the spacecraft ride over it.

Once the spacecraft catches the ADDRS, the HC-130 flies over again, this time at 1,000 feet, and one PJ jumps into the sea. After swimming to the ADDRS, he attaches his reserve parachute to the command module to slow the drift rate further.

Then the HC-130 flies by once again, dropping the two other pararescuemen, and continues to orbit the area to maintain communications with the PJs and with surface vessels enroute to the scene.

The pararescuemen attach the flotation collar, inflate the six-man raft which is part of the ADDRS and help make the astronauts comfortable until a surface craft arrives.

UNDERWATER DEMOLITION TEAM ELEVEN

The Underwater Demolition Teams of the U.S. Navy, popularly known as the Navy's "Frogmen", have brilliantly performed their mission of beach reconnaissance and obstacle clearance as well as many associated tasks requiring highly trained and physically fit combat units since their conception during World War II.

Originally organized as small six man Naval Combat Demolition Units, they were re-organized and expanded to 100 man Underwater Demolition Teams, with the added mission of reconnaissance, after the disastrous landings at Tarawa, where entire waves of landing craft carring U.S. Marines went aground on a submerged coral reef which had not been revealed by aerial reconnaissance photos. The Marines were forced to wade the mile and a half to the beach in hip deep water under withering Japanese fire. The losses were staggering.

A recurrence of this tragedy was prevented by the rapid formation of 34 highly trained UDT teams, eventually numbering 3500 men and officers, who cleared every subsequent amphibious beach assault in the Pacific and proceeded the landings at Normandy.

The Germans had prepared huge obstacle fields and fortications on the Normandy beaches. The D-Day landings were successful due to the work of UDT units who cleared a path through the obstacle fields despite 70% casualties. Prior to each landing in the Pacific, the teams would conduct a reconnaissance on the morning or evening of D-Day minus 4, operating from small, fast boats, followed by a demolition clearance at dawn of D-Day, just prior to the run of the first wave of boats.

After the war, demobilization reduced the number of UDT Teams to two teams in the Atlantic and Teams ONE and THREE, organized as Underwater Demolition Unit ONE, on the West Coast. UDT ONE, the immediate ancestor of UDT ELEVEN, was commissioned on 21 May 1946.

By 1948, UDT teams had dwindled to a skeleton complement of only 7 officers and 45 enlisted men each. 1947 marked the first peace time Artic trip for UDT with their participation in the Point Barrow Re-Supply Expedition, the first of many cold weather operation exercises.

The outbreak of the Korean War brought the Teams back into their familiar role of beach reconnaissance and further expanded their mission to include inland demolition raids, buoy laying, bomb and mine disposal operations, and guerilla drops behind enemy lines and channel clearance.

With a base at Camp McGill in Japan, Team ONE combined forces with a detachment of Marines to form a raider group whose mission was to destroy tunnels and bridges of coastal railroads and highways, a task at which they were highly successful. Next for UDT ONE came the familiar job of reconning beaches, including the mud flats at Inchon, where the masterful amphibious

landing occurred with UDT ONE men serving as assault wave guides. During the mopup of the operation, UDT ONE was called upon to set buoys, conduct bomb and mine disposal operations, assist in salvage work, and demolish hazardous wrecks.

As the United Nations forces conducted amphibious landings at the ports of Wonson and Chinnampo in Korea, UDT was assigned the new mission of searching and clearing these harbors of mines which had been heavily sewn by the Communists. Conditions of extreme cold and a shortage of adequate equipment made this an arduous task, but by November 1950, 200 miles of channels were cleared and the landings were successful, due to these "Human Minesweepers."

In all, UDT ONE saw three tours of duty in Korea during the conflict alternating between administrative reconnaissance behind friendly lines and guerilla drops behind enemy lines. While serving as part of Naval Beach Group ONE in Korea, the Team earned the Presidential Unit Citation and the Naval Unit Commendation.

After the signing of the Korean Armistice in 1953, peacetime operations were resumed and UDT ONE was redesignated as UDT ELEVEN on 8 February 1954. Team ELEVEN returned to the Alaskan scene in 1954 for training exercises and also charted safe passage for the amphibious transport group during the evacuation of the Tachen Islands by the Nationalist Chinese in 1955.

During these peacetime years, the Underwater Demolition Teams continued to maintain a high state of readiness by participating in Pacific Fleet Amphibious Force Exercises, and regularly working with Allied Underwater Demolition Teams. With the development of SCUBA (self contained underwater breathing apparatus) and other underwater equipment, UDT assumed still another mission of underwater sneak attacks against ships, docks, etc. Team ELEVEN also began Airborne Training in 1960 and by 1964, 90% of the Team was Airborne qualified, making UDT men some of the few personnel in the U.S. Military Forces eligible for double hazardous duty pay (parachute and demolition).

Stateside peacetime operations have included the exacting and quite necessary job of spacecraft recovery, diving research (Sealab), search and recovery of drowning victims, lost aircraft and anchors, and public relations demonstrations.

In 1963, UDT ELEVEN came under a new administrative staff with the disestablishment of Underwater Demolition Unit ONE and the Commissioning of Naval Operations Support Group, Pacific, with headquarters at the U.S. Naval Amphibious Base, Coronado, California. President John F. Kennedy's emphasis on Guerilla warfare prompted the formation of Seal Team ONE in January of 1962 and quite naturally it was UDT who was called on to supply rugged, well trained and self reliant individuals capable of tackling any job. This brought a new emphasis on the inland reconnaissance and demolition raid capabilities of UDT which had emerged during the Korean War. The fine record of the Seals in Vietnam is yet another example of UDT's flexibility and willingness to take on any job or mission.

Since the Tonkin Gulf incident in August 1964, UDT operations have stepped up considerable and once again entire UDT Teams are being deployed to the Western Pacific to meet the many operational commitments of our U.S. Naval Amphibious Force. Since hostilities began in Vietnam, UDT ELEVEN and TWELVE

have reconned over 200 miles of Vietnam coastline.

In addition, Team ELEVEN was called upon to set up a special surveillance/ ambush group in the Rung Sat Special Zone in support of Operations Jackstay in March of 1966. For their outstanding achievement while acting as a blocking force in these operations, personnel from UDT ELEVEN were awarded the following: Two Bronze Stars with the Combat "V"; Seven Navy Unit Commendation Medals; Twelve Letters of Commendation; and the entire Team was awarded the Navy Unit Commendation.

Training Amidst War

Even though war places great demands upon Frogmen, UDT ELEVEN members continued training and acquired new skills during their 1967 WESTPAC deployment.

Three officers and four enlisted men established a recent first for UDT. They graduated from the HALO School operated by the U.S. Army's 1st Special Forces Group ABN, on Okinawa. HALO stands for: "High Altitude-Low Opening" parachuting. HALO might be compared with sport parachuting or sky diving... But this intense training has solid military application. With the ability to exit an aircraft many thousands of feet above the ground...loadẽd with full combat equipment...the parachutist will free-fall unseen by the enemy until that last safe moment for his parachute to deploy. His close proximity to the ground enables pin point accuracy in landing, with the entire group assembled in scant minutes and combat ready.

Frogmen also established another UDT ELEVEN first. They served as instructors in Basic Airborne Training with the 1st Special Forces Group on Okinawa. The few remaining "Legs", or non Airborne types, were pulled from the far flung UDT ELEVEN detachments and assembled in Okinawa. Instructors and trainee alike, all agree that UDT oriented Basic Airborne Training makes the graduate feel head and shoulders above the normal "Airborne Trooper."

Navymen of UDT ELEVEN also completed a special Guerilla Warfare School conducted by U.S. Marines at Camp Hansen, Okinawa, and completed "Hard Hat", or Second Class Divers School at Subic Bay, Philippines.

Thirty-six UDT ELEVEN Frogmen transferred to SEAL Team ONE during this deployment. Eventually, 48 fresh graduates of UDT Training classes were assigned to UDT ELEVEN to bolster the depleated ranks.

Operating primarly out of Subic Bay, Philippines, UDT ELEVEN Frogmen broke up into several detachments for further deployment. Their operations included:

..River surveys for the Coastal Surveillance Forces in the Mekong Delta; ...Underwater demolitions in the Da Nang area; submarine operations and coastal recons aboard the USS BASHAW (AGSS-241) and USS TUNNY (APSS-282); UDT support for Amphibious Ready Group operations in Vietnam; joint Philippine-American operations and exercises in the southern Philippine Islands; and embarkation aboard the USS WEISS (APD-135) and USS COOK (APD-130) for many of the above deployments.

UDT OPERATIONS IN APOLLO SPACECRAFT RECOVERY

With the spacecraft landing in the recovery area, helicopters from the primary recovery ship are immediately dispatched to the point of splashdown. The first recovery helicopter on the scene moves in downwind of the floating capsule where UDT swimmers and a flotation collar are dropped. The other helicopters provide backup personnel and reserve equipment and may also be used to retrieve any additional spacecraft components located in the area. Items retrieved might include the main parachute, the capsule apex cover, and detached fragments of the heat shield. However, such secondary recovery action would occur if it does not interfere with the primary task of astronaut and spacecraft recovery.

Navy UDT swim teams designated for spacecraft recovery duties have undergone many hours of exacting training under NASA guidance to insure their familiarity with the special hazards and procedures required in their work. For example, they are trained to avoid explosive pyrotechnic devices on the spacecraft which may not have fired during the mission; and to be constantly alert to the dangers of toxic fumes or sudden chemical fires in the areas of the spacecraft reaction control thrusters.

In addition to the standard SCUBA equipment carried by each swimmer, each three-man recovery team is equipped with one spacecraft flotation collar, three 8-foot diameter sea anchors and a six-man life raft.

The Apollo flotation collar was developed by engineers of NASA's Landing and Recovery Division to improve spacecraft stability and prevent it from sinking. The collar also provides an essential work platform around the spacecraft. It is made of five-ply life raft fabric and is inflated when attached around the aft heat shield.

After the swimmers and flotation collar have been dropped to the capsule, the first helo is flown to a ready hover position which will not interfere with flotation collar installation. Another on-scene helicopter maintains communications with the task force commander, keeping him informed of progress in recovery operations.

The first swimmer attaches a sea anchor to the spacecraft to slow its drift. The sea anchor is similiar to a small parachute and effectively brakes downwind movement permitting other swimmers to overtake the spacecraft. Two swimmers then approach with the flotation collar, and when installation on the capsule is completed, a life raft is dropped for their use as a rest, security and work platform. All on-scene helos then assume hover positions around the spacecraft to await the arrival of the recovery ship.

To talk with the spacecraft crew before hatch opening, a UDT swimmer attaches an interphone headset to a communications plug which is automatically deployed by the spacecraft at splashdown. This connection also permits UDT swimmers to communicate with the recovery ship or aircraft by having the astronauts relay.

If the descent parachutes are still attached to the spacecraft, they must be collapsed and secured to the life raft. The chutes must be fully detached from the spacecraft and removed from the immediate vicinity to prevent interference with the approaching recovery ship.

Before being recovered, the astronauts will don their biological isolation garments. The crew will then be recovered and airlifted by helo to the recovery ship while the UDT swimmers perform any remaining operations aimed at securing the spacecraft for retrieval from the ocean. Retrieval procedures utilized depend upon the type of recovery ship arriving on the scene and weather conditions.

As the recovery ship nears the spacecraft, the swim team leader positions the swimmers to receive a retrieval line fired from the ship as it comes alongside the spacecraft. This line is hauled to the flotation collar on which the leader is waiting. From the ship's hoisting crane a specially designed retrieval device, called the Mercury Hook, is pulled out and attached to the shot line by ship's personnel. The hook is then pulled into the spacecraft by the swimmers until "slack" cable is obtained. The shotline is disconnected when the Mercury Hook is attached to a sturdy recovery loop located at the apex end of the spacecraft. The sea anchor is then disconnected and the swimmers leave the spacecraft for the life raft where they await completion of spacecraft retrieval.

The ship does not begin hauling in the line until the UDT leader determines that all is in correct order. Swimmers have been alerted to remain clear of the heavy, bobbing spacecraft during retrieval. When all checks are completed and swimmers are safely away from the spacecraft, the leader gives the "all clear" signal and hoisting operations begin. When the spacecraft is aboard the ship, the swimmers are recovered.

GLOSSARY OF TERMS

SHIPS

PRS — Primary Recovery Ship

SRS — Secondary Recovery Ship

CVS — Antisubmarine Warfare Carrier. Aircraft Carrier equipped with helicopters and propeller aircraft. Ship and aircraft especially configured for antisubmarine warfare.

LPH — Navy amphibious assault ship (Helicopter Carrier). Normally carries Marine assault troops who are deployed to shore by helicopter.

LKA — Amphibious Cargo Ship. These large cargo vessels carry the supplies and equipment needed to support amphibious assault landings.

LPA — Amphibious Transport. These ships carry Marine or Army assault troops and equipment to amphibious assault areas.

DL — Destroyer Leader. A specially equipped large destroyer with excellent control and communications facilities for coordination or multiple operations at sea.

DD — Standard Navy destroyer used in combat or support operations.

DDG — Guided Missile Destroyer. Destroyer equipped with surface-to-air missiles for protection of other ships.

AO — Fleet Oiler. Used to refuel other ships at sea.

AGMR — Communications relay ship used to provide long range communications capability to an operating force at sea.

LST — Tank Landing Ship. Transports loaded vehicles and combat ready troops directly on the beach or over a pontoon causeway during amphibious operations.

ATF — Fleet Ocean Tug. Heavy towing service with search and rescue as a secondary mission.

MCS — Mine Countermeasures Support Ship. Transports, maintains and supports minesweeping launches and helicopter minesweepers in forward areas in support of amphibious landing operations.

AIRCRAFT

COD — Carrier Onboard Delivery. Provides delivery capability for personnel, film and data between aircraft carriers and land bases.

AIR BOSS AIRCRAFT Aircraft of on-scene executive agent of the Task Force Commander. Directs on scene search, commands and controls other aircraft, takes action to insure safety of swimmers and pararescuemen and provides running commentary of recovery operations.

AIR BOSS Air On-Scene Commander.

ARRS AIRCRAFT Aerospace Rescue and Recovery Service HC-130 with long range electronic search and location capability and carries pararescuemen swimmers for spacecraft collaring capability.

ARIA JC-135 aircraft (Air Force Eastern Test Range) with telemetry and electronic search capability, provides "S" band high frequency, tracking capability and can function as radio relay.

RECOVERY HELICOPTER SH-3 "Sea King" built by Sikorsky; equipped with special Sarah radio beacon receivers. Provides homing capability for location of spacecraft, delivers UDT swimmers for collaring of spacecraft, provides medical personnel and assistance to astronauts as needed. Transports astronauts to recovery vessel. Voice call is "Recovery 1", or other appropriate number.

PHOTO HELICOPTER SH-3. Carries NASA and Navy photographers, provides photographic documentation of recovery operations and is prepared to assume duties of AIR BOSS. Voice call is "Photo 1" or other number if more than one.

MISCELLANEOUS

SPLINTER SHIELD (Pacific)
HONEY BEE (Atlantic) Reserved air space for events such as spacecraft landing or air support operations (other aircraft are warned not to enter).

SARAH Electronic search and detection devices used in recovery aircraft for detection and location of Command Module at time of landing.

TACAN Tactical Air Navigation. Electronic device in aircraft which uses signal emitted by ground stations to determine own distance and direction from the ground station.

SAR Search and Rescue. Special Air Force and/or Navy units whose functions is the airborne location of missing aircraft or spacecraft.

SURFACE BOSS On Scene Commander. Usually is Commanding Officer of the primary recovery ship.

CM BEACON Radio beacon transmitter in spacecraft activated by astronauts immediately prior to Command Module splashdown.

UDT Navy Underwater Demolition Team swimmers who install flotation collar.

CIC Combat Information Center. On recovery ship provides central location for display of current operations information including RADAR. Permits commander to rapidly evaluate situations and take expeditious action.

RESCUE Voice call of U.S. Air Force Rescue and Recovery Service aircraft of HC-130 type. Carry pararescue swimmers who support recovery operations in same function as UDT swimmers.

PJ's Air Force pararescue swimmers who perform same functions as UDT swimmers. Normally PJ's operate in support of contingency recovery operations.

PRI-FLY Primary Aircraft Launch and Recovery Control Center. Located in island structure of aircraft carrier overlooking the flight deck.

SICK BAY The medical center or hospital facility aboard Navy ships.

RCC Atlantic or Pacific Recovery Control Center. A land based facility normally manned by the staff of the appropriate recovery force commander during space mission support operations. Provides central location for control communications, display of mission, and of task force recovery status and related operations.

CHOP Navy term meaning that a ship, unit, or force has reported to a Force Commander for his control and use.

HF BEARING High frequency radio detection equipment in an aircraft or ship indicates a compass direction from the aircraft to an emitting source (radio beacon or radio transmitter) in another aircraft, ship or spacecraft.

DATUM That point where the object of search should be according to all available data.