

APOLLO 16

PRESS KIT



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APOLLO 16 MISSION

The Apollo 16 spacecraft is scheduled for launch on Apr. 16, 1972 from Complex 39A at the Kennedy Space Center, Florida by the Saturn V launch vehicle. Crewmen are mission commander John W. Young, command module pilot Thomas K. Mattingly II and lunar module pilot Charles M. Duke Jr.

Objectives of the mission, to last up to 12 days, as outlined by NASA: to perform selenological inspection, survey and sampling of materials in a preselected region of Descartes using a lunar roving vehicle; deploy and activate Apollo surface experiments; develop man's capability to work in the lunar environment; obtain photographs of candidate exploration sites; and to conduct inflight experiments and photographic tasks in lunar orbit.

Following launch, the spacecraft will reach Earth Parking Orbit and remain in orbit for about two and one-half revolutions prior to Trans-lunar Injection. Next, the Command and Service Module docks with the Lunar Module and the spacecraft "coasts" to the moon. In orbit around the moon, the Command and Service Module/Lunar Module combination will descend to within 50,000 feet of the lunar surface before undocking. The Lunar Module will continue to descend while the Command and Service Module returns to an orbit approximately 60 miles high.

Stay time on the lunar surface is scheduled for approximately 73 hours. The ascent stage of the Lunar Module then lifts the astronauts back into lunar orbit where they will dock with the Command/Service Module. The Lunar Module is jettisoned and Transearth Injection follows. Just prior to reentry into the earth's atmosphere, the Service Module is jettisoned, and the astronauts in the Command Module splashdown in the Pacific Ocean. The target point for end-of-mission splashdown is at 05 degrees 0 minutes north latitude and 158 degrees 40 minutes west longitude or approximately 985 nautical miles south of Honolulu, Hawaii. Splashdown is scheduled for Apr. 28, 1972 at 10:30 a.m. Hawaiian Standard Time (2:30 p.m. CST).

Recovery forces for Apollo 16, stationed in both the Atlantic and Pacific Oceans, will consist of three ships, nine aircraft and nearly 1,700 personnel. CTF-130 (Manned Spacecraft Recovery Force, Pacific) forces will be stationed south of Hawaii. Three ships, eight helicopters and three Air Force HC-130H aircraft, and nearly 1,100 personnel, will take part. Task Force 140 (Manned Spacecraft Recovery Force, Atlantic), comprising one ship, six HC-130H aircraft, three helicopters and approximately 300 personnel, will be positioned for possible launch abort operations. Two ships in the Atlantic will also be used for acoustical testing. Other forces, primarily aircraft and personnel of the Air Force Aerospace Rescue and Recovery Service will be on alert around the world for contingency recovery support.

NAVY 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, naval forces also have primary recovery 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.

The 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. Commander Task Force 130 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 sixth 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 DOD Manager, who sits next to the NASA Mission Director in Mission Control Center during the period of each space flight. Throughout the mission, the DOD Manager maintains direct communication with recovery force commanders and, working in concert with the Mission Director, recommends to the force commanders action required to effect timely recovery of the astronauts and their spacecraft.

Preparatory to each such space mission, Navy recovery forces assume designated area readiness stations. With responsibility for coordination of Atlantic Command area recovery operations,

Commander Task Force 140 and his staff guide operations from the Recovery Control Center, Atlantic at the Naval Air Station, Norfolk. Pacific recovery operations are controlled from the Recovery Control Center, Pacific on the Island of Oahu. During the prelaunch 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 are maintained with all assigned Atlantic and Pacific recovery units and the DOD Manager at Mission Control at Houston enabling the task force commanders to immediately and effectively react to recovery requirements.

The initial stations occupied by recovery forces 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 and 11, when bad weather forced NASA to add an additional orbit to Apollo 9 and to move the landing point on Apollo 11.

The reentry and splashdown accuracy obtained in the early Apollo flights permitted the release of some recovery ships after earth orbital insertion, and after translunar injection on Apollo lunar missions.

The Apollo 13 mission experienced a serious Service Module explosion as it neared the moon which necessitated a return to earth without a lunar landing. For the first time during Apollo lunar missions, a real possibility existed for a landing in the Indian Ocean or in the South Atlantic Ocean. However, a final mid-course correction eliminated these contingency landing sites and again the landing accuracy obtained in previous Apollo missions was achieved for Apollo 13.

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 record of successful recoveries. Naval forces will continue to provide this same professional level of support for forthcoming Apollo missions.

APOLLO 16 POSSIBLE CONTINGENCY LANDING SITUATIONS

1. Launch Aborts To Landing

There are six different launch abort procedures. The first three result in a termination of the launch sequence and a Command Module (CM) landing in the launch abort area.

a. MODE I: This abort procedure is designed for safe recovery of the CM following an abort initiated between launch escape system (LES) arming (40 minutes before launch) and launch escape tower (LET) jettison (3 minutes and 16 seconds after launch). The procedure consists of the LET pulling the CM off the launch vehicle and propelling it to a safe distance away from the launch vehicle. The resulting landing point would be near the ground track between the vicinity of the launch site and approximately 510 nautical miles downrange.

b. MODE II: This abort could be performed from the time the LET is jettisoned until the full-lift CM landing point reaches 3,200 miles downrange (approximately 10 minutes after launch). The procedure consists of separating the Command Service Module (CSM) from the launch vehicle, separating the CM from the Service Module (SM), and then letting the CM free fall to entry. The entry would be a full-lift, or maximum range trajectory, with a landing on the ground track between 440 and 3,200 nautical miles downrange.

c. MODE III: This abort procedure could be performed from the time the full-lift CM landing range reaches 3,200 nautical miles downrange until an orbital trajectory is achieved (approximately 12 minutes after launch). The procedure consists of separating the CSM from the launch vehicle and then, if necessary, performing a retrograde burn with the Service Propulsion System (SPS) so that the half-lift CM landing point is no farther than 3,350 nautical miles downrange. The CM would then be separated from the SM and a half-lift CM entry would be flown, with the resulting CM landing point approximately 70 nautical miles south of the ground track between 3,000 and 3,340 nautical miles downrange. This procedure is designed to prevent a landing in Africa.

2. Launch Aborts To Orbit

The second three launch abort procedures are essentially alternate launch procedures and result in insertion of the spacecraft into a safe earth orbit. The CSM/LM or CSM alone could then remain in earth orbit to carry out an alternate mission, or, if necessary, return to the West Atlantic or Mid-Pacific Ocean after one or more revolutions. These three modes of abort are preferred over a Mode II or Mode III abort and would be used unless an immediate return to earth during the launch phase is necessary. In order to simplify the explanation of the procedures, they are discussed in the reverse order in which they would become possible.

a. MODE IV AND APOGEE KICK--This abort procedure is an abort to earth parking orbit that could be performed any time after the SPS has the capability to insert the CSM into orbit. The procedure consists of separating the CSM from the launch vehicle and, shortly afterward, performing a posigrade SPS burn to insert the CSM into earth orbit.

At any time during the third stage (S-IVB) burn portion of the launch phase the CSM has the capability to insert itself into orbit if the S-IVB should fail. "Apogee Kick" is a variation of the Mode IV abort, where the SPS burn to orbit is performed at or near the first spacecraft Apogee. The main difference between the two is the time at which the posigrade SPS burn is performed.

b. S-IVB EARLY STAGING--Under normal conditions, the S-IVB is inserted into orbit with enough fuel to perform the Translunar Injection (TLI) maneuver. If it becomes necessary to separate from a malfunctioning S-II stage, this fuel can be used during the launch phase to ensure that the spacecraft is inserted into a safe parking orbit.

c. S-IVB EARLY STAGING TO MODE IV--Should it become necessary to separate from a malfunctioning S-II stage, the S-IVB could impart sufficient velocity and altitude to the CSM to allow the SPS to be used to place the CSM into an acceptable earth orbit. The procedure is a combination of S-IVB early staging and Mode IV procedures.

3. Earth Parking Orbit Aborts

Once the CSM is safely inserted into earth parking orbit, a return-to-earth abort would be performed, if necessary, by utilizing the SPS to perform a retrograde burn to place the CM on an atmosphere-intersecting trajectory. After entry, the CM would be guided to a pre-selected target point. This procedure would be similar to the deorbit and entry procedure performed on the Apollo 7 and 9 earth orbital flights.

4. Translunar Coast Aborts

Should problems occur which would require the termination of the mission, abort data would be passed to the crew. In the event of loss of communications, block data previously stored aboard the spacecraft would be utilized by the flight crew to terminate the flight and target the spacecraft for a safe water landing.

The abort maneuver is a retrograde burn which provides for a direct return to earth for the CM. The longitude of landing is determined by the time at which the abort is initiated and the resulting trajectory. The latitude of CM landing will be within approximately 5 degrees of the latitude at which TLI occurred.

Whenever possible, a required abort will be initiated at TLI plus 90 minutes or one of the following ground elapsed times: 8, 15, 25, 35, 45, or 60 hours.

The TLI plus 90 abort will target the CM to land at the Atlantic Ocean Line for a normal launch on any azimuth and either TLI opportunity. All other block data will target the CM to the MPL. The crew may do a time-critical abort, which would provide a minimum return time to an unspecified landing area or to the closest available recovery line. A fuel-critical abort provides for a slow return to a recovery line, based upon the propulsion system limitation causing the abort.

As the distance between the spacecraft and the moon decreases, the return time to earth increases. At a point near the moon's sphere of influence, the return-to-earth time becomes less for a circumlunar abort than for a direct return-to-earth abort.

5. Lunar Orbit Insertion (LOI) Aborts

The LOI burn transfers the CSM/Lunar Module (LM) from its translunar trajectory to the lunar parking orbit (LPO). Premature termination of the LOI maneuver places the vehicle on an abnormal trajectory, from which either an alternate mission or an abort may result.

If an inadvertent SPS shutdown occurs early in the LOI burn, the flight crew will initiate an immediate SPS restart. If the restart is unsuccessful and an abort situation exists, the LM descent propulsion system (DPS) engine is used for the abort maneuver.

If no LOI burn is performed, an abort would be initiated two hours after the predicted LOI time. The earliest return to the MPL would have a return time of 42 hours, using the SPS in either the docked or undocked configuration. The next solution to the MPL has a return time of 66 hours using either the SPS or DPS and in either the docked or undocked configuration. Three solutions to the AOL are available, using the SPS docked with the LM or using the DPS in the docked configuration. These solutions have return times of 32, 57 and 81 hours respectively. The minimum return time for the CSM only is 27 hours if the landing longitude is unspecified.

6. Lunar Orbit Aborts

After LOI has been successfully completed, an abort to return the spacecraft to the earth is essentially an early transearth injection maneuver. During the lunar orbit phase of the mission, an abort is possible only at one time during each revolution.

7. Transearth Injection (TEI) Aborts

Should the TEI burn terminate early, an immediate engine restart would be attempted. If this is not possible the restart attempt would be delayed, dependent on how much of the TEI burn had been completed before engine shutdown.

8. Transearch Coast Aborts

From TEI until entry minus 24 hours, the only abort procedure that would be performed would be to use the SPS or the SM/Reaction Control System (RCS) for a posigrade burn that would decrease the transearch flight time and change the longitude of landing. Since the normal TEI maneuver targets the CM to the MPL, the spacecraft will not have the capability to land in the Atlantic Ocean unless an abort is initiated immediately after TEI, with the resultant landing point in the West Atlantic. After 24 hours prior to entry, no further burns to change the landing point will be performed. This is to ensure that the CM maintains the desired entry velocity and flight path angle combination that will ensure a safe entry.

RECOVERY PROCEDURES

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 parachutes, 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 specially designed life rafts.

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 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 of recovery operations.

The first swimmer attaches a sea anchor to the spacecraft to slow its drift. The sea anchor is similar 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, life rafts are 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 astronaut recovery helo.

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 a 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.

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.

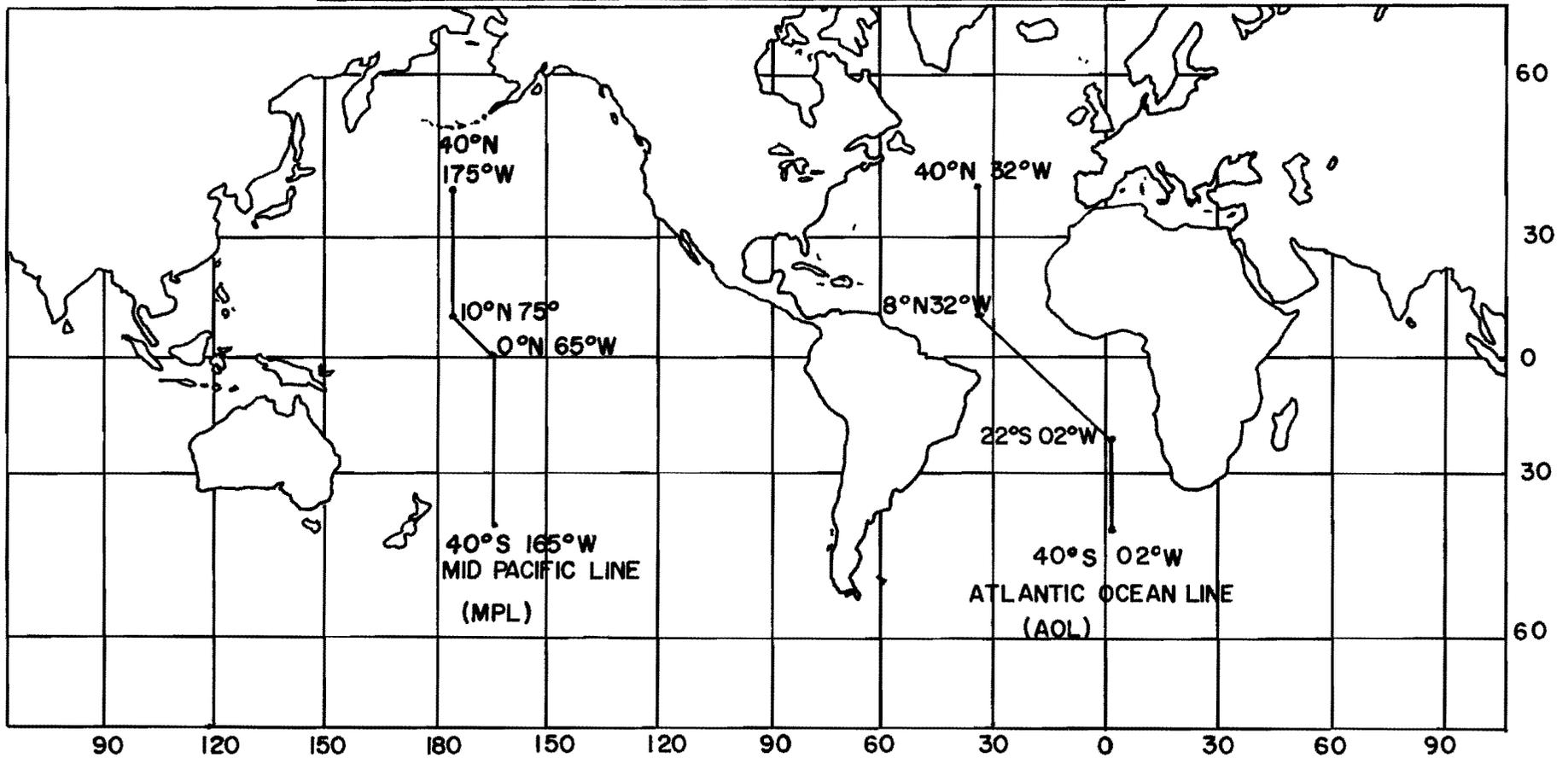
As the recovery ship nears the spacecraft, the swim team leader positions the swimmers to receive a retrieval line fired from the ship as it comes alongside the spacecraft. This line is hauled to the flotation collar on which the leader is waiting. A special device called a "Mercury Hook" is pulled out to the spacecraft by the swimmers. The hook is then attached to a sturdy recovery loop located at the apex end of the spacecraft. The sea anchor is then disconnected and the swimmers depart the spacecraft to a 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 on board the ship, the swimmers are recovered.

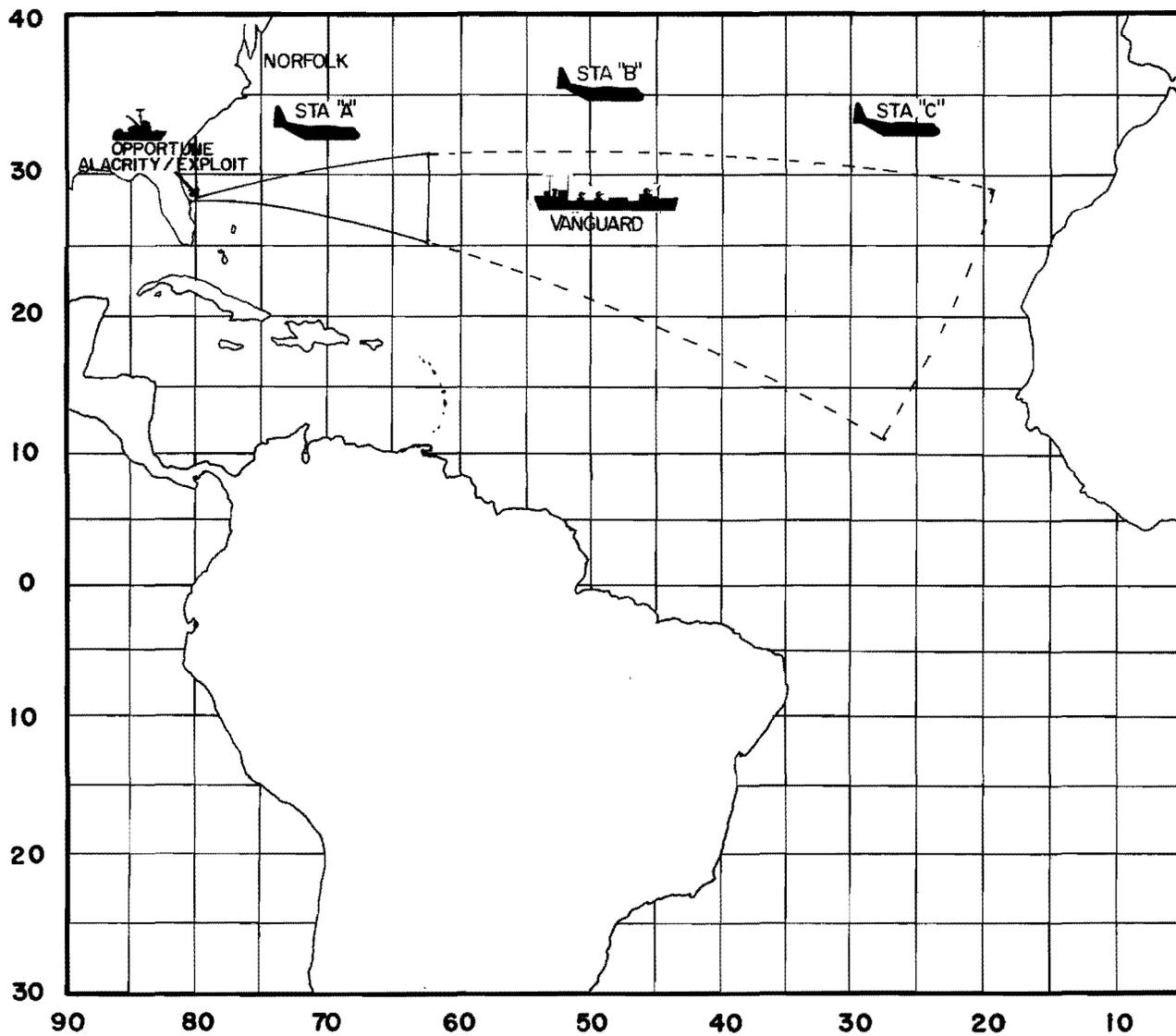
	NORFOLK	CHARLESTON	MAYPORT	CAPE KENNEDY	KEY WEST	BERMUDA	SAN JUAN	CANARY ISLAND	CAPE VERDE	ASCENSION	STATION 1
NORFOLK		386	532	589	863	683	1252	3130	3100	4720	490
CHARLESTON	386		163	258	573	767	1138	3341	3165	4880	480
MAYPORT	532	163		123	450	835	1111	3457	3290	4960	515
CAPE KENNEDY	589	258	123		320	840	973	3378	3320	4975	524
KEY WEST	863	573	450	320		1093	966	3545	3399	4950	740
BERMUDA	683	767	835	840	1093		856	2548	2410	4055	337
SAN JUAN	1252	1138	1111	973	966	856		2770	2460	5005	740
CANARY ISLAND	3130	3341	3457	3378	3545	2548	2770		750	2005	2900
CAPE VERDE	3100	3165	3290	3320	3399	2410	2460	750		2310	2720
ASCENSION	4720	4880	4960	4975	4950	4055	5005	2055	2310		4160
STATION 1	490	480	515	524	740	337	740	2900	2720	4160	

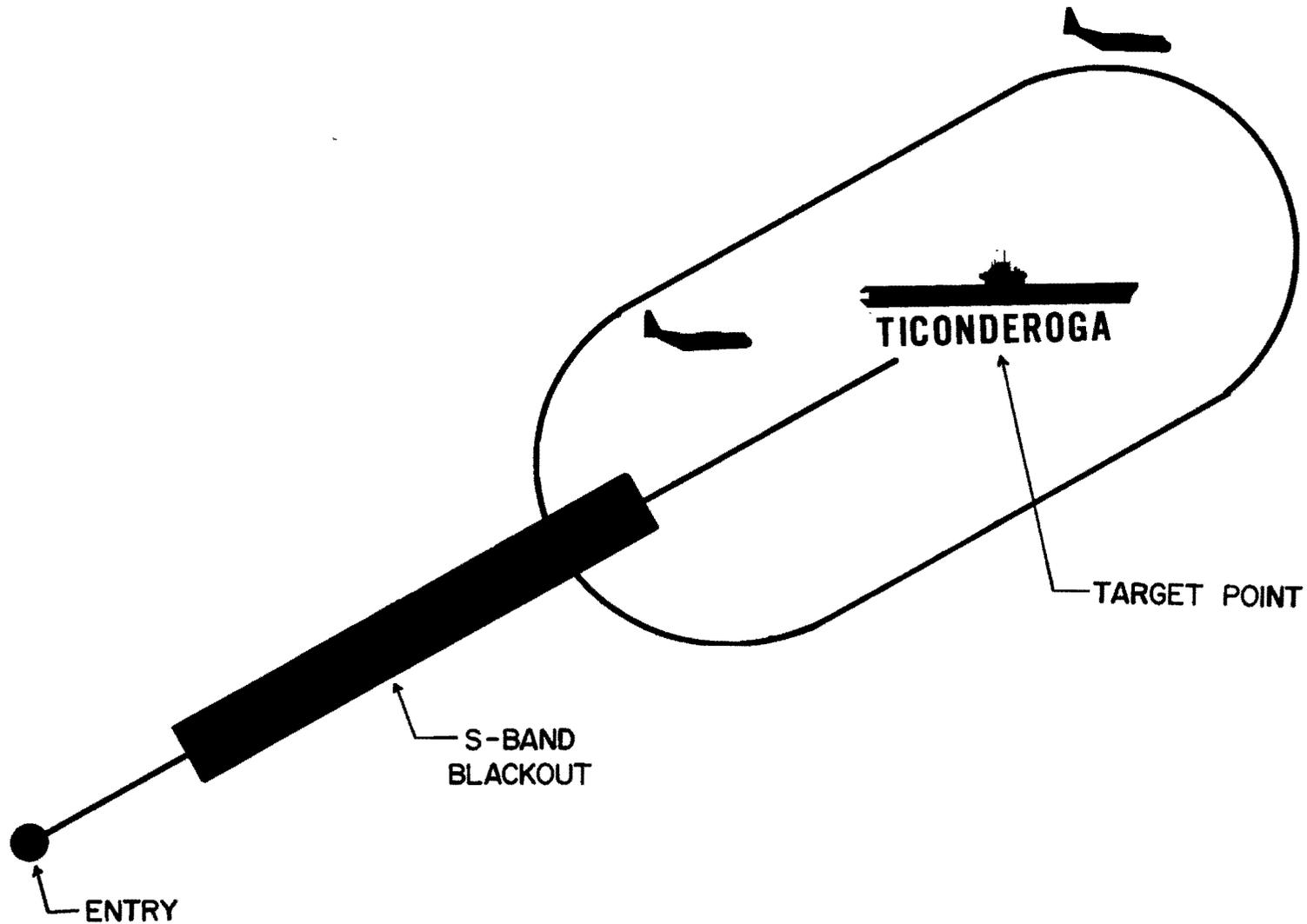
Distance Point-to-Point (Atlantic)

TAB C TO APPENDIX I TO ANNEX A
LUNAR MISSION RECOVERY LINES



FORCES ARRAY FOR LAUNCH





PRIMARY LANDING AREA AND FORCE DEPLOYMENT

MANNED FLIGHT RECOVERY CHRONOLOGY

MISSION #	RECOVERY DATE	PILOT(s)	RECOVERY SHIP	OCEAN
<u>Mercury</u>				
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
<u>Gemini</u>				
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
<u>Apollo</u>				
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
AS-506 Apollo 11	24 July 1969	Neil A. Armstrong Edwin E. Aldrin, Jr. Michael Collins	HORNET CVS-12	Pacific
AS-507 Apollo 12	24 Nov 1969	Charles Conrad, Jr. Richard F. Gordon, Jr. Alan L. Bean	HORNET CVS-12	Pacific
AS-508 Apollo 13	17 Apr 1970	James A. Lovell, Jr. John L. Swigert, Jr. Fred W. Haise, Jr.	IWO JIMA LPH-2	Pacific
AS-509 Apollo 14	9 FEB 71	Alan B. Shepard, Jr. Stuart A. Roosa Edgar D. Mitchell	NEW ORLEANS LPH-11	Pacific
AS-510 Apollo 15	7 AUG 71	David R. Scott James B. Irwin Alfred M. Worden	OKINAWA LPH-3	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 with 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 Operations for recovery duty 24 hours prior to each launch. From Mission Control Center, Houston, 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 who direct all assigned recovery forces in their area of responsibility to meet mission requirements established by NASA.

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 Cruiser-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 Nov. 26, 1965.

During the final days of 1965, CTF-140 conducted recoveries of Gemini missions 6 and 7.

1966 was a year of continued growth of the U.S. 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.

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

On May 26, Rear Admiral Thomas A. Christopher relieved Rear Admiral Abhau as Commander Manned Spacecraft Recovery Force, Atlantic. On July 1, the command was designated a shore duty billet for assigned personnel. In August, construction of the Recovery Control Center, began in the headquarters building at NAS Norfolk.

On November 2, CTF-140 and his operational staff deployed to Cape Kennedy, for the Apollo 4 mission. Recovery units for this first launch of the Saturn V 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 from Helicopter Anti-submarine 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 USS BENNINGTON.

In addition to a possible Apollo 4 command module recovery because of 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 was deactivated and installed equipment removed to Norfolk for installation in Recovery Control Center, Atlantic. All space flight recovery operations scheduled for the Atlantic are now directed from Norfolk. The Recovery Control Center was completed in late January and was dedicated by Commander in Chief, U.S. Atlantic Fleet on Feb. 1, 1968. It is located in the headquarters building, SP-71, Naval Air Station, Norfolk.

Apollo 5 was launched from Cape Kennedy on 9 February. This mission launched an unmanned, non-recoverable Lunar Module into orbit using an updated Saturn I booster.

Communications exercises were conducted on March 5 with un-alerted 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 the normal recovery area.

During the period of 1-9 April, an evaluation of the NASA Mobile Quarantine Facility (MQF) 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 returned from the lunar surface.

On 4 April, Apollo 6 was launched from Cape Kennedy, completing 2-3/4 revolutions of the earth before being recovered in the Pacific recovery area by USS OKINAWA (LPH-3). USS AUSTIN (LPD-4) in the Atlantic with her helicopters and underwater swimmers was assigned the task of retrieving six camera cassettes which were to be ejected after first and second booster stage separation. Two cassettes were ejected, both of which were retrieved at sea and returned for NASA engineers to evaluate.

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.

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 by 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 force commander. Captain Sims resumed duties as Chief of Staff.

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 handler LP-2, the command module was deactivated by NASA and North American Rockwell technicians, and then flown to California for a complete engineering study.

Apollo 8 was launched on 21 December and was recovered on 27 December by the USS YORKTOWN (CVS-10) in the Pacific, 1,000 miles south of Hawaii, successfully completing the first lunar orbital mission.

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 amphibious cargo ship USS ALGOL (LKA-54), both on their initial recovery duty, also conducted at-sea training in preparation for the scheduled Feb. 28th launch.

Also, during the month of January, the Mobile Quarantine Facility was tested on board GUADALCANAL and destroyer USS MYLES C. FOX (DD-829). Other units assigned to the Apollo 9 mission included Helicopter Anti-submarine Squadron THREE, Underwater Demolition Team TWENTY-TWO, and USS PAIUTE (ATF-159), the in-port standby rescue salvage ship.

Apollo 9 was launched on March 3 and splashed down on March 13 in the Atlantic, 400 miles north of Puerto Rico when bad weather necessitated a change in the primary recovery area.

Apollo 10, the second manned lunar mission, was launched on May 18 and recovered on May 26 by USS PRINCETON (LPH-5) in the Pacific, 349 miles southeast of American Samoa. Atlantic Fleet units supporting this mission were USS OZARK (MCS-2) USS CHILTON (LPA-38); USS RICH (DD-820) and USS SALINAN (ATF-161).

Apollo 11, the first manned lunar landing, was launched on July 16, 1969 and was recovered in the Pacific on July 24. During this mission, Astronauts Neil Armstrong and Edwin E. Aldrin Jr., became the first two men to set foot on the moon. Recovery was made by USS HORNET (CVS-12). Units in the Atlantic Fleet supporting the mission were destroyer USS NEW (DD-818); USS OZARK (MCS-2) and USS SALINAN (ATF-161). Nine Air Force HC-130H Rescue Aircraft were assigned mission support.

On October 2, 1969, CTF-140 received NASA's Group Achievement Award. Then on October 16, a Certificate of Appreciation was presented to the commander by NASA's Manned Spacecraft Center, Houston, Texas. These awards were for outstanding services as recovery force for Apollo missions in the Atlantic.

Apollo 12, man's second voyage to the surface of the moon, was launched on November 14 and was recovered in the Pacific by USS HORNET (CVS-12) on November 24. Astronauts Charles Conrad and Alan Bean conducted extensive investigations of the lunar surface as Richard Gordon maintained a vigilance from the orbiting command module. Units in the Atlantic supporting this mission were:

USS HAWKINS (DD-873); USS AUSTIN (LPD-4); USS ESCAPE (ARS-6); and a four helicopter detachment from Helicopter Anti-submarine Squadron FIVE on launch abort standby on board an aircraft carrier operating off the eastern seaboard. Ten Air Force HC-130H Rescue Aircraft were assigned mission support.

On January 9, 1970, Rear Admiral William S. Guest relieved Rear Admiral Philip S. McManus as Commander.

Apollo 13 was launched on April 11, 1970. 55 hours later the lunar mission was aborted and the astronauts began their return to earth. The lunar module was used to place the spacecraft on a free return trajectory and supported the astronauts for the remainder of the flight. On Friday, April 17, the astronauts were recovered by USS IWO JIMA (LPH-2) approximately 530 miles southeast of American Samoa. Atlantic Fleet units supporting the mission were: USS NEW (DD-818); USS ESCAPE (ARS-6), the in-port standby ship; a detachment from Helicopter Anti-submarine Squadron THREE, on standby at Quonset Point, R.I.; and a WC-121N weather aircraft from Weather Reconnaissance Squadron FOUR. Eleven Air Force HC-130H Rescue Aircraft were assigned mission support.

On July 22, 1970, Manned Spacecraft Recovery Force, Atlantic was awarded the Meritorious Unit Commendation by the Secretary of the Navy for meritorious service from July 1, 1967 to July 26, 1969.

On August 26, 1970, Rear Admiral Richard R. Pratt, Commander Service Force, U.S. Atlantic Fleet relieved Rear Admiral William S. Guest as commander.

Apollo 14 was launched from Cape Kennedy on 31 January 1971 and was recovered some 760 nautical miles south of American Samoa in the south Pacific by the primary recovery ship USS NEW ORLEANS (LPH-11). Units assigned to support this mission in the Atlantic were USS SPIEGEL GROVE (LSD-32), USS HAWKINS (DD-873), USS PAIUTE (ATF-159), a detachment of helicopters from Helicopter Anti-submarine Squadron SEVEN and six, HC-130H aircraft from the U. S. Air Force Aerospace Rescue and Recovery Service.

During the period 1-10 May, CTF-140 Communications Department assisted Commander Fleet Electronic Warfare Support Group, Atlantic (FEWSG) during EXOTIC DANCER IV by providing communications support.

On 27 May, Rear Admiral Roy G. Anderson relieved Rear Admiral Richard R. Pratt as Commander Service Force, U.S. Atlantic Fleet with additional duties as Commander Manned Spacecraft Recovery Force, Atlantic (CTF-140).

During the period 6-22 June, staff communications assisted FEWSG by providing communications support for an Operational Readiness exercise. The Recovery Control Center, Atlantic was made available to FEWSG as their Control Center for this exercise. Also

during the month of June, CTF-140 conducted two simulated mission abort exercises for staff personnel in the Recovery Control Center to prepare for the scheduled 26 July launch of Apollo 15.

July 1971 proved to be a busy month for the Atlantic recovery personnel. USS AUSTIN (LPD-4), primary Atlantic support ship, went to sea on 14 July for training exercises with the boilerplate. On 23 July, launch abort training exercises were conducted in the Recovery Control Center, Atlantic to prepare for the launch the following Monday of Apollo 15. Then, on 24 July, communications exercises were held with various merchant ships at sea to evaluate their capability for supporting Apollo recovery operations on a "Ship of Opportunity" basis.

Apollo 15, America's most ambitious space mission thus far, was launched from Cape Kennedy on 26 July 1971 and was recovered some 316 miles north of Oahu, Hawaii by USS OKINAWA (LPH-3), 12 days later. Units assigned to support this mission in the Atlantic included USS AUSTIN, USS SALINAN (ATF-161), a detachment of helicopters from Helicopter Anti-submarine Squadron THREE and three HC-130H aircraft from the U. S. Air Force Aerospace Rescue and Recovery Service.

REAR ADMIRAL ROY G. ANDERSON
COMMANDER TASK FORCE ONE FOUR ZERO

Roy Gene Anderson was born in

He attended Neosho High School and Kansas State Teachers College, Pittsburg, prior to entering the U.S. Naval Academy, Annapolis, Maryland on appointment from his native state in 1936. Graduated and commissioned Ensign on June 6, 1940, he subsequently advanced in rank to that of Rear Admiral to date from December 1, 1965.

Following graduation from the Naval Academy in 1940, he joined the USS MINNEAPOLIS and was serving with that cruiser in the Pacific at the outbreak of World War II. In November 1942 he received submarine training at New London, Connecticut, and reported on board USS FLYING FISH in March 1943. In April 1944 he reported on board USS KINGFISH, completing eight war patrols against the Japanese on the two submarines.

From June 1945 until June 1946 he was a student at the Postgraduate School, Annapolis, then continued graduate work at California Institute of Technology at Pasadena where he received a Master of Science degree in aeronautical engineering in June 1947. He next had duty in connection with guided missiles in the Bureau of Ordnance, and in March 1948 became Executive Officer of USS CUSK. In December 1949 he assumed command of USS CARBONERO and in November 1951 was assigned to the Office of the Chief of Naval Operations dealing with submarine-launched guided missiles. There he also had duty as the CNO REGULUS Project Officer. In November 1953 he reported as Operations Officer to Commander Submarine Squadron FIVE, and in May 1955 became Commander Submarine Division FIFTY-FIVE, a guided missile division. In December 1955 he reported as Plans Officer in the Special Projects Office, Navy Department.

In August 1958 he reported as Chief of Staff to Commander Submarine Squadron FOURTEEN, the first Polaris submarine squadron. In August 1960 he joined the Joint Staff of the Commander in Chief Atlantic, and from August 1962 to January 1963 he attended the Industrial College of the Armed Forces, Washington, D.C. Following this training he served as NATO Nuclear Planning Officer in the office of CNO, where he also served as Deputy to the Chairman, Multilateral Force Working Group. In August 1964 he assumed command of USS TACONIC (AGC-17) and in June 1965 became Commander Amphibious Group FOUR.

In March 1967 he reported as Senior Naval Member, Military Studies and Liaison Division, Weapons Systems Evaluation Group, Office of the Secretary of Defense. In February 1970 he reported as Director of the Long Range Objectives Group (Op-93) in the office of CNO and in August 1970 became the Director, Systems Analysis and Long Range Objectives Division (Op-96). It is from this assignment that Rear Admiral Anderson assumed command of the Service Force, U.S. Atlantic Fleet with additional

duty as Commander Manned Spacecraft Recovery Force, Atlantic on May 27, 1971.

Rear Admiral Anderson is authorized to wear the Legion of Merit with two Gold Stars, the Bronze Star Medal with Gold Star and Combat "V", and the Commendation Ribbon with Bronze Star and Combat "V".

His official home address

CAPTAIN JEAN R. POULIOT
CHIEF OF STAFF
TO
Commander Manned Spacecraft Recovery Force,
Atlantic (TF-140)

Captain Jean R. Pouliot, a native of Fall River, Mass., was commissioned Ensign following graduation from the Maine Maritime Academy in July 1949. He earned a Bachelor of Science degree in Marine Engineering.

His first active service was duty on board USS PHILIPPINE SEA (CVS-47). During his tour on board, the ship earned the Navy Unit Commendation and the Korean Presidential Unit Citation for its participation in combat operations off Korea.

In March 1952, he reported to the Naval Science Department at the Massachusetts Maritime Academy to instruct Merchant Marine Midshipmen. The captain remained there until January 1954 and then reported to USS NEW (DDE-818) for duty as Gunnery Officer.

After two years on board NEW, Capt Pouliot completed General Line School in Monterey, Calif., followed by Mine Warfare School, Charleston, S. C. In March 1957, he reported to U. S. Navy Ordnance Facility, Yokosuka, Japan for duty as the Underwater Ordnance Officer.

In October 1959, he became the Executive Officer on board USS DASHIELL (DD-659) and in February 1960 assumed command of that ship.

Following tours of duty as Executive Officer on board USS J. C. OWENS (DD-776) and USS MULLINIX (DD-944), he entered the Navy's Post Graduate School at Monterey. He was graduated on Dec. 19, 1963 with a Bachelor of Arts degree in Political Science/Foreign Affairs.

Capt Pouliot assumed command of USS GRAHAM COUNTY (LST-1176) in February 1964 and remained on board until March 1965. He then reported to the Atlantic Fleet Service Force staff as the Assistant Ordnance Office. In February 1967 he assumed command of USS BORIE (DD-704). During 1968 as a result of BORIE's participation as a fire support ship off the coast of the Republic of Vietnam, he earned the coveted Bronze Star medal with Combat "V".

In May 1969, he reported to the Chief of Naval Operations' staff as the War Plans Coordinator (Logistics) with additional duty as Navy Base Logistics Plans and Reduction Project Officer. Capt Pouliot reported to the Commander, U. S. Naval Forces, Vietnam staff in December 1970 as the Assistant Chief of Staff for Psychological Warfare where he earned a second Navy Unit Commendation.

Prior to reporting for duty as Chief of Staff, he temporarily served as Special Projects Officer on the Service Force, Atlantic staff.

In addition to the Bronze Star and the Navy Unit Commendation, he holds

the Korean Presidential Unit Citation, the Korean Service Medal (6 Stars), United Nations Medal, China Service Medal, National Defense Service Medal (2 Stars), the Navy Occupation Medal, the Vietnam Campaign Medal (4 Stars) and the Vietnam Service Medal.

Captain Pouliot is married
They and their five children presently reside in
Virginia Beach, Va.

USS OPPORTUNE (ARS-41)

USS OPPORTUNE was constructed by the Basalt Rock Company of Napa, Calif. Her keel was laid Sept. 13, 1944. She was launched on March 31, 1945, and commissioned on Oct. 5, 1945. She was quick to earn the right to bear her name as she used her portable salvage pumps to flood the lock in which she had been built.

USS OPPORTUNE is 213 feet, 6 inches long, and measures 44 feet at the beam. Propelled by four diesel-electric drive engines with a total of 2,440 shaft horsepower, OPPORTUNE is driven at a full speed of 14 knots or a more economical speed of 11 knots. Her fuel capacity of over 100,000 gallons allows her to sail almost halfway around the world without refueling.

OPPORTUNE is a unit of the Atlantic Fleet Service Force and is under the operational control of Commander Service Squadron EIGHT. The ship's mission is to salvage, provide lifting capability, patch, float, fight shipboard fires, repair and tow ships which have been battle damaged, stranded, beached, sunk, set afire, or abandoned at sea.

On Apr. 8, 1966, OPPORTUNE returned to Little Creek, Va., after 196 days away from home. In doing so she became the first Atlantic Service Force ship to sail around the world since World War II, and the first salvage ship in the U. S. Navy to circumnavigate the globe.

OPPORTUNE returned from a six-month Mediterranean deployment with the SIXTH Fleet in late October 1969. In addition to providing target services for the SIXTH Fleet she fought two major fires on board merchant ships, recovered a downed helicopter, provided personnel assistance in salvaging an Air Force jet, and refueled minesweepers at sea.

In March 1970 OPPORTUNE recovered a rocket payload from a depth of over 5,850 feet. The rocket had been used to photograph the March 7th solar eclipse which was visible along the eastern seacoast of North America. The recovery of the payload from a depth of over one mile was a world record for under-sea recovery.

In May 1970 the ship was awarded the Meritorious Unit Commendation for her meritorious achievement while deployed to the Mediterranean. In July 1971 she was awarded both the battle efficiency and engineering "Es" for the second consecutive year. The battle efficiency "E" stands for excellence and is awarded annually to a ship which best demonstrates the ability to carry out its assigned mission.

OPPORTUNE carries a crew of eight officers and 85 enlisted men. Of this total 14 officers and men are deep-sea divers with various qualifications. She is commanded by Lieutenant Commander Don C. Craft.

LIEUTENANT COMMANDER DON C. CRAFT
COMMANDING OFFICER
USS OPPORTUNE (ARS-41)

Lieutenant Commander Don C. Craft entered the Navy in 1943, and after graduating from Deep Sea Diver's School as a Second Class Diver, he reported on board USS HORNET (CV-12). He later served on board USS BON HOMME RICHARD (CV-31) and USS WANDANK (ATO-26). As a Boatswain's Mate he served tours of duty at the Naval War College, Newport, R.I., USS SCHMIDT (APD-76), USS ADIRONDACK (ACG-15), Harbor Defense Unit, New York, USS ROBIN (MSC-53), USS LINNET (MSC-23), USS CROSSBILL (MSC-45), and USS ALLAGASH (AO-93).

He served as Petty Officer in Charge of net defense at the U. S. Naval Station, Argentia, Newfoundland where he was commissioned an Ensign in 1958. He served at Harbor Defense School, Treasure Island, Calif., Naval Air Station, Alameda, Calif., and on board USS LAKE CHAMPLAIN (CVS-39). He was commanding officer of the Naval Reserve Training Center at Stamford, Conn., served as Security Officer at the U. S. Naval Station, Roosevelt Roads, Puerto Rico, and was Executive Officer of USS ASKARI (ARL-30) in Vietnam. His last tour was as First Lieutenant of USS GUAM (LPH-9).

LCdr Craft is married

Lieutenant Commander Craft has earned the Good Conduct (4 Stars), two Presidential Unit Citations, Navy Unit Commendation, American Theater, Asiatic Pacific (7 Stars), Victory Medal, World War II, National Defense Service Medal, Occupation Medal (European Clasp), Philippine Liberation Ribbon, Vietnam Service Medal and Vietnam Campaign Medal.

USS EXPLOIT (MSO-440)

The USS EXPLOIT is an all wooden hull, non-magnetic minesweeper designed to sweep all types of sea mines, conduct mine hunting operations, to act as a darning ship and to be capable of limited self-defense.

She was constructed by the Higgins Boat Company in New Orleans and commissioned in the naval service on March 31, 1954. USS EXPLOIT has a length of 173 feet, a beam of 35 feet and displaces 850 tons. She carries six officers and sixty-nine men.

The EXPLOIT is capable of continuous day and night sweeping operations with the fleet. Since her commissioning, she has served with the U. S. Sixth Fleet in the Mediterranean Sea on five different occasions, participated with U. S. amphibious forces in the Caribbean Sea on numerous occasions and has been involved in experimental work with the Mine Defense Laboratory at Panama City, Florida.

USS EXPLOIT is currently a unit of the Mine Warfare Force, Atlantic commanded by Rear Admiral James Dare. She is part of Mine Flotilla Two, and is commanded by Lieutenant Commander Will C. Rogers III.

LIEUTENANT COMMANDER WILL C. ROGERS
COMMANDING OFFICER
USS EXPLOIT (MSO-440)

Lieutenant Commander Will Chapel Rogers earned his baccalaureate degree from Baylor University and the Degree of Master of Arts in Economics and History from Trinity University.

He was commissioned in the Navy in December 1965 and served initially in USS INDEPENDENCE (CVA-62). Subsequently, he served on board USS GEORGE K. MACKENZIE (DD-836) as Main Propulsion Assistant and Combat Information Center Officer.

After completion of U. S. Naval Destroyer School, he served as Operations Officer in USS VREELAND (DE-1068).

Lieutenant Commander Rogers holds the Navy Commendation Medal with Combat "V".

LCdr Will Rogers is married

USS ALACRITY (MSO-520)

USS ALACRITY (MSO-520) is an ocean going minesweeper built by Perterson Builders of Sturgeon Bay, Wisc. Launched in June 1957 and commissioned in October 1958, ALACRITY is 191 feet long and displaces 800 tons.

During her twelve years of commissioned service, USS ALACRITY has performed admirably in operations ranging from daily services for the Naval School of Mine Warfare to major deployments in the Mediterranean and Caribbean Seas.

One such Caribbean deployment in 1965 found ALACRITY among the first United States ships to arrive on the scene of the Dominican Republic crisis, being ultimately responsible for the evacuation of 21 persons from the island.

In June 1970 ALACRITY entered Avondale Shipyard in New Orleans for a period of six months for overhaul. During this time she was extensively modernized by the addition of sophisticated communications and electronics equipment to enhance her mission capability.

Fully trained during recent refresher training periods, ALACRITY continues to make her contributions to the naval Mine Warfare forces.

LIEUTENANT BILLY G. TAYLOR
COMMANDING OFFICER
USS ALACRITY (MSO-520)

Upon completion of four years of enlisted service on board the USS BON HOMME RICHARD (CVA-31), Billy G. Taylor attended the University of Texas. After graduation, he received his BA degree and reported to Officer Candidate School, Newport, R.I. He was commissioned in October 1964.

Lt Taylor reported for duty to USS ALUDRA (AF-55) as Gunnery Officer and Assistant Navigator after he was commissioned. He then transferred to USS SNOHOMISH COUNTY (LST-1126) as First Lieutenant and later as the executive officer.

Lieutenant Taylor is a graduate of the Naval Destroyer School and he served as Engineering Officer on board USS WILLIAM C. LAWE (DD-763) just prior to reporting on board USS ALACRITY for duty as commanding officer.

Lt Taylor is married

HELICOPTER ANTISUBMARINE SQUADRON THREE

Helicopter Antisubmarine Squadron THREE (HS-3) was commissioned on June 18, 1952, at the Naval Air Facility, Elizabeth City, N. C. By December, the squadron was near full strength. Fourteen helos, the HUP-2 were received and extensive pilot and sonar operator training began. On Sept. 1, 1954, while moving to its home station from USS VALLEY FORGE, HS-3 was ordered to NAS Quonset Point, R. I. to assist in disaster relief after the ravages of Hurricane Carol. The squadron moved from Elizabeth City to Norfolk, Va., in early 1960.

In April 1960, HS-3 joined Task Group Bravo. Exercises with ASW units of the Canadian Navy in "Operation Shortstop" were a prelude to the formal commissioning on May 25 of Carrier Antisubmarine Air Group FIFTY-SIX. In September 1961 the first HSS-2s to be delivered to an operational squadron in the Atlantic were received. On May 24, 1962, HS-3 rescued Scott Carpenter after his space capsule, Aurora 7 had overshot the primary recovery ship by 200 miles. During the period of Oct. 26, to Nov. 23, 1962, HS-3 deployed on board the USS WASP to participate in the Cuban Blockade.

On Mar. 23, 1965, HS-3 participated in the recovery of the Gemini 3 space capsule. Astronauts Virgil Grissom and John Young were lifted from the "Molly Brown" by HS-3 and returned to USS INTREPID. On Mar. 31, HS-3 exceeded 30,000 accident-free hours, and in June won the Battle Readiness "E" for a record third consecutive year. In July, while operating from USS GUADALCANAL, HS-3 picked-up astronauts Young and Michael Collins from their Gemini 10 spacecraft. In September, this time flying the new SH-3D "Sea King" from the deck of USS GUAM, HS-3 lifted astronauts Richard Gordon and Charles Conrad from their Gemini 11 spacecraft.

In December 1968, a detachment went on board USS GUADALCANAL as back-up for the successful Apollo 8 mission. In February, a detachment again boarded the GUADALCANAL and successfully recovered the Apollo 9 astronauts. In June 1969, the squadron participated in Operation Sparkplug in the Carribean. In September, they embarked in USS YORKTOWN as part of Carrier Air Group FIFTY-SIX for a four-month tour to the North Atlantic.

In February 1970, HS-3 changed homeport to NAS Quonset Point, R.I., and became the Air Group for USS INTREPID. In April, HS-3 supplied a large detachment to USS INDEPENDENCE, giving the squadron its first taste of operations on board a large attack aircraft carrier. During September through December 1970, the squadron supplied ASW and plane guard services for USS FORRESTAL during the work-up period in preparation for a six-month deployment to the Mediterranean.

In January 1971, HS-3 departed Norfolk for the Mediterranean and in February rescued 18 crewmembers and two women passengers from a disabled Greek ore ship. A few days later, HS-3 provided transportation for the Secretary of the Navy and his party, during a tour of USS FORRESTAL and accompanying ships. The squadron returned to Quonset Point in early July 1971.

The squadron went on board USS WASP in September for "Operation LantCorTex". Then, in October, they again boarded WASP for "Operation CanUSEx", with the Canadian Navy.

HS-3 began the new year on board USS AUSTIN to participate in "Operation Snowy Beach". The squadron switched to USS FRANKLIN D. ROOSEVELT for the return from the "Snowy Beach" exercise.

In February-March, HS-3 then participated in "Operation Spring-board."

COMMANDER WARREN H. WINCHESTER
Commanding Officer
Helicopter Antisubmarine Squadron Three

Commander Warren H. Winchester was

. He attended schools in Mineral Springs, N. C., and was graduated from Pfeiffer Junior College, Misenheimer, N. C., prior to entering the Navy in August 1953.

Commissioned an Ensign, USNR, from the Naval Aviation Cadet Program on Aug. 9, 1955, he was designated a Naval Aviator on the same day, and received orders to "Lighter than Air" training. He was designated an LTA pilot on Feb. 1, 1956.

Cdr Winchester's first tour was with Air Ship Patrol Squadron TWO, Glynco, Ga. He spent only a short time with ZP-2 prior to transferring to the then-forming Air Ship Early Warning Squadron ONE, where he spent three years as a squadron pilot. During his tour there, he augmented to Regular Navy.

In June 1959, he reported to the U. S. Naval Postgraduate School, Monterey, Calif., and was graduated in July 1961. He received his Bachelor of Science Degree in Naval Science. In August, he was ordered to the U. S. Naval School, Preflight, Pensacola, Fla., and served as the Senior Leadership Instructor until May 1963 when he transferred to helicopters. He reported to HS-3 in December 1963.

During his tour with HS-3, he served as Training Officer and Maintenance Officer, and in March 1965 recovered astronauts Grissom and Young of Gemini Three. In December 1965, he reported to the Royal Canadian Navy Helicopter Antisubmarine Squadron, HS-50, Shearwater, Nova Scotia, for duty as an Exchange Officer. He served as Operations Office in HS-50 until his transfer to HS-1, Key West, Fla., in October 1967.

In December 1968, he reported for duty with Commander Fleet Air Key West, where he served as Assistant Chief of Staff for Maintenance. Before reporting to HS-3 as Executive Officer on May 14, 1970, he served with HS-1 for a brief period for replacement training.

Commander Winchester is married

REAR ADMIRAL HENRY S. MORGAN, JR., U. S. NAVY
COMMANDER TASK FORCE ONE THREE ZERO

Henry Sturgis Morgan, Jr.,
son of Henry S. and Catherine (Adams) Morgan. He attended Harvard University, Cambridge, Mass., from which he received a Bachelor of Science Degree in 1944. While there he was a member of the Naval Reserve Officers Training Corps and upon graduation was commissioned Ensign in the U. S. Navy, Oct. 20, 1944. He subsequently advanced in rank to that of Captain, to date from Feb. 1, 1966. His selection for the rank of Rear Admiral was approved by the President on Apr. 27, 1971.

After receiving his commission in 1944, he was ordered to USS AMSTERDAM (CL-101), which was being built at the Newport News, Va., Shipbuilding and Dry Dock Company. He joined that cruiser upon her commissioning on Jan. 8, 1945. After shakedown and training, the AMSTERDAM participated in the THIRD Fleet strikes against Japan and on Sept. 5, following the cessation of hostilities, steamed into Tokyo Bay. In March 1946 he transferred to USS SOLEY (DD-707) and from February to December 1947 continued duty afloat in USS WALDRON (DD-699).

He next had submarine training at the Submarine School, Submarine Base, New London, Conn., and in June 1948 joined USS PIPER (SS-409). While on board that submarine, he qualified in submarines, Aug. 7, 1949. In January 1951 he reported for instruction at the General Line School, Monterey, Calif., and during the period November 1951 to July 1954 served as Engineering and Executive Officer in USS BATFISH (SS-310), qualifying to command submarines in July 1953. Returning to the Submarine School in August 1954, he had duty as a Tactical Instructor there until July 1956, when he became Executive Officer on board USS GROUPE (SSK-214). In July 1957 he assumed command of USS TUSK (SS-426) and "...for outstanding performance of duty...(in that capacity) during a period in 1958..." was awarded the Navy Commendation Medal.

He joined the Staff of Commander Submarine Force, U. S. Atlantic Fleet in May 1959 and in August 1961 became Administrative Officer in the Office of the Supervisor of Shipbuilding, General Dynamics Corp., Electric Boat Division, Groton, Conn. From August 1963 to June 1964 he attended the Navy Management Course at the Naval Post-graduate School, Monterey, from which he received the degree of Master of Science. Following duty afloat as Executive Officer of USS FULTON (AS-11), he reported in August 1965 as Commander Submarine Division FORTY-TWO and in May 1966 returned to USS FULTON to serve as commanding officer.

In March 1968 he became Head of the Budget and Overhaul Schedule Branch/Budge Section, Ships Material Readiness Division, Office of the Chief of Naval Operations, Navy Department, Washington, D.C. He was awarded the Legion of Merit "...for exceptionally meritorious service...from March 1968 to December 1970..."

In February 1971 he assumed command of USS PROVIDENCE (CLG-6) and in June 1971 was ordered detached for duty as Deputy Chief of Staff for Logistics, Personnel and Administration to the Commander in Chief, U. S. Pacific Fleet.

In addition to the Legion of Merit and the Navy Commendation Medal, Rear Admiral Morgan has the American Campaign Medal; Asiatic-Pacific Campaign Medal with one star; World War II Victory Medal; Navy Occupation Service Medal, Asia and Europe Clasps and the National Defense Service Medal with bronze star.

His official home address is

HISTORY TASK FORCE 130

When America's astronauts splashdown from a lunar mission, responsibility for returning them safely to dry land falls to Task Force 130, the Manned Spacecraft Recovery Force, Pacific.

The longest Apollo expedition, Apollo 15, totalled 12 days, during which the astronauts explored the 1,200-foot deep Hadley Rille. Astronauts David Scott, James Irwin and Alfred Worden splashed down in the Pacific on Aug. 7, 1971 and were recovered by helicopter carrier USS OKINAWA, supported by the logistics ship, fleet oiler USS KAWISHIWI.

USS NEW ORLEANS served as the primary recovery ship for astronauts Alan Shepard, Stuart Roosa and Edgar Mitchell during the Apollo 14 mission. Support was provided by destroyer USS CARPENTER and fleet oiler USS PONCHATOULA.

USS IWO JIMA recovered astronauts James Lovell Jr., Fred Haise Jr., and John Swigert Jr., Apr. 17, 1970 after the abortive Apollo 13 mission. USS BENJAMIN STODDART, a guided missile destroyer, and fleet oiler USS KAWISHIWI were also assigned to the force.

Aircraft carrier USS HORNET served as primary recovery ship on Nov. 24, 1969 when Apollo 12 astronauts Charles Conrad Jr., Alan Bean and Richard Gordon Jr. returned from man's second lunar landing mission. USS JOSEPH STRAUSS, a guided missile destroyer was secondary recovery ship.

The most memorable mission of the force to date was the recovery of Apollo 11 astronauts Neil Armstrong, Edwin Aldrin Jr. and Michael Collins when they splashed down in the Pacific July 24, 1969, after a historic mission in which man first set foot on the moon. The HORNET again served as primary recovery ship, with communications ship USS ARLINGTON, guided missile destroyer USS GOLDSBOROUGH and destroyer USS CARPENTER assisting.

TF-130 began its lunar mission splashdown responsibilities when it recovered astronauts Frank Borman, James Lovell Jr. and William Anders of Apollo 8, the first actual lunar mission of the Apollo program. The carrier USS YORKTOWN was primary recovery ship for the splashdown on Dec. 27, 1968. The force again deployed for a lunar mission--Apollo 10-- on May 26, 1969 when it recovered astronauts Thomas Stafford, Eugene Cernan and John Young.

Under the command of Rear Admiral Henry S. Morgan Jr., Commander Hawaiian Sea Frontier, TF-130's area of responsibility covers the entire Pacific Ocean from the west coast of the United States to the middle of the Indian Ocean. Captain Robert Tolleson acts as Manned Spacecraft Recovery Officer in the command, while Air Force Colonel Frederick V. Sohle Jr., is the Air Force advisor.

Captain Robert T. Tolleson
Recovery Officer
Task Force 130

Captain Robert T. Tolleson was born in
e attended Phoenix Junior College and the University of
Arizona before commencing Navy flight training in June 1941, at the
Naval Air Station, Jacksonville, Florida.

In March 1942, he completed flight training and was commissioned
an Ensign in the Naval Reserve. He served as a flight instructor at
the Naval Air Station, Jacksonville, and Naval Air Station, Miami,
until November 1943, when he was assigned as material and gunnery
officer with Patrol Squadron 125.

Following further flight instruction he served with Fleet Air
Wings ONE and EIGHTEEN until January 1948. He then served a six
months tour at the Naval Air Facility, Litchfield Park, Arizona.
He became executive officer of the Naval Air Station, El Centro,
California, in June 1948, after which he attended General Line School
in Monterey, California.

In 1961, Captain Tolleson became the representative of the Chief
of Naval Operations for support of manned spaceflight operations,
involved in Project Mercury. He took command of the U.S. Navy
Astronautics Group at Point Mugu, California until August 1964, when
he was assigned Recovery Officer for Commander Task Force 130. During
his tenure in Hawaii, he has taken part in all Gemini and Apollo
missions, including eight manned recoveries in the Pacific, the
most recent being Apollo 15.

Captain Tolleson has been awarded the Navy Commendation Medal,
the NASA Exceptional Service Medal and the Navy Meritorious Unit
Commendation for his role in Manned Spacecraft Recovery. For his
participation in the flawless Apollo 11 recovery he received the
Legion of Merit.

CAPTAIN EDWARD A. BOYD
COMMANDING OFFICER
USS TICONDEROGA (CVS-14)

Captain Edward Avres Boyd was born

He received a Bachelor of Arts degree from Augustana College and did graduate work in Meteorology at the Massachusetts Institute of Technology and New York University. He entered the Navy as an Ensign in Washington, D.C. on July 3, 1944 and served as an Aerological Officer in the Southwest Pacific with advance base units in the Philippines, Japan and Truk Island, Central Carolines.

After World War II he attended Lighter-than-Air flight training in Lakehurst, N.J. and was designated a Naval Aviator in April 1947. Lt Boyd then served in Airship Squadron One out of Santa Ana, Calif. and Weeksville, N.C. He was Assistant Engineering Officer, O and R Department, Lakehurst, N.J. until he entered the Heavier-than-Air flight training in 1951. Upon completion of HTA curriculum he was assigned to Patrol Squadron 26 at Brunswick, Me. in December 1952. In 1954, LCdr Boyd completed the Naval Aviation Safety Engineering course at the University of Southern California and was assigned to the Staff of Commander Fleet Air Wings Atlantic as Aviation Safety Officer. He attended Line School in Monterey, Calif. from January 1957 to November 1957, at which time he was ordered to the Office of Legislative Affairs in Washington, D. C. He served as Naval Liaison Officer to the Appropriations Committee, House of Representatives until July 1960. Cdr Boyd served as Executive Officer of VS-24 in Norfolk, Va. and as commanding officer of VS-20, Quonset Point, R.I. from October 1961 until September 1962.

Commander Boyd joined the USS YORKTOWN as Air Operations Officer in October 1962 and became the Air Officer in April 1963. Detached from the "Fighting Lady" in 1964, Commander Boyd assumed command of Carrier Anti-submarine Air Group 55 in October 1964, the first ASW Air Group to be utilized in the Vietnam Conflict.

Captain Boyd was ordered to the Office of DCNO for Research and Development in November 1965 where he served for three years as Head of Air Undersea Warfare Development. As additional duties he was National Leader, TRI Partite Airborne Systems Panel, Sub-Group G, U. S. Member Information Exchange Group II, NATO and Deputy Liaison Officer, President's Scientific Advisory Committee for Naval Warfare.

Capt Boyd took command of USS TALUGA (AO-62) on Dec. 23, 1968. Following two deployments to WestPac where the "Flying Red Horse" won the Navy "E" for operational excellence, he was ordered to Commander Naval Base, Los Angeles-Long Beach as Chief of Staff on June 15, 1970. On Dec. 14, 1970, Capt Boyd relieved Capt McLaughlin on board USS TICONDEROGA (CVS-14) as commanding officer.

Capt Boyd is married to the former Ann Rixey of Quantico, Va. They have three children, Michele, Ayres, and Brent. They reside in Coronado, Calif.

USS TICONDEROGA (CVS-14)

Aircraft carrier USS TICONDEROGA (CVS-14) is the third ship to be so named. She is the tenth Essex Class carrier built. Her keel was laid Feb. 1, 1943 in Newport News, Va., and she was first commissioned on May 8, 1944.

TICONDEROGA steamed into the Pacific Theater of World War II and for three months was active in the destruction of Japanese ships and airfields in and around the Philippines. Then on Jan. 21, 1945, in the South China Sea, while enroute to hit Formosa, TICONDEROGA was attacked by a suicide plane. The kamikaze crashed into the ship's flight deck abreast of her No. 2 five-inch gun mount and the bomb it carried exploded just above the hangar deck, setting fire to many planes as well as killing and wounding about 100 men. Though many were trapped and seriously burned in the gallery deck spaces, all the pilots were safely evacuated without casualties.

A second kamikaze struck the carrier from the starboard side near the island structure and started several fires. The second plane's bomb exploded just inboard of the island causing severe damage and killing some 100 men.

After two months of extensive repairs, TICONDEROGA went back in action for the remaining five months of the war. The fighting "T" ended her Pacific campaign of World War II with an array of awards. She received five Battle Stars for the Western Caroline Islands, Leyte, Luzon and Okinawa Gunto operations and for the Third Fleet Operations against Japan. She also won the Navy Occupation Medal and the Philippine Presidential Unit Badge.

In January 1947, she was placed in the Bremerton Group of Inactive Reserve Ships. Brought out of reserve in 1952, TICONDEROGA was placed in reduced commission for conversion that included steam-driven catapults to launch modern jet aircraft, a nylon barricade, a deck-edge elevator, a streamlined island, and the latest in electronic and fire control equipment.

After two years in the yards, she was recommissioned in 1954 and then participated in fleet exercises along the East Coast and in the Mediterranean. She entered the Norfolk Naval Shipyard in August 1956 for major conversion to her flight deck.

During the period 1960-1962 she made five peace-time cruises to the Far East. Then, in August 1964, during her sixth deployment she sent air support to destroyers USS MADDIX and USS C. TURNER JOY which were under attack by torpedo boats in the Gulf of Tonkin. Shortly afterwards, she and other Navy carriers began the first strikes against bases in North Vietnam. Because of her fast action, she was awarded the Navy Unit Commendation.

She again deployed to the Western Pacific in September 1965 and from October 1966 until May 1967. She won her second Navy Unit Commendation for the high performance of her crew under combat conditions.

Following another period of yard work and refresher training, TICONDEROGA again deployed for the Far East in December 1967. She made more than 16,500 launches with her catapults in 120 days of action. On two days she launched more than 170 aircraft, with a record of 175. Once she hurled 20 A-4 attack jets from her deck in under eight minutes.

Pilots of the air wing dropped 9,600 tons of ordnance which topped the previous deployment by 300 tons. The bombs destroyed or damaged 119 bridges, 118 truck parks, 424 barges, 28 radar sites, and many other targets. For this deployment she was awarded her third Navy Unit Commendation.

On Feb. 1, 1969, TICONDEROGA left San Diego for her tenth Western Pacific deployment. She celebrated her 25th birthday on May 8th while in Subic Bay, Republic of the Philippines. Upon her return to the United States, she was awarded the Meritorious Unit Commendation.

In October 1969 her homeport was changed to Long Beach and she was designated an anti-submarine warfare (ASW) carrier. Upon arrival at Long Beach, TICONDEROGA entered the naval shipyard and began an eight month yard period for regular overhaul and conversion.

In July 1970, she was moved back to San Diego and then began underway and refresher training in preparation for still another WestPac cruise for 1971.

In March 1971, she began a four-month deployment which would take her to the Indian Ocean, Tonkin Gulf, Philippine Sea and Sea of Japan to test anti-submarine warfare equipment and techniques. In the Sea of Japan, she participated in anti-submarine exercises with the Japanese Maritime Defense Force, then returned to San Diego in early July.

USS HASSAYAMPA (AO-145)

USS HASSAYAMPA will be making her fifth appearance as a logistics ship in support of the manned flight recovery program. She was the logistics ship for Gemini 8 (March 1966), Gemini 9 (June 1966), Apollo 11 (July 1969), and Apollo 12 (November 1969).

HASSAYAMPA is the third of a class of six large fleet oilers commissioned by the Navy. She was built by the New York Shipbuilding Corp., Camden, N.J. and was launched in September 1954. She was commissioned at the Philadelphia Naval Shipyard in April 1955.

The "Hass" has completed over 3,000 replenishments at sea, in addition to having delivered over 1 1/2 million pounds of mail to U. S. servicemen afloat. Since her commissioning, the HASSAYAMPA has operated throughout the Pacific Ocean and the Indian Ocean.

HASSAYAMPA is attached to Service Squadron FIVE of the FIRST Fleet and is homeported in Pearl Harbor, Hi.

As a fleet oiler, the HASSAYAMPA provides vital at-sea logistics support for the major task groups of the Pacific Fleet. She has supported the Seventh Fleet during many critical periods, such as the Nationalist Chinese transport convoy movement during the Quemoy-Matsu crisis of 1958; the transportation of Marines into Thailand in 1962; and the Tonkin Gulf crisis in 1964.

HASSAYAMPA has a liquid cargo capacity of 130,582 barrels of Navy standard fuel oil; 45,069 barrels of JP-5 (kerosene-type fuel); and 10,842 barrels of aviation gasoline. In 1970, HASSAYAMPA became the first Service Force ship to burn Navy distillate fuel, a cleaner burning fuel than the standard fuel oil.

CAPTAIN ORVILLE W. MCGUIRE
COMMANDING OFFICER
USS HASSAYAMPA (AO-145)

Captain Orville W. McGuire assumed command of HASSAYAMPA in April 1972.

Capt McGuire, a graduate of Central Missouri State College, attended Navy Officer Candidate School, Newport, R.I. and was commissioned Ensign in March 1953. He was designated a Naval aviation observer (since changed to Naval Flight Officer) in March 1954.

Capt McGuire's prior assignments include Heavy Attack Squadrons SEVEN and NINE; Reconnaissance Attack Squadron SIX; staff, Commander Reconnaissance Attack Wing One; commanding officer of Training Squadron TEN; navigator of USS JOHN F. KENNEDY (CVA-67); Naval Air Systems Command Headquarters; and Naval Material Command Headquarters.

Captain McGuire is also a graduate of Naval Postgraduate School, Monterey, Calif., the University of Minnesota and the Armed Forces Staff College.

He is authorized to wear the Distinguished Flying Cross with one bronze star; the Air Medal; the Navy Commendation Medal with Combat "V" and the Navy Unit Commendation Medal.

Captain McGuire and his wife,
are the parents of two daughters and one son.

USS CARPENTER (DD-825)

As secondary recovery unit for Apollo 16, CARPENTER is participating in her sixth recovery deployment. She was the secondary recovery ship for Apollo 4 (November 1967), Apollo 6 (March 1968), Apollo 10 (May 1969), Apollo 11 (July 1969), and Apollo 14 (February 1971).

USS CARPENTER is named for Lieutenant Commander Donald M. Carpenter, a prominent figure in the early days of naval aviation.

CARPENTER was launched at the Orange, Tex. shipyard in December 1949. Three months later, she was assigned to the Pacific Fleet as a unit of the Navy anti-submarine warfare force and homeported in Pearl Harbor, Hawaii.

CARPENTER underwent an extensive rehabilitation and modernization conversion (FRAM I) at Pearl Harbor Naval Shipyard from May 1964 to June 1965. She was rebuilt from the main deck up with a new aluminum superstructure and equipped with the latest anti-submarine warfare armament.

CARPENTER has deployed five times to the Western Pacific for duty off Vietnam. These cruises required many of her capabilities, including search and rescue, inflight refueling of helicopters, plane guarding, and anti-submarine warfare screening for aircraft carriers.

CARPENTER, a unit of Destroyer Flotilla FIVE and Destroyer Squadron ELEVEN, was awarded the Battle Efficiency "E" for outstanding overall performance in 1962-63, 1967-68, and 1968-69. She recently received the gold "E" for gunnery excellence for five consecutive years. She also holds six campaign stars.

CARPENTER's motto, "Luku Mokoluu", which is Hawaiian for "killer of undersea boats," appears in the ship's insignia of a Hawaiian Warrior superimposed on the red, white, and blue of the Hawaiian and American flags.

COMMANDER CORNELIUS T. O'NEILL
COMMANDING OFFICER
USS CARPENTER (DD-825)

Commander Cornelius O'Neill assumed command of CARPENTER in December 1971, following duty as executive officer of destroyer escort USS RATHBURNE (DE-1057).

After graduating from St. John's University in 1958, Commander O'Neill attended Officer Candidate School and was commissioned Ensign in the U. S. Naval Reserve.

Cdr O'Neill's first sea assignment was as combat information center officer on fleet oiler USS ELOKOMIN (AO-55) where he subsequently became her operations officer and navigator.

He was assigned as operations officer and navigator on board destroyer USS ZELLARS (DD-777) during the Cuban Quarantine Operation in October 1962. During this assignment, he was selected into the regular Navy.

In June 1963, he was reassigned to the Bureau of Naval Personnel in Washington, D.C. where he was a detailee in the Junior Surface Officer Assignment section.

After two years with the Bureau, he assumed command of ocean-going minesweeper USS PRIME (MSO-466). Under his command, the PRIME was awarded the Navy Unit Commendation and the Meritorious Unit Commendation for her anti-infiltration patrol activities off the coast of Vietnam.

Cdr O'Neill next served as aide and flag lieutenant to Vice Admiral Lloyd M. Mustin, Director, Defense Atomic Support Agency in Washington, D.C.

Cdr O'Neill is married to the former Margaret Mathwin of Brooklyn, N.Y. They have three children, Cornelius, Margaret and Maura.

COMMANDER A. K. FIESER
OFFICER-IN-CHARGE
HELICOPTER COMBAT SUPPORT SQUADRON ONE (APOLLO DETACHMENT)

Commander Fieser reported to Helicopter Combat Support Squadron ONE (HC-1) in March 1971 to assume duties as the executive officer. He was also appointed as the officer-in-charge of HC-1's Apollo detachment.

He received a Bachelor's degree in mechanical engineering from the University of Illinois in 1954. He attended Navy Officer Candidate School and was commissioned Ensign in July 1955.

After a tour of duty on the staff of Commander Amphibious Squadron THREE in San Diego, he received helicopter flight training at Pensacola, Fla., and earned his "wings" in July 1958. His first fleet air assignment was to Helicopter Anti-submarine Squadron SIX, based at Imperial Beach, Calif.

In July 1961, Cdr Fieser commenced postgraduate training in aeronautical engineering at the Navy Postgraduate School, Monterey, Calif. After two years there, he was transferred to the Massachusetts Institute of Technology where he received a Master of Science and an Engineer of Aeronautics and Astronautics degree in September 1964.

Cdr Fieser was assigned to Helicopter Anti-submarine Squadron THREE, based at Norfolk, Va. During this tour, he participated in the recovery of Gemini 10.

He joined the analysis division of the staff of Commander Anti-submarine Forces, Atlantic Fleet in April 1967. After serving 11 months there, he was reassigned to Training Squadron ONE at Saufley Field, Pensacola, Fla. where he became the flight leader of Flight Twelve.

In August 1969, Cdr Fieser attended the Naval War College at Newport, R.I. for the Command and Staff course. After completion of the course, he was assigned to Helicopter Anti-submarine Squadron TEN as the executive officer.

Commander Fieser and his wife,
with their three children Burt, Diane and Valerie.

HELICOPTER COMBAT SUPPORT SQUADRON ONE

Apollo 16 marks the second appearance of HC-1 in spacecraft recovery activity. The assignment is well-directed. Since 1948, the "Angels" of HC-1 have successfully accomplished the rescue of over 1,420 military and civilian personnel utilizing the UH-2C "Seasprite" and the SH-3G "Sea King."

The squadron was commissioned in 1948 as the Navy's first operational helicopter squadron and until 1967 was the largest and most active squadron of its type in the Navy. Its detachments provided helicopter services for every major ship in the Pacific Fleet, from Antarctic-bound ice breakers to modern attack carriers on patrol in the China Sea. Its responsibilities were extended over an area encompassing nearly 50 million square miles.

During the Korean Conflict, HC-1 pilots and crewmen were among the first into combat and pioneered new techniques of personnel rescue from behind enemy lines. HC-1 was awarded the Presidential Unit Citation and one of its pilots was decorated with the nation's highest award, the Medal of Honor.

Since April 1967, HC-1 has been divided into five different squadrons. From HC-1's assets were commissioned Helicopter Attack (Light) Squadron THREE (gunships), Helicopter Combat Support Squadron THREE (gunships), Helicopter Combat Support Squadron THREE (vertical replenishment), Helicopter Combat Support Squadron FIVE (training), and Helicopter Combat Support Squadron SEVEN (logistic support and combat search and rescue).

Staffed by 100 officers and 428 enlisted men, the squadron is based at Naval Air Station, Imperial Beach, Calif.

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.

LIEUTENANT EARL KUNIO KISHIDA
UDT-12 Apollo Recovery Team

Lieutenant Earl K. Kishida, 25, is the son of . After attending Lakes High School, Tacoma, Wash., where he lettered in tennis and wrestling, Lt Kishida attended Yale University, New Haven, Conn., where he affiliated with Zeta Psi Fraternity and received a Bachelor of Science degree in Administrative Sciences in 1968.

Prior to his assignment to Basic Underwater Demolition/SEAL Training in April 1970, Lt Kishida attended the Damage Control Assistant School at Treasure Island, San Francisco, and served as Electrical Officer and Damage Control Assistant of USS ROGERS (DD-876) during a Western Pacific deployment.

Lt Kishida completed Basic Underwater Demolition/SEAL training in September 1970 and was assigned to UDT-12. He has attended the Army Airborne School, Fort Benning, Ga.

In February 1971, Lt Kishida acted as Assistant Officer-in-Charge for UDT operations for Project Reindeer at Diego Garcia in the Indian Ocean. He was Officer-in-Charge of UDT Detachment Golf, ISB Nam Can (Solid Anchor) in May 1971, in addition to his regular duties as Diving Officer for UDT Twelve.

Lt Kishida has earned the following awards:

Combat Action Ribbon
Meritorious Unit Citation
National Defense Medal
Armed Forces Expeditionary Medal
Vietnamese Service Medal
Vietnamese Campaign Medal
Expert Pistol Medal

LIEUTENANT (JUNIOR GRADE) LARRY E. METZLER
UDT-12 Apollo Recovery Team

Ltjg Larry E. Metzler, 26, joined Underwater Demolition Team Twelve in October 1970. Prior to his commissioning from Officer Candidate School, Newport, R.I., he was a member of SEAL Team One, Coronado, Calif.

Ltjg Metzler served as detachment Officer-in-Charge of UDT Detachment Golf, ISB Nam Can, Republic of Vietnam in the summer of 1971 and as Officer-in-Charge of a UDT Amphibious Ready Group in the fall of 1971.

He is the son of Mr. and Mrs. Lawrence C. Metzler, 365 Clipper Way, Seal Beach, Calif., and was graduated from Western High School, Anaheim, Calif., where he lettered in swimming and water polo. He graduated from the University of Southern California in 1967 and holds a Bachelor of Science degree in Finance.

Ltjg Metzler is a member of the National Ski Patrol. He resides at 412 9th St., Coronado.

Ltjg Metzler has earned the following awards:

Combat Action Ribbon
Vietnamese Service Medal
Vietnamese Campaign Medal
National Defense Medal
Expert Pistol Medal

WARRANT OFFICER ONE GERALD T. HAMMERLE
UDT-12 Apollo Recovery Team

Warrant Officer Gerald T. Hammerle, is a 13-year veteran of Underwater Demolition and SEAL teams. He served two six-month tours in the Republic of Vietnam while stationed at SEAL Team Two, Little Creek, Va.

He is a native of Tarrytown, N.Y.;
He has attended Southwestern Junior College, Chula Vista, Calif.

Warrant Officer Hammerle is a graduate of Army Airborne School, Ft Benning, Ga., Explosive Ordnance Disposal School, Indian Head, Md.; and Gunner's Mate Technician School, Albuquerque, N.M.

He holds two Bronze Stars, with Combat "V", Navy Commendation Medal with Combat "V", Purple Heart, Combat Action Ribbon, Presidential Unit Citation, National Defense Medal, Vietnamese Service Medal, Vietnam Campaign Medal and Vietnamese Cross of Gallantry.

He is married to the former

CHIEF ENGINEMAN GARY ALLAN PHELPS
UDT-12 Apollo Recovery Team

Chief Engineman Gary Allan Phelps, has been a member of UDT-12 Coronado, Calif., for the past nine and one-half years. During his deployments to the Western Pacific, he has served with various UDT detachments in Vietnam in 1965-66, 1967-68, 1969-70, and 1971.

He has attended Humboldt State College, Arcata, Calif., and is a graduate of the Army Airborne School, Ft Benning, Ga. Additionally he has attended the Navy Air Conditioning and Refrigeration School and Hand-to-Hand Combat School where he was class honorman.

He presently resides

Chief Phelps has earned the following awards:

- Navy Commendation Medal with Combat "V"
- Navy Achievement Medal
- Combat Action Ribbon
- National Defense Medal
- Presidential Unit Citation
- Navy Unit Commendation
- Vietnamese Cross of Gallantry
- Vietnamese Campaign Medal
- Vietnamese Service Medal

RADIOMAN FIRST CLASS CHARLES H. MCGEE, JR.
UDT-12 Apollo Recovery Team

Radioman First Class Charles H. McGee, Jr., entered the Navy in 1965 and completed UDT training in 1967. As a member of UDT-12, he has served in detachments to the Republic of South Vietnam in 1967-1968, 1970 and 1971.

He is the son of

After completing UDT training in 1967, McGee attended Army Airborne School, Ft Benning, Ga., and the Explosive Ordnance Disposal School, Indian Head, Md., where he was class honor man. Additionally, McGee attended the Army High Altitude Low Opening parachuting school.

McGee has earned the following awards:

Navy Commendation Medal with Combat "V"
Combat Action Ribbon
Presidential Unit Citation
Meritorious Unit Citation
Navy Unit Commendation
Vietnamese Cross of Gallantry
Good Conduct Medal (1)
Vietnam Service Medal
Vietnam Campaign Medal
National Defense Medal
Expert Pistol Medal

ELECTRONIC TECHNICIAN (RADIO) THIRD CLASS MICHAEL H. GOTCHEY
UDT-12 Apollo Recovery Team

Electronic Technician (Radio) Third Class Michael H. Gotchev.

He was graduated from J. F. Kennedy High School, Denver, in 1968.

Since his enlistment in the Navy in September 1969, Gotchey has attended Basic Electricity and Electronics School and Electronic Technician School at Treasure Island, San Francisco, Calif. Gotchey was then assigned to Basic Underwater Demolition/SEAL training, which he completed in November 1970 and was subsequently assigned to UDT-12.

Since his assignment to UDT-12, Gotchey has attended the Army Airborne School, Ft Benning, Ga., and has made a Western Pacific deployment, during which he served with an amphibious ready group and participated in a 10-day exercise with the Philippine Underwater Operation Unit in the Southern Philippine Islands, which involved channel blasting and beach clearing to aid the local populace.

Gotchey has earned the following awards:

National Defense Medal
Vietnamese Service Medal
Expert Pistol Medal

PHOTOGRAPHER'S MATE THIRD CLASS ROBERT GERALD HAY
UDT-12 Apollo Recovery Team

Photographer's Mate Third Class Robert Gerald Hay. is the
son of

Hay joined UDT-12, Coronado, Calif., in June 1970
after a tour on board aircraft carrier USS BENNINGTON.

After attending Palisades High School, Pacific Palisades, Calif.,
where he lettered in swimming, Hay attended Orange Coast College, Costa
Mesa, where he again lettered in swimming and water polo and majored
in Life Sciences.

Hay served with a UDT detachment at ISB Nam Can, Republic of Vietnam,
in May 1971 and also saw service in a UDT detachment with an amphibious
ready group. He is a graduate of the Army Airborne School, Ft Benning,
Ga.

Hay has earned the following awards:

National Defense Medal
Combat Action Ribbon
Vietnamese Service Medal
Vietnamese Campaign Medal

AVIATION ORDNANCEMAN THIRD CLASS GREGORY ALAN PLATT
UDT-12 Apollo Recovery Team

Aviation Ordnanceman Third Class Gregory Alan Platt,
was graduated from Basic Underwater Demolition/SEAL
training on Nov. 6, 1970. He was born in Springfield, Minn. He is the
son of _____ and is a 1969
graduate of Lincoln High School.

Petty Officer Platt is a member of UDT-12, Coronado, Calif. He
recently completed a nine-month deployment to the Western Pacific with
UDT-12. During this deployment, he participated in a 10-day exercise
with the Philippine Underwater Operation Unit in the Southern Philippine
Islands, which involved channel-blasting and beach-clearing to aid the
local populace.

In addition to his underwater demolition training, Platt has also
attended aviation ordnancemen school in Jacksonville, Fla., and was
graduated from Army Airborne School in Ft Benning, Ga.

Platt has earned the following medals:

National Defense Medal
Vietnamese Service Medal
Expert Pistol Medal

PERSONNELMAN THIRD CLASS WILLIAM E. RANGER
UDT-12 Apollo Recovery Team

Personnelman Third Class William E. Ranger.

He was graduated from the Canterbury School, New Milford, Conn., where he lettered in track and swimming.

Ranger attended Georgetown University, Washington, D.C., prior to entering the Navy in March 1969. Ranger attended Personnelman "A" School at Bainbridge, Md., and was subsequently assigned to USS SARATOGA for eight months.

After his short tour on board SARATOGA, Ranger was assigned to Basic Underwater Demolition/SEAL training at Coronado, Calif., which he completed in November 1970. He was then assigned to UDT-12 and has attended the Army Basic Airborne School, Ft Benning, Ga., and has made a Western Pacific deployment during which he served with two amphibious ready groups and at ISB Nam Can, Republic of Vietnam.

Ranger has earned the following awards:

Combat Action Ribbon
National Defense Medal
Vietnamese Service Medal
Vietnamese Campaign Medal

SHIPFITTER THIRD CLASS PAUL A. SPARK
UDT-12 Apollo Recovery Team

Shipfitter Third Class Paul A. Spark, a citizen of the United Kingdom, completed Basic Underwater Demolition/SEAL training in November 1970, and was assigned to Underwater Demolition Team Twelve, Coronado, Calif.

Spark was born in London, England and emigrated to the United States in 1957 with his parents,

He is a graduate of North Hills High School in Pittsburgh.

Spark deployed to the Western Pacific with UDT-12 in 1971. He is a graduate of the Army Airborne School, Ft Benning, Ga.

He has earned the following medals:

National Defense Medal
Vietnamese Service Medal

DAMAGE CONTROLMAN THIRD CLASS WILLIAM C. VALOIS
UDT-12 Apollo Recovery Team

Damage Controlman Third Class William C. Valois.

After graduating from Westchester High School, Los Angeles in 1969, Valois enlisted in the Navy and attended Electronics Technician School at Treasure Island, San Francisco, Calif., prior to his assignment to Basic Underwater Demolition/SEAL training at Coronado, Calif. After completion of training in November 1970, Valois was assigned to UDT-12 and attended Army Airborne School at Ft Benning, Ga.

Serving with UDT-12, Valois has completed one deployment to the Western Pacific, during which he participated in the UDT operation for Project Reindeer at Diego Garcia and has assisted in shark research at Subic Bay, Republic of the Philippines.

Valois and his wife, the former Miss Connie Rogers, reside in Imperial Beach, Calif.

Valois has earned the following awards:

National Defense Medal
Expert Pistol Medal

SEAMAN JAMES J. PETRELLA
UDT-12 Apollo Recovery Team

Seaman James J. Petrella.

After graduating from Mingo High School, where he lettered in football, track, and basketball, Seaman Petrella attended West Liberty State College, West Liberty, W. Va., where he received a degree in Metallurgical Engineering in 1970.

Petrella enlisted in the Navy in September 1970 and completed Basic Underwater Demolition/SEAL training at Coronado, Calif., in June 1971. Upon completion of training, Petrella was assigned to UDT-12 and has attended the Army Airborne School, Ft Benning, Ga.

Seaman Petrella has earned the following awards:

National Defense Medal
Expert Pistol Medal

BLANK

Brigadier General Frank K. Everest, Jr.
Commander
Aerospace Rescue and Recovery Service

Brigadier General Frank K. Everest, Jr., is Commander of the Aerospace Rescue and Recovery Service with headquarters at Scott Air Force Base, Ill. He is responsible to the Commander of Military Airlift Command for maintaining a highly-trained and professional rescue force, ready at all times to go to the aid of military crews and other persons in distress.

General Everest was born in [redacted]. After graduating from high school in 1937, he attended Fairmont State College for one year. He later studied engineering at West Virginia University to prepare for a flying career.

He entered Army Air Force pilot training in November 1941, was graduated and received a commission in July 1942. After P-40 training, he was sent to North Africa and flew 94 combat missions in Africa, Sicily, and Italy. During this tour, he shot down two German aircraft and damaged another. Then he was assigned to a fighter squadron at Venice, Fla., as an instructor. He asked for combat duty again and was assigned to the China-Burma-India Theater.

The General commanded the 17th Fighter Squadron of the 5th Fighter Group, Chihkiang, China, flying an additional 67 combat missions. When his plane was shot down by ground fire in May 1945, he was captured and remained a Japanese prisoner until the end of hostilities. Prior to being shot down he had destroyed four Japanese aircraft.

Following a rest leave, General Everest was assigned to the Flight Test Division at Wright Field, Ohio as a test pilot. He took part in many experimental tests of the Bell X-1, and established an unofficial world altitude record of 73,000 feet.

In September 1951, he was transferred to the new Air Force Flight Test Center at Edwards Air Force Base, Calif., and became the chief Air Force test pilot as head of the Flight Test Operations Division. During his stay at Edwards, General Everest tested the X-1, 2, 3, 4, and 5; XF-92; and YB-52. He also took part in test programs for the F-100, 101, 102, 104, and 105; the B-52, 57 and 66. On October 29, 1953, he established a world speed record of 755.149 m.p.h. in a North American YF-100.

In December 1954, General Everest test-flew the Bell X-1B to a speed of Mach 2.3 (2.3 times the speed of sound), making him the second fastest man in the world. Later flights in the Bell X-2 rocket plane established him as "the fastest man alive" when he attained a new unofficial speed record of 1,957 m.p.h. or Mach 2.9.

He was transferred to Hahn Air Base, Germany, in 1957, serving as Commander of the 461st Fighter (Day) Squadron of the 36th Fighter Wing. From Germany he was assigned to North Africa, as a Group Commander and later became Deputy for operations at Wheelus Air Base, Libya. Upon return to the United States he became Director of Operations, 401st Tactical Fighter Wing, England Air Force Base, La.

General Everest next commanded the 4453rd Combat Crew Training Wing at MacDill Air Force Base, Fla., and in June 1964 he transferred with the unit to Davis-Monthan Air Force Base, Ariz. In May 1965, he was transferred to Nellis Air Force Base, Nev., to become Commander of the 4520th Combat Crew Training Wing.

He also served as Director of Aerospace Safety and later as the Assistant Director for Operational Test and Evaluation for Defense Research and Engineering, Office of the Secretary of Defense, before becoming ARRS commander.

A Command Pilot with more than 9,000 flying hours, the General is also a graduate of the Army parachutist school at Ft. Benning, Ga.

Among his decorations are the Legion of Merit with one Oak Leaf Cluster; Distinguished Flying Cross with two Oak Leaf Clusters; Air Medal with seven Oak Leaf Clusters; Air Force Commendation Medal with one Oak Leaf Cluster; Purple Heart; and the Chinese Aviation Award.

In addition to these and other military honors, General Everest has been recognized repeatedly for his contributions to aerospace progress. He was chosen as one of 1955's "Ten Outstanding Young Men" by the U. S. Chamber of Commerce. In 1956 the U.S. Chamber of Commerce named him one of the Nation's "Greatest Living Americans." A year later he was awarded both the Harmon trophy and the Octave Chanute trophy.

General Everest married the former Avis Mason of Fairmont, W. Va. They have three children: Victoria, Cynthia, and Frank III.

AEROSPACE RESCUE AND RECOVERY SERVICE

The Aerospace Rescue and Recovery Service (ARRS) is responsible to the Military Airlift Command (MAC) for locating and recovering downed airmen on a global basis, locating and assisting astronauts who land outside planned splashdown areas, directing the joint military aircraft hurricane evacuation plan and conducting the inland portion of the National Search and Rescue Plan.

ARRS personnel serving in Southeast Asia are among the most highly decorated members in the American armed services. Since December 1964, nearly 11,000 decorations have been awarded to ARRS personnel for duty in SEA. These decorations include one Medal of Honor, 27 Air Force Crosses, and over 300 Silver Stars.

Both overseas and in the United States, ARRS forces are assigned to Air Force bases in varying strength. Besides the headquarters at Scott AFB, Ill., ARRS has one Rescue and Recovery Group, four wings and 19 squadrons which provide rescue coverage for large areas the world over. One of the five ARRS Reserve squadrons, the 305th ARRSq, was called up in response to the Pueblo crisis in January 1968.

Small detachments are located at more than 70 bases to provide a variety of rescue activities, including local base rescue and combat aircrew recovery.

Within the United States, ARRS search, location and recovery (SAR) operations for all aircraft, civilian and military, are conducted under plans developed in cooperation with state and area officials.

In its 26-year history, ARRS has rescued more than 22,000 people while providing help for nearly 84,000 persons involved in accidents or incidents.

In all, 225,000 separate missions were involved, requiring more than a million flying hours. The missions ranged from escorting aircraft to locating lost hunters and hikers, boarding stricken ships at sea and helping in natural disasters such as earthquakes and floods.

ARRS continues to carry out its wartime role in Vietnam. From December 1964 to date, more than 3,300 American or allied personnel have been saved. Of these, more than 2,300 were rescued under combat conditions, where hostile fire was encountered. The rest were noncombatant saves, including many Vietnamese civilians.

One of ARRS' prime responsibilities is support of national space programs. Manned space flights in the Mercury and Gemini series have been widely supported by ARRS. In Project Apollo, ARRS forces have supported both manned and unmanned launches from Cape Kennedy and assisted in subsequent search, location and recovery operations downrange. Helicopters, and conventional aircraft provided launch area coverage, while farther downrange, other ARRS forces prepared for spacecraft landing, in either planned or unplanned areas.

Unmanned space operations also receive ARRS support. The Discoverer satellite series, the Titan and Saturn missile research programs and recovery of cassettes (instrument packages), capsules and reentry vehicles have been part of the command's mission. A new development in this field has been the perfection of the mid-air "snatch" recovery technique, whereby objects are recovered while descending on parachutes.

Pararescuemen, PJs for short, have played key roles in many rescues. PJs are qualified parachutists, SCUBA divers, mountain climbers, medical technicians and experts on survival. To train for these jobs, the PJ spends a full year in a variety of specialized military schools. The elite corps numbers fewer than 300 people, all qualified to wear the coveted maroon beret.

They have jumped into the sea to aid a man on a raft or secure a vital piece of space hardware. They have parachuted into trees, landed on mountains or in swamps to aid downed airmen or to help injured civilians.

Their varied qualifications have led PJs to perform not only in their combat roles, but also to make a contribution to the welfare of civilians. In their spare time in Vietnam, the PJs assist in local Medical Civic Action programs.

Besides treating the injuries and diseases of civilians, the PJs teach elementary sanitation and dietary courses and provide other information designed to assist the Vietnamese in caring for themselves.

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 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 because of the presence of the "Hercules".

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 parachute. 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 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 missions, PJs will be deployed around the world in selected locations. They will be aboard HC-130 aircraft and HH-3E and HH-53C helicopters--The ARRS aircraft which have made history in daring jungle rescues in Southeast Asia.

Three 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 by 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, drops the other two 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.

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SHIPS USED IN SPACE PROGRAM

MA-1	Atlantic		MR-3	Atlantic
	USS HaiTey (DD-556)			USS Lake Champlain (CVS-39)(PRS)
	USS Power (DD-839)			USS Decatur (DD-936)
	USS Vesole (DD-878)			USS Raleigh (DD-689)
	USS Manley (DD-940)			USS Rooks (DD-804)
	USS McCard (DD-822)			USS Abbot (DD-629)
	USS Casa Grande (LSD-13)			USS The Sullivans (DD-537)
	USS Escape (ARS-6)			USS Newman K. Perry (DDR-883)
MR-1A	USS Valley Forge (CVS-49)(PRS)			USS Recovery (ARS-43)
	USS Conway (DDE-507)			USS Ability (MSO-519)
	USS Cony (DD-508)			USS Notable (MSO-460)
	USS Waller (DDE-466)	MR-4		USS Randolph (CVS-15)(PRS)
	USS Eaton (DDE-510)			USS Cony (DDE-508)
	USS Bache (DDE-470)			USS Conway (DDE-507)
	USS Beale (DDE-471)			USS Stormes (DD-780)
	USS Murray (DDE-576)			USS Lowry (DD-770)
	USS Perry (DD-844)			USS Alacrity (MSO-520)
	USS Escape (ARS-6)			USS Exploit (MSO-440)
				USS Recovery (ARS-43)
MA-2	USS Donner (LSD-20)(PRS)			
	USS Greene (DDR-711)	MA-4		USS Plymouth Rock (LSD-29)(PRS)
	USS Bordelon (DDR-881)			USS Decatur (DD-936) (Recovered)
	USS Joseph P. Kennedy (DD-850)			USS Glennon (DD-840)
	USS Borie (DD-704)			USS Lind (DD-703)
	USS Opportune (ARS-41)			USS Borie (DD-704)
				USS Cony (DDE-508)
MR-2	USS Donner (LSD-20)(PRS)			USS Sarsfield (DDE-837)
	USS Manley (DD-940)			USS Zellars (DD-777)
	USS Ellison (DD-864)			USS Bigelow (DD-942)
	USS Cone (DD-866)			USS Escape (ARS-6)
	USS McCard (DD-822)			
	USS Warrington (DD-843)	MA-5		USS Lake Champlain (CVS-39)(PRS)
	USS Borie (DD-704)			USS Stormes (DD-780)(Recovered)
	USS Opportune (ARS-41)			USS Cone (DD-866)
				USS Chikaskia (AO-54)
MA-3	USS Greene (DDR-711)			USS Fiske (DDR-842)
	USS Gyatt (DDG-1)			USS Lowry (DD-770)
	USS Furse (DDR-882)			USS Laffey (DD-724)
	USS Basilone (DDE-824)			USS Hawkins (DD-873)
	USS Steinaker (DDR-863)			USS Witek (DDE-848)
	USS Joseph P. Kennedy (DD-850)			USS Perry (DD-844)
	USS Purdy (DD-734)			USS Compton (DD-705)
	USS Hyman (DD-732)			USS Bigelow (DD-942)
	USS Beatty (DD-756)			USS Blandy (DD-943)
	USS Bristol (DD-857)			USS Vogelgesang (DD-862)
	USS Donner (LSD-20)			USS John Willis (DE-1027)
	USS Chukawan (AO-100)			USS Fort Mandan (LSD-21)
	USS Recovery (ARS-43)			USS Hoist (ARS-40)
				USS Fidelity (MSO-443)

MA-6 Atlantic
USS Randolph (CVS-15)(PRS)
USS Noa (DD-841)(Recovered)
USS Stribling (DD-876)
USS Forrestal (CVA-59)
USS Norfolk (DL-1)
USS Chukawan (AO-100)
USS Blandy (DD-943)
USS C. S. Sperry (DD-697)
USS Barry (DD-933)
USS Kenneth D. Bailey (DDR-713)
USS Turner (DDR-834)
USS Goodrich (DDR-831)
USS Hugh Purvis (DD-709)
USS Glennon (DD-840)
USS Brownson (DD-868)
USS Cone (DD-866)
USS Stormes (DD-780)
USS Bearss (DD-654)
USS Witek (DDE-848)
USS Sarsfield (DDE-837)
USS Observer (MSO-461)
USS Exploit (MSO-440)
USS Recovery (ARS-43)

Pacific
USS Antietam (CVS-36)

MA-7 USS Intrepid (CVS-11)(PRS)
USS John R. Pierce (DD-753)(Recovered)
USS Robinson (DD-562)
USS Farragut (DLG-6)
USS Barton (DD-722)
USS Soley (DD-707)
USS English (DD-696)
USS Hank (DD-702)
USS Fred T. Berry (DDE-858)
USS Moale (DD-693)
USS Massey (DD-778)
USS Elokomin (AO-55)
USS Spiegel Grove (LSD-32)
USS Donner (LSD-20)
USS Dewey (DLG-14)
USS Swerve (MSO-495)
USS Sturdy (MSO-494)
USS Hoist (ARS-40)

USS Wren (DD-568)
USS Remey (DD-688)
USS Hunt (DD-674)

	ATLANTIC	PACIFIC
MA-8	USS Lake Champlain (CVS-39) USS John Paul Jones (DD-932) USS Barry (DD-933) USS Ingraham (DD-694) USS Haynesworth (DD-700) USS Hoist (ARS-40) USS Affray (MSO-511) USS Alacrity (MSO-520) USS Decatur (DD-936) USS Furse (DDR-882) USS C. F. Adams (DDG-2) USS Dyess (DDR-880) USS Bordelon (DDR-881) USS Kaskaskia (AO-27) USS Norris (DD-859) USS Sperry (DD-697) USS Willard Keith (DD-775)	USS Kearsarge (CVS-33)(PRS) USS Epperson (DD-719) USS Radford (DD-446) USS Walker (DD-517) USS Philip (DD-498) USS O'Bannon (DD-450)
MA-9	USS Wasp (CVS-18) USS Adroit (MSO-509) USS Stalwart (MSO 493) USS Opportune (ARS-41) USS Hyman (DD-732) USS Beatty (DD-756) USS M.C. Fox (DDR-829) USS Davis (DD-937) USS Compton (DD-705) USS Gainard (DD-706) USS Harwood (DD-861)	USS Kearsarge (CVS-33)(PRS) USS Thomason (DD-760) USS Taussig (DD-746) USS Fletcher (DD-445) USS Bold (DD-755) USS Epperson (DD-719) USS Lofberg (DD-759) USS Duncan (DDR-874) USS Dehaven (DD-724) USS Mansfield (DD-728) USS Chipola (AO-63) USS Kawishivi (AO-146) USS Knox (DDR-742)
GT-1	NONE	
GT-2	USS Lake Champlain (CVS-39)(PRS) USS Agile (MSO-421) USS Bulwark (MSO-425) USS Paiute (ATF-159) USS O'Hare (DD-889) USS Holder (DD-819) USS Vogelgesang (DD-862) USS Putnam (DD-757) USS Forrest Royal (DD-872) USS E. A. Greene (DD-711)	NONE

GT-3 ATLANTIC
USS Intrepid (CVS-11)(PRS)
USS Swerve (MSO-495)
USS Sturdy (MSO-494)
USS Nipmuc (ATG-157)
USS Sarsfield (DD-837)
USS R. A. Owens (DD-827)
USS Bigelow (DD-942)

USS D. H. Fox (DD-779)
USS R. L. Wilson (DD-847)
USS Boston (CAG-1)
USS Harwood (DD-861)
USS Kankakee (AO-39)
USS Rich (DD-820)
USS Cony (DD-508)
USS Ault (DD-698)
USS H. J. Ellison (DD-864)
USS John Paul Jones (DD-932)
USS Mullinnix (DD-944)
USS Vigilant (WPC-617)
USS Diligence (WPC-616)

GT-4 USS Wasp (CVS-18)(PRS)
USS Skill (MSO-471)
USS Nimble (MSO-459)
USS Hoist (ARS-40)
USS Hawkins (DD-873)
USS Barry (DD-933)
USS C. S. Sperry (DD-697)
USS Rich (DD-820)
USS Furse (DD-882)
USS Chukawan (AO-100)
USS Blandy (DD-943)
USS R. A. Owens (DD-827)

GT-5 USS Lake Champlain (CVS-39)(PRS)
USS Avenge (MSO-423)
USS Exultant (MSO-441)
USS Preserver (ARS-8)
USS Dupont (DD-941)
USS John W. Weeks (DD-701)
USS New (DD-818)
USS J. C. Owens (DD-776)
USS Neosho (AO-143)
USS Manley (DD-940)
USS Waldron (DD-699)

PACIFIC
NONE

USS Mason (DD-852)
USS Rupertus (DD-851)
USS Orleck (DD-886)
USS Higbee (DD-806)
USS Goldsborough (DDG-20)
USS Ponchatoula (AO-148)

USS Goldsborough (DDG-20)
USS Taylor (DD-468)
USS Mason (DD-852)
USS MacKenzie (DD-836)
USS Chipola (AO-63)

GT-6 ATLANTIC
USS WASP (CVS-18)(PRS)
SCRUBBED USS Paiute (ATF-159)
USS Fearless (MSO-442)
USS Fidelity (MSO-443)
USS Basilone (DD-824)
USS Ingram (DD-938)
USS Massey (DD-778)
USS Aucilla (AO-56)
USS Sticklell (DD-888)
USS Noa (DD-841)
USS R. E. Kraus (DD-849)

GT-7 USS Wasp (CVS-18)(PRS)
USS Ability (MSO-519)
USS Paiute (ATF-159)
USS Waldron (DD-699)
USS Kennedy (DD-850)
USS Aucilla (AO-56)
USS Meredith (DD-890)
USS Waccamaw (AO-109)
USS Power (DD-839)

GT-6A USS Wasp (CVS-18)(PRS)
USS Ability (MSO-519)
USS Paiute (ATF-159)
USS Power (DD-839)
USS Waldron (DD-699)
USS Kennedy (DD-850)
USS Aucilla (AO-56)
USS Meredith (DD-890)
USS Waccamaw (AO-109)

AS-201 USS Boxer (LPH-4)(PRS)
USS Kankakee (AO-39)
USS Salinan (ATF-161)
USS Fidelity (MSO-443)
USS Beale (DD-471)
USS Waller (DD-466)
USS Bordelon (DD-881)
USS Kaskaskia (AO-27)
USS Turner (DD-834)
USS Wilson (DD-897)
USS Ingram (DD-938)
USS Waldron (DD-699)

PACIFIC
USS Cochrane (DDG-21)
USS Renshaw (DD-499)
USS Rupertus (DD-851)
USS MacKenzie (DD-836)

USS Cochrane (DDG-21)
USS Renshaw (DD-499)
USS MacKenzie (DD-836)
USS Rupertus (DD-851)
USS Ponchatoula (AO-148)

USS Cochrane (DDG-21)
USS Renshaw (DD-499)
USS MacKenzie (DD-836)
USS Rupertus (DD-851)
USS Ponchatoula (AO-148)

NONE

GTA-8 ATLANTIC
USS Boxer (LPH-4) (PRS)
USS Fidelity (MSO-443)
USS Noa (DD-841)
USS Goodrich (DD-831)
USS C.P. Cecil (DD-835)
USS Caloosahatchee (AO-98)
USS M. C. Fox (DD-829)
USS Paiute (ATF-159)

GTA-9A USS Wasp (CVS-18)(PRS)
USS Papago (ATF-160)
USS Nimble (MSO-459)
USS McCaffery (DD-860)
USS Bordelon (DD-881)
USS Wilson (DD-847)
USS W. C. Lawe (DD-763)
USS Chikaskia (AO-54)
USS Opportune (ARS-41)
USS Sabine (AO-25)

GTA-10 USS Guadalcanal (LPH-7)(PRS)
USS Sumner (DD-692)
USS Norris (DD-859)
USS W. C. Lawe (DD-763)
USS Severn (AO-61)
USS Opportune (ARS-41)

AS-202 USS Opportune (ARS-41)
USS J. C. Owens (DD-776)
USS R. A. Owens (DD-827)
USS Salamonie (AO-26)
USS Chikaskia (AO-54)

GTA-11 USS Guam (LPH-9)(PRS)
USS Forrest Royal (DD-872)
USS Lind (DD-703)
USS McCaffery (DD-860)
USS Severn (AO-61)
USS Nipmuc (ATF-157)

TITAN IIIC/HST
USS LaSalle (LPD-3)(PRS)
USS Ft. Snelling (LSD-30)
USS Aucilla (AO-56)

PACIFIC
USS Leonard Mason (DD-852)
(Recovered)
USS Cochrane (DDG-21)
USS MacKenzie (DD-836)
USS Hassayampa (AO-145)

USS Epperson (DD-719)
USS Rupertus (DD-851)
USS MacKenzie (DD-836)
USS Hassayampa (AO-145)

USS Benjamin Stoddert (DDG-22)
USS DeHaven (DD-727)
USS Collett (DD-730)
USS Kawishiwi (AO-146)

USS Hornet (CVS-12)(PRS)
USS O'Bannon (DD-450)
USS Sproston (DD-577)
USS Benjamin Stoddert (DDG-22)

USS O'Brien (DD-450)
USS Mansfield (DD-728)
USS Chandler (DD-717)
USS Kawishiwi (AO-146)

NONE

	<u>ATLANTIC</u>	<u>PACIFIC</u>
GTA-12	USS Wasp (CVS-18)(PRS) USS C. H. Roan (DD-853) USS J. P. Kennedy (DD-850) USS Lloyd Thomas (DD-764) USS Canisteo (AO-99) USS Preserver (ARS-8) USS Kankakee (AO-39)	USS Joseph Strauss (DDG-16) USS Hollister (DD-788) USS Ozbourn (DD-846) USS Kawishiwi (AO-146)
AS-204	USS Essex (CVS-9)(PRS) USS Cony (DD-508) USS Dupont (DD-941) USS Kankakee (AO-39) USS Lorain County (LST-1177) USS Salinan (ATF-161)	USS Kawishiwi (AO-146) USS Philip (DD-498) USS Radford (DD-446)
APOLLO 4	USS Austin (LPD-4) USS Sabine (AO-25) USS J. P. Kennedy (DD-850) USS York County (LST-1175) USS Hoist (ARS-40)	USS Bennington (CVS-20)(PRS) USS Carpenter (DD-825)
APOLLO 5	USS Paiute (ATF-159)	NONE
APOLLO 6	USS Austin (LPD-4) USS Chikaskia (AO-54) USS York County (LST-1175) USS Dupont (DD-941) USS Opportune (ARS-41)	USS Okinawa (LPH-3)(PRS) USS Carpenter (DD-825)
APOLLO 7	USS Paiute (ATF-159) USS Essex (CVS-9)(PRS) USS Cambria (LPA-36) USS Arneb (LKA-56)	USS Cochrane (DDG-21) USS Nicholas (DD-449) USS Ponchatoula (AO-148) USS H. W. Tucker (DD-857) USS Rupertus (DD-851)
APOLLO 8	USS Salinan (ATF-161) USS Guadalcanal (LPH-7) USS Rankin (LKA-103) USS Chukawan (AO-100) USS Sandoval (LPA-194) USS Francis Marion (LPA-249)	USS Yorktown (CVS-10)(PRS) USS Cochrane (DDG-21) USS Arlington (AGMR-2) USS Nicholas (DD-449) USS Rupertus (DD-851) USS Chipola (AO-63)
APOLLO 9	USS Paiute (ATF-159) USS Guadalcanal (LPH-7)(PRS) USS Algol (LKA-54)	USS Nicholas (DD-449) USS Cochrane (DDG-21) USS Leonard F. Mason (DD-852)

ATLANTIC

APOLLO 10 USS Ozark (MCS-2)
USS Rich (DD-820)
USS Salinan (ATF-161)
USS Chilton (LPA-38)

APOLLO 11 USS New (DD-818)
USS Ozark (MCS-2)
USS Salinan (ATF-161)

APOLLO 12 USS Austin (LPD-4)
USS Hawkins (DD-873)
USS Escape (ARS-6)

APOLLO 13 USS New (DD-818)
USS Escape (ARS-6)
USS Bordelon (DD-881)
USS Forrest Royal (DD-872)
USS William C. Lawe (DD-763)

APOLLO 14 USS SPIEGEL GROVE (LSD-32)
USS HAWKINS (DD-873)
USS PAIUTE (ATF-159)

APOLLO 15 USS AUSTIN (LPD-4)
USS SALINAN (ATF-161)

PACIFIC

USS Princeton (LPH-5)(PRS)
USS Carpenter (DD-825)
USS Arlington (AGMR-2)

USS Hornet (CVS-12)(PRS)
USS Goldsborough (DDG-20)

USS Hornet (CVS-12)(PRS)
USS J. Strauss (DDG-16)

USS Iwo Jima (LPH-2)(PRS)
USS Benjamin Stoddert (DDG-22)
USS Kawishiwi (AO-146)
USS Granville S. Hall (YAG-40)

USS NEW ORLEANS (LPH-11)(PRS)
USS CARPENTER (DD-825)
USS PONCHATOULA (AO-148)

USS OKINAWA (LPH-3)
USS KAWISHIWI (AO-146)

GLOSSARY OF TERMS

SHIPS

- PRS Primary Recovery Ship
- SRS Secondary Recovery Ship
- LPH Helicopter Carrier designed as amphibious assault ship to support the Marine Corps vertical envelopment concept. Each carries an assault force of personnel, combat supplies, equipment and transport helicopters.
- AO Fleet Oiler. Used to refuel other ships at sea.
- ATF Fleet Ocean Tug. Heavy towing service with search and rescue as a secondary mission.
- LPD Amphibious Transport Dock. Designed to combine the functions of several amphibious ships -- the troop transport, attack cargo ship, helicopter carrier and dock landing ship. Can carry both combat troops and their heavy equipment to an enemy beach and land them by helicopter or pre-loaded landing craft.

AIRCRAFT

- COD Carrier Onboard Delivery. Provides delivery capability for personnel, film and data between aircraft/helicopter carriers and land bases, or carrier-to-carrier.
- ARRS AIRCRAFT Aerospace Rescue and Recovery Service HC-130H with long range electronic search and location capability. It carries pararescuemen swimmers for spacecraft collaring capability.
- ARIA EC-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-3D "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 ship.
- PHOTO HELICOPTER Carries NASA and Navy photographers, provides photographic documentation of recovery operations.
- SWIMMER HELICOPTER Recovery helicopter carrying UDT personnel who attach the sea anchor and flotation collar to command module.

MISCELLANEOUS

- SPLINTER SHIELD (PACIFIC) Reserved air space for events such as spacecraft landing and air support operations.
- HONEY BEE (ATLANTIC) Reserved air space for events such as spacecraft landing and air support operations.
- SARAH Search and Rescue Aircraft Homing. 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 signals 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 function is the airborne location of mission aircraft or spacecraft.
- 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 and assist astronauts upon splashdown.
- 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 action.
- RESCUE Voice call of USAF Air Rescue and Recovery Service (ARRS) aircraft of HC-130 type. Carry Pararescuemen who perform same functions as UDT swimmers.
- PRI-FLY Primary Aircraft Launch and Recovery Control Center. Located in island structure of aircraft/helicopter carriers 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.
- HF BEARING High frequency radio detection equipment in an aircraft or ship that indicates a compass direction from the aircraft to an emitting source (radio or radio transmitter) in another aircraft, ship or spacecraft.

CHOCK A wood or metal block placed on either side of an airplane's tire to prevent it from moving.

DOLLY The cradle on which the command module is placed once it is removed from the water after splashdown.

ISLAND The superstructure area, above the flight deck, on the starboard (right) side of an aircraft/helicopter carrier.

LAUNCH ABORT AREA The area in which the command module would land following an abort initiated during the launch phase of the flight, between approximately 90 seconds g.e.t. and earth parking orbit insertion.

SECONDARY LANDING AREAS Those areas in which the probability of a command module landing is sufficiently high to require at least secondary recovery ship support.

CONTINGENCY LANDING AREA The area in a band around the earth between 40 degrees North and 40 degrees South latitude that lies outside of the primary/secondary landing areas. Land based search and rescue aircraft support this landing situation.

PRIMARY LANDING AREA That area where the probability of landing is sufficiently high to warrant the requirement for primary recovery ship support.

MULE A towing tractor on an aircraft/helicopter carrier used to tow aircraft in the hangar bay and on the flight deck.

PJs Air Force Pararescuemen

B AND A CRANE Boat and Aircraft Crane. The primary Apollo command module crane used for retrieving the module from the water. For Apollo 13, 14 and again for Apollo 15, a special NASA furnished winch and nylon line will be installed piggy-back on the B and A crane for lifting the command module out of the water.

BILLY PUGH NET The rope cage in which the astronauts are lifted into the recovery helicopter from the life raft after getting out of the command module.

S BAND Primary communications and tracking frequency band.

SCRUB To cancel

TILLIE A smaller crane onboard the PRS used as a secondary or backup for the B and A crane.

UP/DOWN Navy jargon used to describe the working status of a piece of equipment. Up, meaning in working order, down the reverse.

