

WO-1-BURNER

CTF-130

COMMANDER

**MANNED SPACECRAFT
RECOVERY FORCE
PACIFIC**



**Commander Task Force 130
OPERATION ORDER 339-71**

**PROJECT APOLLO
APOLLO 15**

(Short Title: CHSF OPORD 339-71)

HEADQUARTERS
HAWAIIAN SEA FRONTIER
BOX 110
FPO San Francisco 96610

34:RTT
1905
11 May 1971

From: Commander Hawaiian Sea Frontier/Commander Manned Spacecraft Recovery Force, Pacific
(CTF 130)

To: Distribution List

Subj: Commander Hawaiian Sea Frontier Operation Order 339-71; promulgation of

Ref: (a) COMHAWSEAFRON OPLAN 305-67

1. Reference (a) provides an overall plan which describes project Apollo recovery operations in the Pacific Command area. COMHAWSEAFRON Operation Order number 339-71 amplifies and modifies reference (a) for use in the Apollo 15 mission.
2. This operation order is effective for planning and training upon receipt, and for execution without signal on 14 July 1971.
3. This operation order may be carried and used in aircraft. Authority is also granted to make extracts from this operation order as necessary.



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Distribution:
Annex X

Index

Basic Operation Order

- Annex A
 - Appendix
 - Appendix
 - Concept of Operations
 - I - Recovery Force Schedule of Events
 - II - Recovery Lines and Rescue Aircraft Locations
- Annex B
 - Apollo 15 Mission
- Annex C
 - Appendix
 - Tab
 - Tab
 - Planned Recovery Operations
 - I - Station Assignments
 - A - Mission Support Ship Station Assignments
 - B - Mission Support Aircraft Assignments
 - II - Support Positioning Illustrations
 - III - Access and Retrieval Times
 - IV - Post Retrieval Operations
- Annex D
 - Contingency Recovery Operations
- Annex E
 - Appendix
 - Tab
 - Tab
 - Tab
 - Tab
 - Tab
 - Communications
 - I - Recovery Communications Plan for Surface Recovery Forces
 - A - Command and Control Voice Circuits
 - B - NASA PRS Coordination Circuit
 - C - ATS Satellite Communications
 - D - Circuit ROMEO
 - E - Teletype Circuits
 - II - Recovery Communications Plan for the Land-based Air Search Group
 - A - SRCC Common Circuit HOTEL and Associated Circuits
 - III - Recovery Communications Plan in Support of a Contingency Landing
 - IV - Frequency Plan and Guard Assignments
 - V - Call Signs
 - VI - Astronaut Communications Recording
 - VII - Press Communications
 - A - Press Teletype Circuits
 - Annex G
 - Appendix
 - Appendix
 - Readiness and Training
 - I - Predeployment Underway Training
 - II - Training Communications Plan
 - Annex H
 - Medical
 - Annex M
 - Meteorology
 - Annex R
 - Reports
 - Annex X
 - Distribution

Record of Changes

1. As letter or message changes are issued to COMHAWSEAFRON Operation Order 339-71 they shall be recorded on this page and bound herein after changes have been made.

[illegible]

HEADQUARTERS
HAWAIIAN SEA FRONTIER
Box 110
FPO San Francisco 96610

WO-1 BORNER
CTF-130

34:RTT:
2699
13 July 1971

From: Commander Hawaiian Sea Frontier/Commander Manned Spacecraft Recovery Force, Pacific
(CTF 130)
To: Distribution List

Subj: Change ONE to Commander Hawaiian Sea Frontier Operation Order 339-71

Ref: (a) COMHAWSEAFRON ltr 34:RTT ser 1905 of 11 May 1971

Encl: New pages i, 1/2, A-1/A-2, A-I-1/A-I-2, A-I-3, A-II-1, B-1/B-2, C-I-A-1/C-I-A-2,
C-I-B-1/C-I-B-2, C-I-B-3/C-I-B-4, C-II-1/C-II-2, C-III-1, C-IV-1, E-I-1/
E-I-2, E-I-A-1, E-I-B-1, E-I-C-1, E-I-D-1, E-IV-1/E-IV-2, E-V-1/E-V-2, H-1.

1. This is Change ONE to Commander Hawaiian Sea Frontier Operation Order 339-71, promulgated by reference (a), and is effective upon receipt.

2. Make the following page changes in subject operation order (new pages from enclosure (1))

- a. Remove page i and insert new page i.
- b. Remove pages 1/2 and insert new pages 1/2.
- c. Remove pages A-1/A-2 and insert new pages A-1/A-2.
- d. Remove pages A-I-1/A-I-2 and insert new pages A-I-1/A-I-2.
- e. Remove pages A-I-3/A-I-4 and insert new page A-I-3.
- f. Remove page A-II-1 and insert new page A-II-1.
- g. Remove pages B-1/B-2 and insert new pages B-1/B-2.
- h. Remove pages C-I-A-1/C-I-A-2 and insert new pages C-I-A-1/C-I-A-2.
- i. Remove pages C-I-B-1/C-I-B-2 and insert new pages C-I-B-1/C-I-B-2.
- j. Remove pages C-I-B-3/C-I-B-4 and insert new pages C-I-B-3/C-I-B-4.
- k. Remove pages C-II-1/C-II-2 and insert new pages C-II-1/C-II-2.
- l. Remove page C-III-1 and insert new page C-III-1.
- m. Insert new page C-IV-1.
- n. Remove pages E-I-1/E-I-2 and insert new pages E-I-1/E-I-2.
- o. Remove Page E-I-A-1 and insert new page E-I-A-1.
- p. Remove page E-I-B-1 and insert new page E-I-B-1.
- q. Remove page E-I-C-1 and insert new page E-I-C-1.
- r. Remove page E-I-D-1 and insert new page E-I-D-1.
- s. Remove pages E-IV-1/E-IV-2 and insert new pages E-IV-1/E-IV-2.
- t. Remove pages E-V-1/E-V-2 and insert new pages E-V-1/E-V-2.
- u. Remove page H-1 and insert new page H-1.

3. Upon completion of the action in paragraph 2, enter change notation in Record of Changes and enter this letter as pages iii and iv to the subject operation order.

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Distribution:
Annex X

T. B. HAYWARD
Rear Admiral
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force
Pacific (CTF 130)

Operation Order
COMHAWSEAFRON No. 339-71

Pacific Fleet
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery
Force, Pacific (CTF 130)
Pearl Harbor, Hawaii
DTG: 111900Z MAY 71
Message Ref: 1905/71

Reference: (a) COMHAWSEAFRON OPLAN 305-67
(b) DOD MGR for MSFS OPS and NASA MSC LRD Apollo Recovery Operational Procedures Manual, Revision B (16 Mar 70)

Time Zone: Use time zone plus ten (WHISKEY) for operations.

Task Organization:

130	<u>Manned Spacecraft Recovery Force, Pacific</u>	CTF 130 RADM T. B. HAYWARD (000955-20)
a. 130.1	<u>Primary Landing Area Recovery Group</u>	CO, USS OKINAWA (LPH 3) CAPT A. F. HUFF (000937-90)
130.1.1	<u>Carrier Search and Recovery Unit</u>	CO, USS OKINAWA (LPH 3) CAPT A. F. HUFF (000937-90)
	OKINAWA (LPH 3) 1 LPH HC 1 8 SH-3G UDT 11 Apollo 15 DET 9 Swimmers	
130.1.4	<u>Logistic Support Unit</u>	CO, USS KAWISHIWI (AO 146) CAPT D. M. WYAND (001024-70)
	KAWISHIWI (AO 146) 1 AO	
b. 130.2	<u>Mid-Pacific Area Recovery Group</u>	Unassigned
	(Not activated)	
c. 130.4	<u>Land-based Air Search Group</u>	PACAF DOAR (41ST ARRWG) COL F. V. SOHLE, USAF
130.4.1	<u>Hawaii Land-based Air Search and Control Unit</u>	Commander, 76TH ARRSQ
	3 HC-130 aircraft	
130.4.2	<u>Guam Land-based Air Search and Control Unit</u>	Commander, 79TH ARRSQ
	1 HC-130 aircraft	
d. 130.5	<u>Logistic Support Group</u>	CO, USS KAWISHIWI (AO 146) CAPT D. M. WYAND (001024-70)
	KAWISHIWI (AO 146) 1 AO	
e. 130.6	<u>Contingency Surface Search and Recovery Group</u>	Unassigned
	(Not activated)	

1. SITUATION. Apollo 15 will be a manned lunar mission of approximately twelve days duration with a planned EOM (end-of-mission) landing in the Pacific Ocean. The primary purpose of the mission will be to perform a manned lunar landing, further investigate the lunar surface environment, collect lunar samples, deploy ALSEP (Apollo lunar surface experiments package) and return to earth. Should TLI (translunar injection) not be effected prior to the fourth revolution around the earth the mission will become an earth orbital mission which will be supported by TF 130 with the location of the EOM landing area being a real time decision. This operation order provides for recovery operations in the PACOM (Pacific Command) area in support of the Apollo 15 mission. Launch day (F day) is currently scheduled for 26 July 1971. Any change in launch date will be promulgated by message and will require a corresponding change in support required herein. Notification by CTF 130 of a change in F day should be considered as a request to adjust support accordingly.

a. Enemy Forces. None.

b. Friendly Forces. All U.S. and allied forces operating in the PACOM area and those cooperating and supporting commands and agencies listed in Annex N to reference (a).

c. Attachments and Detachments. Attachments and detachments will be in accordance with Appendix I, Annex A, Recovery Force Schedule of Events and as follows:

(1) KAWISHIWI. CTF 130 will exercise operational control of KAWISHIWI as TG 130.5 for training and transit. As soon as practicable, from a communications standpoint, KAWISHIWI will CHOP (change operational control) to CTG 130.1 as CTU 130.1.4 for replenishment and EOM support. When released by CTG 130.1, KAWISHIWI will CHOP to CTF 130.

(2) Land-based Air Search Group

(a) 130.4.1 (Hawaii). From EPO (earth parking orbit) insertion (about 12 minutes after launch) until TLI one dedicated ARRS Apollo configured HC-130 aircraft with 30 minute reaction time will be required. Backup will be provided by one non-dedicated ARRS SAR alert (Apollo configured) HC-130. In the event of a landing the backup aircraft would be utilized if time and availability permit. From TLI to TEI (transearth injection) two HC-130's with initial 2 hour reaction times are required. Once the mission trajectory has been established, longer reaction times will permit support by two ARRS SAR alert (Apollo configured) HC-130's. At about TEI three ARRS Apollo configured HC-130's will be required. Two of the HC-130's are required for dedicated EOM support. The third HC-130 is provided for backup and STAR (surface to air retrieval) support as required.

(b) 130.4.2 (Guam). One ARRS SAR alert (Apollo configured) HC-130 required from EPO insertion until entry minus 24 hours.

2. MISSION. Units of this force will conduct training, plan and execute search and recovery operations in order to recover safely the Apollo 15 astronauts and CM (command module) in the event of a planned or contingency landing in the PACOM area.

3. EXECUTION. This force will conduct operations to locate and recover the Apollo CM and its crew in the event of a planned or contingency landing in the PACOM area.

a. Primary Landing Area Recovery Group. Train for, conduct, coordinate and control search and recovery operations in and adjacent to the Apollo 15 primary landing area and the deep space abort landing area in accordance with references (a) and (b) and this operation order.

b. Land-based Air Search Group. Train for, conduct, coordinate and control land-based air operations in the PACOM area in support of planned and contingency recovery operations in accordance with references (a) and (b) and this operation order. Provide Apollo configured aircraft to CTG 130.1 as required. "Apollo configured" denotes aircraft equipped with long-range fuel tanks, an ADDRS kit and three pararescuemen.

c. Logistic Support Group. Train for backup surface recovery support and deploy to the vicinity of EOM. As CTU 130.1.4 refuel OKINAWA, provide backup surface recovery support uprange of EOM target point, and special mission support as assigned.

d. Contingency Surface Search and Recovery Group. If activated, conduct, coordinate and control contingency surface search and recovery operations as directed by CTF 130.

e. Coordinating Instructions

(1) This operation order is effective for planning and training upon receipt and for execution without signal at 0800W on 14 July 1971. It is cancelled 10 days after completion of the Apollo 15 mission. Destroy without report.

(2) All surface and air units will be prepared to support contingency recovery operations, if required, in accordance with Annex D.

(3) Reference to days before or after Zulu launch date is defined as F-____ days or F+____ days. Times surrounding launch time are defined as T-____ or T+____ (hours) (minutes) (seconds). Reference to days before or after Zulu recovery date is defined as R-____ or R+____ days.

(4) Week-end and holiday sailings are authorized when required to meet manned spacecraft recovery commitments.

(5) Portions of this operation order which are in conflict with reference (a) shall supersede that plan for the Apollo 15 mission.

(6) In the event of an unidentified submarine contact, Task Group Commanders will make an unclassified report to CTF 130 via primary recovery command and control voice or teletype and await further instructions.

4. ADMINISTRATION AND LOGISTICS

a. Logistic support will be in accordance with applicable CINCPACFLT (Commander in Chief, Pacific Fleet) and CINCPACAF (Commander in Chief, Pacific Air Forces) directives and Annex L to reference (a).

b. Force/Activity Designator TWO (F/AD II) is authorized for procurement of material in support of this mission.

c. Reports will be submitted in accordance with Annex R and reference (b).

d. Training will be accomplished in accordance with Annex G to reference (a) as modified by Annex G to this operation order.

e. Meteorological measurements and reports will be in accordance with Annex M.

f. Public affairs matters will be handled in accordance with Annex P to reference (a) and the detailed Press Plan to be provided.

g. Photographic requirements will be handled in accordance with Annex Q to reference (a).

5. COMMAND AND SIGNAL

a. The Secretary of Defense has directed that all Department of Defense forces supporting manned spacecraft recovery operations shall be under the operational control of the DOD Manager (Department of Defense Manager for Manned Space Flight Support Operations) from T-24 hours until recovery and post-flight operations are completed, unless released earlier.

b. Surface forces will CHOP by movement report to CTF 130 as directed by Commander FIRST Fleet.

c. Land-based air support forces will CHOP by message to CTF 130 no later than T-26 hours.

d. CTF 130 with TF 130 will CHOP to the DOD Manager at T-24 hours or as directed.

e. Commander Task Force 130, located at Manned Spacecraft Recovery Control Center, Kunia, Hawaii is operational commander of the Manned Spacecraft Recovery Force, Pacific.



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Annexes:

- A - Concept of Operations
- B - Apollo 15 Mission
- C - Planned Recovery Operations
- D - Contingency Recovery Operations
- E - Communications
- G - Readiness and Training
- H - Medical
- M - Meteorology
- R - Reports
- X - Distribution

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Annex A

Concept of Operations

1. General. For recovery purposes, geographical areas of responsibility are designated on a global basis utilizing military SAR boundaries.

a. CINCPAC (Commander in Chief, Pacific) is the Unified Commander responsible for military SAR in the PACOM (Pacific Command) area.

b. CINCPACFLT has been designated executive agent for CINCPAC to coordinate and implement DOD support of manned spacecraft recovery in the PACOM area.

c. CINCPACFLT, in his Operation Order 220 (YR) (NOTAL), assigns Commander Hawaiian Sea Frontier, as CTF 130, the responsibility for planning and conducting search and recovery operations in the PACOM area in support of the manned space flight program.

d. Under CTF 130, task groups will be deployed to areas recommended by NASA (National Aeronautics and Space Administration) in the PACOM area. These forces will be specially equipped and trained to locate the CM (Command module), provide on-scene assistance in the form of flotation equipment and medically trained pararescuemen or UDT swimmers and retrieve the astronauts and CM. The mission of these forces will be to locate and recover the astronauts and CM within the framework of recovery requirements provided by NASA, consistent with safe practices, and to deliver them by the most expeditious means to a point designated by NASA. In so doing, there should be no injury to astronauts or recovery personnel and a minimum of damage to the CM resulting from the recovery operations. A recovery force schedule of events is contained in Appendix I.

2. Description of Landing Areas. Landing areas are described in three general phases as follows:

a. Earth Parking Orbit Phase. Following ascent, the spacecraft reaches the EPO (earth parking orbit) phase and remains in orbit for the first two or three revolutions while the spacecraft systems are checked out and made ready for TLI (translunar injection). Since a landing is not anticipated during this phase, a primary EOM (end-of-mission) landing area is not defined. Landing areas associated with the earth parking orbit phase are as follows:

(1) Secondary Landing Area. A secondary landing area is an area in which a landing could occur after launch and during the earth parking orbit phase. The probability of such an occurrence is sufficiently high to warrant a requirement for a recovery ship. Earth parking orbit secondary landing areas are configured to include target points and dispersion areas associated with low-speed entries from near-earth orbits. These areas are selected to provide recovery support at suitable time intervals throughout the EPO phase of the mission. The secondary landing area is an 80 x 210 nautical mile high-probability dispersion ellipse oriented along the entry ground track and centered on the target point. For this mission, secondary landing areas will be required for three revolutions (prior to TLI) and are selected in two general locations: West Atlantic (Zone 1) and mid-Pacific (Zone 4). Should a landing occur in the mid-Pacific area, the PRS will proceed to the landing point and effect recovery. The mid-Pacific recovery zone is a 750 nautical mile circle centered at 19°00'N, 172°30'W.

(2) Contingency Landing Area. The earth parking orbit contingency landing area is all that area outside the secondary landing area, as defined in paragraph 2.a.(1), above, in which a landing could possibly occur. For this mission it includes the area between 40° North and 40° South latitudes. The probability of a landing in this area warrants a requirement for only land-based Apollo configured rescue aircraft. Aircraft staging bases to support the contingency landing area are contained in Appendix II. For the earth parking orbit phase of this mission, and any real-time alternate long-duration earth orbital mission, the contingency area is divided into four sectors as follows:

(a) Contingency Sector A from 80° West meridian east to 20° East.

(b) Contingency Sector B from 20° East meridian east to 120° East.

(c) Contingency Sector C from 120° East meridian east to 160° West.

(d) Contingency Sector D from 160° West meridian east to 80° West.

b. Deep Space Phase. Upon completion of on board systems checkout, the spacecraft is ready to be injected, during the second or third revolution, into a translunar trajectory. The deep space phase begins with a successful TLI maneuver and includes the spacecraft's travel to and from the moon and terminates with entry to the end-of-mission landing area. Landing areas

associated with the deep space phase are targeted for latitudes on the MPL (mid-Pacific line) illustrated in Appendix II. Specific areas are as follows:

(1) Secondary Landing Area. Deep space secondary landing areas are configured to include the target point and dispersion area associated with high-speed entry from deep space. These areas are selected to provide recovery support at suitable time intervals throughout the translunar, lunar orbit, and transearth phases of the mission and are located on or near ship/Apollo configured aircraft supported recovery lines or zones which are spaced to provide varying return times. For the Apollo 15 mission, the deep space secondary landing areas will be located on the MPL or the AOL (Atlantic Ocean Line), see Appendix II, and are bounded by:

(a) A 125 nautical mile radius circle centered 275 nautical miles uprange from the target point.

(b) A 125 nautical mile radius circle centered 25 nautical miles uprange from the target point.

(c) Two tangential lines connecting the circles.

The target point will be approximately 1,190 nautical miles downrange of the entry point. If the entry range is increased to avoid bad weather, the landing area moves with the target point. The PRS and two HC-130 aircraft are required to provide secondary landing area support for the MPL. An SRS will provide support in the Atlantic.

(2) Contingency Landing Area. Deep space contingency areas are associated with high speed entries and include all that area outside the primary and secondary landing areas. Aborts performed during the deep space phase of the mission will be targeted toward the MPL, shown in Appendix II. The deep space contingency landing area includes all that area between 40° North and 40° South latitudes. This area is divided into four sectors, in the same manner as in sub-paragraph 2.a.(2), and requires land-based Apollo configured rescue aircraft support only.

c. End-of-Mission Phase. The end-of-mission phase begins with entry into the atmosphere at about 400,000 feet altitude over the western Pacific and terminates with the successful recovery of the astronauts and command module. End-of-mission landing areas are as follows:

(1) Primary Landing Area. The normal end-of-mission landing area is located on or near the MPL. The latitude of the landing area depends primarily on the declination of the moon at TEI (transearth injection). For this mission, the landing area will be in the vicinity of 26°07'N, 158°00'W for the 26 July launch window. The CM maneuvering foot print for lunar return entry extends from about 1,050 nautical miles to 1,800 nautical miles from entry at 400,000 feet altitude. This maneuvering capability allows the CM to avoid adverse weather conditions that may exist at the target point. The predicted target point is 1,190 nautical miles downrange from entry. The size and dimensions of the end-of-mission landing area are identical to the deep space secondary landing area discussed in sub-paragraph 2.b.(1) above. Detailed end-of-mission procedures are contained in Annex C.

(2) Contingency Landing Area. The contingency landing area for the end-of-mission phase includes all of the area outside the primary landing area between 40° North and 40° South latitude.

3. Reaction, Access and Retrieval Times. Reaction, access and retrieval times are criteria established by NASA to describe the level of support required in CM landing areas. These times only apply under favorable operating conditions as listed in paragraph 3.d. below.

a. Reaction Time. Reaction time is the elapsed time between notification of a unit to proceed to a location and the time it departs for that location.

b. Access Time. Access time is the maximum allowable interval between the predicted landing time of the CM, or notification of the recovery force commander that an unpredicted landing has occurred, and the time when the CM flotation collar is installed by pararescuemen or UDT swimmers and the CM hatch is opened. Access time includes reaction time, time en route to CM landing point, search time, and time for pararescue procedures, including installation of the flotation collar and opening of the CM hatch.

c. Retrieval Time. Retrieval time requirements are applicable to both CM crew and the CM and can be defined separately. Retrieval time includes reaction time, time en route to the CM landing point and approach time prior to beginning retrieval.

(1) CM Crew. The maximum allowable time, under favorable operating conditions, between the predicted time of landing of the CM, or notification of the recovery force commander that an unpredicted landing has occurred, and the time when the crew is delivered aboard ship or to a land base where biomedical examination can commence.

(2) CM. The maximum allowable time between the predicted time of landing of the CM, or notification of the recovery force commander that an unpredicted landing has occurred, and the time when the CM is positioned aboard ship in such a way that required post-landing procedures can commence.

d. Favorable Operating Conditions. Favorable operating conditions presume such factors as (a) the proper functioning of electronic and visual locating aids on the CM for their programmed lifetime, (b) the proper functioning of equipment aboard the aircraft and ships, (c) acceptable weather conditions for recovery forces en route to and at the landing point, (d) normal safe operating conditions for recovery force equipment and personnel, (e) availability of recommended recovery forces, (f) NASA furnishing an estimated landing point which is accurate within 100 nautical miles or a datum that has been established, and (g) cooperation of foreign governments in obtaining overflight clearances in the event a contingency landing occurs. The final judgment of acceptability of operating conditions and capabilities of recovery equipment and personnel is the responsibility of the local recovery force commander.

4. Primary/Secondary Landing Area Recovery Concept. The basic concept of primary landing area recovery is that recovery forces capable of locating and recovering the astronauts and CM within the access and retrieval times specified by NASA, will be prepositioned within the end-of-mission primary landing area. The basic concept of the secondary landing area, for purposes of this mission, is that the PRS will be on station in the secondary landing area to provide support. A detailed plan for primary/secondary landing area recovery is contained in Annex C.

5. Contingency Recovery Concept. The basic concept of contingency recovery is that, in the event of a contingency landing, Apollo configured rescue aircraft, positioned at designated locations and controlled directly by CTF 130, will provide support within the access times specified by NASA. Additional recovery forces and assistance may be requested from commanders having regional SAR responsibilities. Contingency recovery planning for this mission is contained in Annex D.

6. Command Relationships. See Annex A, reference (a).

7. Launch Time, Holds and Scrubs. The exact launch time and date for this mission will be provided to recovery forces by message. Any malfunctions detected before launch in spacecraft or launch vehicle systems, ground support equipment or instrumentation, which could result in failure to achieve the primary objective of the mission, will be cause to hold or cancel the mission until the cause of the malfunction has been eliminated. In the event of a launch delay on 26 July, the mission will be scrubbed and rescheduled for 27 July, 24 August or 25 August.

8. Interference. In the event of interference with recovery operations, procedures will be in accordance with guidance set forth in Annex B to CINCPACFLT OPORD 220-YR (NOTAL).

9. Communications. It is essential that task group and task unit commanders keep CTF 130 advised on a continuing basis of action being taken, planned action, and deviations from planned actions both during and subsequent to actual CM recovery operations. Communications will be in accordance with Annex E.

10. Alternate Mission. In the event that TLI is unsuccessful and it becomes necessary to select a long-duration earth orbital mission as an alternate, the two recovery zone concept will be implemented. The West Pacific and East Atlantic recovery zones are no longer used. Reference (a) contains procedures for an earth orbital long-duration mission. The location of the EOM landing area will be a real time decision; the area will be supported by the primary recovery ship.

Authenticated:

R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Appendices:

- I - Recovery Force Schedule of Events
- II - Recovery Lines and Rescue Aircraft Locations

Appendix I to Annex A

Recovery Force Schedule of Events
(Based on 261334Z Jul 1971 Launch)

Event Number	Date/Time	Participants	Event/Remarks	Location
	July			
1	081600Z (0900T) (0600W)	OKINAWA, HC 1	Underway for Pearl Harbor	San Diego
2	141800Z (0800W)	TF 130	Execute CTF 130 OPCODE No. 339-71	
3	141800Z (0800W)	CTG 130.1 (OKINAWA)	CHOP to CTF 130 with HC 1 embarked	Pearl Harbor
4	141800Z (0800W) (approx)	UDT 11, Apollo 15 Det	Embark in OKINAWA	Pearl Harbor
5*	151900Z (0900W)	TG 130.1, KAWISHIWI	Pre-mission briefing by CTF 130, NASA, and 41ST ARRWG	OKINAWA ward- room
6	151900Z (0900W)	OKINAWA	Load and inventory recovery equipment and commence inport training under direction of CTF 130 and NASA	Pearl Harbor Pier B 25 & 26
7*	152330Z (1330W)	Key communications personnel of OKINAWA, KAWISHIWI, NAVCOMMSTA HONO, 41ST ARRWG, 76TH ARRSQ and HC 1	Communications briefing by CTF 130 communications personnel	OKINAWA ward- room
8*	161830Z (0830W)	OKINAWA and KAWISHIWI weather personnel	Weather observation and report- ing training conducted by FWC Pearl	FWC Pearl
9	161830Z (0830W)	CIC/HDC personnel of OKINAWA	CIC/HDC brief and CPX by CTF 130 operations and plans personnel	OKINAWA SACC/HDC
10	191800Z to 212300Z (190800W to 211300W)	TG 130.1, Staff, CTF 130, NASA	OKINAWA underway for at-sea training. Return upon comple- tion. Training can be contin- ued through 22 July if required.	OP Areas G-2, G-4, G-6, G-14 and G-16
11*	222300Z (1300W)	TG 130.1, Staff, CTF 130, NASA, 41ST ARRWG, 76TH ARRSQ, KAWISHIWI	OKINAWA pre-sail conference	OKINAWA ward- room
12	230200Z (221600W)	TG 130.1	Underway for initial abort station 14-20N, 173-20W at minimum SOA 15 knots	Pearl Harbor
13	230200Z (221600W)	Staff, CTF 130	RCC Pacific manned	Kunia Facility
14	241334 (0334W)	CTF 130	CTF 130 make preliminary readiness report to DDMS	

Operation Order
COMHAWSEAFRON No. 339-71

Event Number	Date/Time	Participants	Events/Remarks	Location
	July			
15	241730Z (0730W)	TG 130.1, CTG 130.4, CTF 130, DDMS	PRS translunar abort simulation exercise	Approx 17-25N, 166-43W en route abort station
16	251134Z (0134W)	TG 130.4	CHOP to CTF 130	
17	251134Z (0134W)	All TG Commanders	Make readiness reports to CTF 130	
18	251334Z (0334W)	CTF 130	CHOP to DDMS	
19	260634Z (252034W)	CTF 130	Commence passing countdown information to TF 130	
20	261134Z (0134W)	All TG Commanders	Confirm readiness to CTF 130 (Further readiness assumed unless advised otherwise)	
21	261334Z (0334W)	Apollo 15	Lift-off	Cape Kennedy
22	261334Z (0334W)	TG 130.1	Arrive initial abort station commence support of abort target points	14-20N, 173-20W
23	271800Z (0800W)	CTG 130.5, KAWISHIWI	CHOP to CTF 130 by movement report	Pearl Harbor
24	301800Z (0800W)	KAWISHIWI	Load and inventory equipment under direction of CTF 130 and NASA. Commence inport training	Pearl Harbor Pier H
25*	301830Z (0830W)	KAWISHIWI	Weather observation and reporting training conducted by FWC Pearl	FWC Pearl
26*	302300Z (1300W)	KAWISHIWI	Pre-mission brief	KAWISHIWI wardroom
27*	310030Z (301430W)	KAWISHIWI communications personnel	Communications briefing by CTF 130 communications personnel	KAWISHIWI wardpom
*Note: KAWISHIWI participation in events 5, 7 and 8 is desired if personnel are available. If participation in events 5, 7 and/or 8 is not possible, events 25, 26 and/or 27 will be conducted. KAWISHIWI participation in event 11 desired if personnel are available.				
	August			
28	021800Z to 030200Z Aug (0800W to 1600W)	KAWISHIWI, 41ST ARRWG pararescuemen, Staff, CTF 130, NASA	KAWISHIWI underway for at-sea recovery training. Training can be continued through 3 and 4 August, if required	OP Area BP

Operation Order
COMHAWSEAFRON No. 339-71

Event Number	Date/Time	Participants	Events/Remarks	Location
	August			
29	041900 (0900W)	KAWISHIWI, Staff CTF 130, NASA	KAWISHIWI pre-sail conference	KAWISHIWI wardroom
30	050200 (041600W)	TG 130.5	Underway to refuel OKINAWA. SOA 13 knots. Underway time may be delayed if a higher SOA is utilized.	Pearl Harbor
31	051700Z (0700W) (approx)	TG 130.5	CHOP to CTG 130.1 as CTU 130.1.4 as soon as practi- cable.	
32	052046Z (1046W)	TG 130.1, CTG 130.4, CTF 130, DDMS	PRS end-of-mission simula- tion exercise	EOM area
33	060030Z (051430W)	TG 130.1	KAWISHIWI refuel OKINAWA	EOM area
34	061800Z (0800W)	TG 130.1	Conduct logistics flights	22-28N, 157-12W (Approx)
35	072046Z (1046W)	CTU 130.1.4	Support recovery as PRS backup	25-42N, 158-31W
36	072046Z (1046W)	Apollo 15, TG 130.1	Apollo 15 landing	In recovery ship array sup- porting 26-07N, 158-00W (EOM target point)
37	072046Z (1046W)	TU 130.1.4	Close splashdown position. Upon successful recovery by PRS depart for Pearl Harbor, SOA 13 knots. CHOP to CTF 130 as CTG 130.5	25-42N, 158-31W
38	072300Z (1300W)	TG 130.1	Depart for Pearl Harbor. SOA as necessary	26-07N, 158-00W
39	080300Z (071700W)	TG 130.1	Launch aircraft with lunar samples and data to Hickam AFB, Hawaii	Approx. 200 nm from Hickam AFB, Hawaii
40	081900Z (080900W)	TG 130.1	Launch aircraft with astro- nauts to Hickam AFB, Hawaii	Vicinity Pearl Harbor
41	082000Z (1000W)	TG 130.1	Upon arrival commence off- load	Pearl Harbor
42	082300Z (1300W)	KAWISHIWI	Offload recovery equipment	Pearl Harbor

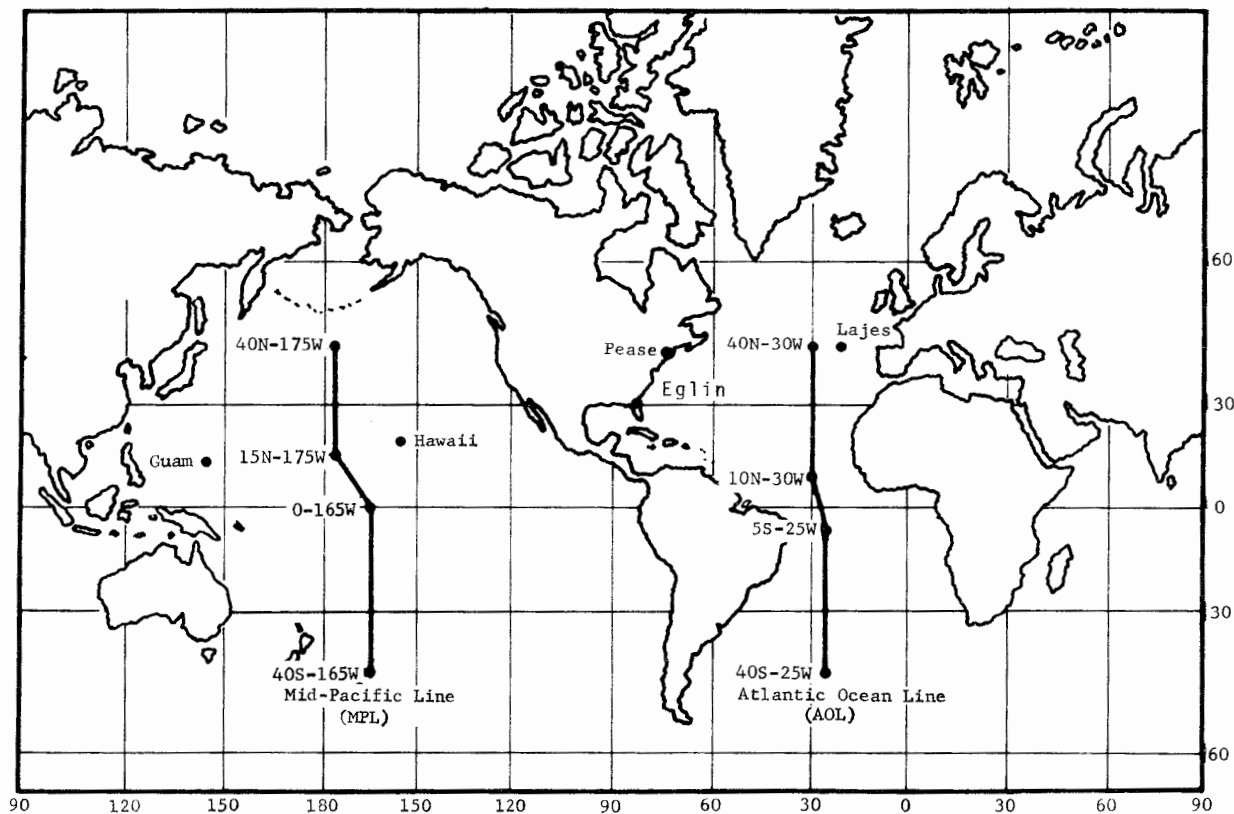
Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Appendix II to Annex A
Recovery Lines and Rescue Aircraft Locations



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Annex B

Apollo 15 Mission

1. General. The general description and objectives of the overall Apollo program, spacecraft characteristics, location aids and recovery equipment used in Apollo are set forth in Annex B to reference (a). This Annex presents a detailed description of the Apollo 15 mission.

2. Apollo 15 Mission Plan. The Apollo 15 spacecraft will be launched on 26 July 1971 from Complex 39A at the Kennedy Space Center, Florida by the Saturn V launch vehicle on a launch azimuth ranging from 80° to 100°. Crewmen are mission commander David R. Scott, command module pilot Alfred M. Worden and lunar module pilot James B. Irwin.

a. Insertion into a 90 nautical mile circular EPO (earth parking orbit) will occur shortly after lift-off. Following confirmation of the desired orbit, the spacecraft systems will be checked out and made ready for the next maneuver. The EPO phase of the mission can last up to about 4 hours, or 3 revolutions.

b. Upon completion of on board systems checkout, the spacecraft will be ready, during the second or third orbit, to be injected into a translunar trajectory. TLI (translunar injection) is accomplished by a second burn of the S-IVB. This maneuver will occur over the Pacific Ocean and will place the spacecraft on a non-free return trajectory. TLI is scheduled to occur during the second revolution, 2 hours and 50 minutes after lift-off.

c. After completion of a satisfactory TLI burn, the spacecraft will be in the TLC (trans-lunar coast) stage. The spacecraft will coast approximately 3 days to reach the moon; during this time it has the capability to terminate the normal mission and safely return to earth. The exact TLC time varies according to the launch azimuth. Soon after S-IVB shutdown, the T & D (transposition and docking) maneuver will be performed. The T & D operation involves the CSM (command and service module) separating from the SLA/LM/S-IVB (spacecraft-lunar module adapter/lunar module/third stage) combination, turning around, and docking with the stored LM. The LM will then be extracted by backing the CSM away from the S-IVB. The S-IVB will then be targeted for lunar impact. During TLC several mid-course corrections may be performed in order to assure that the spacecraft will arrive at the correct location for LOI (lunar orbit insertion).

d. The LOI maneuver will take place behind the moon after the spacecraft has passed out of line of sight to earth. The maneuver is performed with the SPS (service propulsion system). After a deboost burn the spacecraft will be in a 58 by 170 nautical mile elliptical orbit around the moon.

e. Approximately two revolutions later, the DOI (descent orbit insertion) maneuver will be performed with the SPS. This maneuver will place the spacecraft in a 10 by 58 nautical mile orbit. The spacecraft will stay in this orbit approximately 22 hours before the LM separates from the CSM. Approximately two revolutions after separation the LM's DPS (descent propulsion system) is ignited and the powered descent maneuver is initiated. Approximately 12 minutes later, the LM will land on the lunar surface. The lunar landing site is Hadley Apennine.

f. After LM touchdown, a checkout of the LM will be performed to assess its launch capability. There will be three 7 hour periods of simultaneous exploration, separated by eat/rest periods.

g. After a lunar surface stay time of approximately 66 hours, the ascent stage of the LM will lift off the lunar surface, leaving the descent stage behind. The ascent stage of the LM will lift off the lunar surface, leaving the descent stage behind. The ascent is performed utilizing the APS (ascent propulsion system) which places the ascent stage into a 9 by 51 nautical mile orbit. After insertion into this orbit, one LM RCS and one APS burn will be performed, making the trajectory changes necessary to rendezvous with the CSM. Rendezvous and docking will occur approximately 90 minutes after insertion of the LM into lunar orbit. After the LM has docked, the LM crew will transfer to the CSM taking with them the data and samples collected on the lunar surface. After crew transfer, the LM is jettisoned and targeted for lunar impact. Preparations are then made for the next major maneuver, TEI (transearth injection). The total lunar stay time, LOI to TEI, will be approximately 145 hours.

Operation Order
COMHAWSEAFRON No. 339-71

h. TEI, using the SPS, will place the CSM on an earth intersecting trajectory. CSM plane changes in lunar orbit will reduce the SPS propellant such that aborts after a normal TEI cannot move the EOM (end-of-mission) area out of the Pacific Ocean. Following TEI, the CSM begins the 71 hour TEC (transearth coast) leg of its journey. Several small mid-course corrections may be made to assure entry conditions required to reach the primary landing area in the Pacific Ocean at the proper time. Shortly before arrival at the entry point, the SM (service module) will be jettisoned.

i. Following SM jettison, the CM (command module) will be oriented heat shield forward for entry. The entry phase will begin over the western Pacific Ocean at about 400,000 feet altitude. Normal range from this point to splashdown is 1,190 nm. Splashdown will be at approximately 26°07'N, 158°00'W at about 072046Z (071046W) August 1971.

j. The Apollo 15 normal mission sequence of events is contained in Apollo 15 Recovery Requirements published by NASA and distributed by CTF 130 on an as-needed basis.

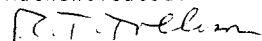
3. Apollo 15 Mission Objectives

- a. Land men on the lunar surface and concurrently demonstrate point landing capability.
- b. Perform selenological inspection, survey and sampling of materials in a preselected region of Hadley Apennine, utilizing a lunar roving vehicle.
- c. Deploy and activate the ALSEP (Apollo Lunar Surface Experiment Package).
- d. Develop man's capability to work in the lunar environment.
- e. Obtain photographs of candidate exploration sites.
- f. Conduct inflight experiments and photographic tasks in lunar orbit.
- g. Return safely to earth.

4. Apollo 15 Spacecraft Configuration. Appendix II, Annex B to reference (a), contains descriptions of the spacecraft and spacecraft systems. Appendix III, Annex B to reference (a), contains descriptions of location aids and recovery equipment which will be used for the Apollo 15 mission.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific

Authenticated:



R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Annex C

Planned Recovery Operations

1. General. Recovery operations in the Pacific will be in accordance with the procedures set forth in Annex C to reference (a), as modified herein.

2. Landing Area Support. Annex A contains the description of landing areas associated with the three phases of the mission. Additional information concerning the support of these areas is as follows:

a. Earth Orbital Phase. Recovery support for this phase of the mission consists of supporting the first three revolutions prior to TLI and will be as follows:

(1) Aircraft Support. Apollo configured HC-130 aircraft will be located at staging basis specified in Appendix I to provide the capability for rapid location of the command module and ensure that first level medical assistance is available to the astronauts as soon as possible. In order to minimize the number of aircraft required to support both planned and contingency recovery, locations of land-based search and rescue aircraft are such that some locations may support both planned and contingency recovery. The aircraft based at Hickam AFB are responsible for meeting the access time specified for each target point; to meet these access times one aircraft will be on 30 minute strip alert and one aircraft will be provided as backup during the earth orbital phase. In the event of a landing the alert aircraft will proceed to its assigned station abeam the ground track at the target point and 50 nautical miles north. If time permits, the backup aircraft will take station 165 miles uprange of the target point and 100 miles north of the ground track.

(2) Ship Support. Surface forces (a primary recovery ship) for this phase will be located as indicated in Appendix I to provide recovery and retrieval capability in support of target points during the first three revolutions. Specific requirements of the recovery operation include the following:

- (a) Exercise of positive command and control of forces
- (b) Rapid location of the CM
- (c) Retrieval of the astronauts and CM within the designated retrieval time
- (d) Expeditious on-scene assistance to the astronauts
- (e) Retrieval of drogue parachutes, main parachutes, apex cover, etc., as required

by NASA.

b. Deep Space Phase. Recovery support for this phase of the mission consists of supporting landings occurring from deep space aborts. These aborts could be performed in the interval from the beginning of TLI until the beginning of TEI. Target points resulting from aborts will be selected on or near the mid-Pacific line, so that recovery forces may be positioned along this line at a latitude opposite to the moon's declination. PRS positioning constraints are contained in Tab B to Appendix I. This positioning will be confirmed or corrected on a real-time basis by CTF 130. Aircraft and ship support will be as follows:

(1) Aircraft Support. Both Apollo configured HC-130 aircraft and ship-based helicopters will support a landing from deep space.

(a) From TLI until TEI, the Apollo configured aircraft in the primary landing area will be positioned as follows:

1. One aircraft 165 nautical miles uprange of the target point and 100 nautical miles north of the ground track. The other aircraft will be located 165 nautical miles downrange and 100 nautical miles north of the ground track.

(b) Helicopter positions are listed in Appendix I and shown in Appendix II.

(2) Ship Support. Ship support for this phase of the mission consists of positioning the PRS along the MPL at a latitude that will allow coverage of the target points designated by NASA. The exact latitude will depend on the time that the abort is initiated and the reason for the abort, e.g., fuel becomes critical or it is necessary to return the crew to earth in the shortest length of time. CTF 130 will furnish updated ship positions and target points to support deep space aborts as soon as they are available. Specific requirements for ship recovery operations are identical to those in sub-paragraph 2.a(2), above.

c. End-of-Mission Phase. Recovery support for this phase of the mission consists of supporting the end-of-mission primary landing area. Based on a launch azimuth of 80° with TLI occurring in the 2nd revolution, the end-of-mission target point is 26-07N, 158-00W. Aircraft and ship support will be as follows:

(1) Aircraft Support. From TEI until end-of-mission, the aircraft in the primary landing area will be positioned as listed in sub-paragraph 2.b.(1) above. (See Appendix I).

(2) Ship Support. The end-of-mission ship support will be as illustrated in Appendix II. Specific requirements for ship recovery operations are identical to those in sub-paragraph 2.a.(2) above.

3. Access and Retrieval Times. Access and retrieval times are shown in Appendix III.

4. Control of Aircraft. It is essential that positive control of the mission aircraft operating in the primary landing area be maintained by the appropriate task group/unit commander. Special operating instructions are contained in Annex C to reference (a) and modified as follows:

a. Operational procedures for recovery require stationary airspace reservations for all participating aircraft and immediate and unrestricted movement to any portion of the area in which a command module may land. This airspace is known as the "Splinter Shield." The dimensions of the "Splinter Shield" include:

(1) A tubular airspace with 50 nm radius centered on the target point. This airspace will extend from the earth's surface to infinity and will accommodate the CM during its reentry.

(2) An area 200 nm along and 25 nm either side of the planned ground track. The center of this space shall be at the calculated point of CM impact. This airspace will normally be used by aircraft operating from a surface ship and will extend from the surface to flight level 200. (Note: A flight level is a surface of constant atmospheric pressure which is related to the standard pressure datum of 29.92 inches of mercury. Flight level 200, for example, would result in an altitude of approximately 19,000 feet if actual pressure were 30.92" Hg or approximately 21,000 feet if actual pressure were 28.92" Hg).

(3) An airspace block to accommodate rescue aircraft operating between flight levels 200 and 250. This airspace will be oriented along the ground track and will extend 200 nm up-range and 200 nm downrange from the target point and 150 nm either side of the ground track.

The "Splinter Shield" will be established forty-five minutes prior to the scheduled CM landing and will remain in effect until no longer required for recovery operations.

b. Search aircraft planning operations within the "Splinter Shield" shall:

(1) Operate on individual flight plans to and from the "Splinter Shield."

(2) Include the point of entry into the "Splinter Shield" area, the estimated time in the area, and the words "Splinter Shield Aircraft" and "MARSA" (military assumes responsibility for separating aircraft) in addition to the normal items on the flight plan.

(3) Advise the controlling agency when they have penetrated the "Splinter Shield" area.

(4) Obtain clearance prior to departing the "Splinter Shield" area. Aircraft commanders shall include in their request their present position, the coordinates and time at which they will vacate the area, and the altitude desired. Aircraft shall vacate the area at the assigned altitude and at the coordinates specified in the ATC clearance.

c. CTF 130 shall assume search and rescue responsibility for aircraft operating within the "Splinter Shield" area.

d. The astronaut voice frequency, 296.8 MHz (259.7 MHz secondary), should be utilized for on-scene air-to-air and air-to-surface communications from CM main parachute deployment until the CM is recovered aboard the recovery ship.

e. The first aircraft to arrive over the CM will establish communications with the astronauts on 296.8 MHz, determine their physical condition and pass this information to the TF 130 surface unit commander for relay to CTF 130. This frequency should also be used to keep the astronauts advised of the progress of recovery operations.

f. No radio transmissions shall be made on frequency 243.0 MHz during the recovery phase of the mission except in the event of an actual emergency. This frequency is utilized by the recovery beacon which is activated after main parachute deployment.

5. Recovery Procedures. Detailed recovery procedures are contained in the Apollo Recovery Operational Procedures Manual, Revision B.

a. Astronaut Recovery. Apollo 15 will be a non-quarantine mission. Special equipment and procedures for decontamination and quarantine will not be required.

b. Main Parachute Retrieval. Retrieval of the main parachutes and apex cover, which may be floating in the landing area, is highly desirable but should not interfere with crew and CM retrieval operations or delay the departure of the PRS from the recovery area.

6. Post Retrieval Operations. After the astronauts and CM are retrieved and safely on board one of the units of the recovery force, detailed post retrieval procedures must commence. The astronauts and CM, together with mission and recovery data, must be delivered to the shore base(s) designated by NASA before the recovery mission is complete. Appendix IV contains post retrieval operations to be accomplished by the units of TF 130 effecting recovery.

7. Communications. Planned recovery communications will be in accordance with Annex E. In view of the national interest in Project Apollo, it is essential that task group and task unit commanders keep CTF 130 advised on a continuing basis of action being taken, planned action and deviations from planned action both during and subsequent to actual astronaut and CM recovery operations.

8. Navigation. The importance of accurate shipboard/aircraft navigation and documented logs cannot be overemphasized. For post mission evaluation of the performance of CM systems, it is imperative that an extremely accurate position of the CM landing point be reported to NASA-MSC. To provide an accurate reference point for TACAN and radar bearings to the CM landing point, it is required that the CM recovery ship take accurate navigational fixes at the time of CM splash and retrieval. In addition to the fixes, the post mission report should include a written description of the method of obtaining these fixes.

9. ARIA (Apollo Range Instrumented Aircraft). The ARIA are Air Force C-135 aircraft that have been modified to provide for the reception, recording, and retransmission of telemetry information from the Apollo spacecraft and have the capability of automatic voice relay. The exact number and locations of these aircraft in the Pacific for this mission will be provided at a later date. The primary utilization of these aircraft will be to support network operations until CM splashdown. After splashdown, and if required by CTF 130, the ARIA will chop to CTF 130 and their primary mission will be to provide automatic relay of on-scene communications to the PRS and the CTF 130 Recovery Control Center, if within range. Their secondary mission will be to assist in electronic search operations within the landing area as directed and as equipment capabilities permit.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:



R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendices:

- I - Station Assignments
- II - Support Positioning Illustrations
- III - Access and Retrieval Times

Appendix I to Annex C

Station Assignments

1. General. Station assignments contained herein have been established to meet the primary/secondary landing area access and retrieval times required by NASA.
2. Recovery Station Assignments. Station assignments for the mission are as follows:
 - a. Ships. Anticipated ship station assignments are contained in Tab A. Ships will operate in compliance with this tab, as updated and/or confirmed by CTF 130 throughout the mission. The event numbers in Tab A are consistent with the event numbers used in Appendix I to Annex A, Recovery Force Schedule of Events.
 - b. Aircraft. Mission support aircraft station assignments and tasks are contained in Tab B.
3. The times indicated in this appendix are approximate and are based on a first opportunity launch and TLI.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Tabs:

- A - Mission Support Ship Station Assignments
- B - Mission Support Aircraft Assignments

Operation Order
COMHAWSEAFRON No. 339-71

Tab A to Appendix I to Annex C
Mission Support Ship Station Assignments
USS OKINAWA (LPH 3)

Event No.	Date/Time	Position	Mission	Remarks
12	230200Z Jul (221600W)	Pearl Harbor	Underway for initial abort station 14-20N, 173-20W	SOA 15 knots
22	261334Z Jul (260334W)	14-20N, 173-20W	Commence support of abort positions	
32	052046Z Aug (051046W)	26-07N, 158-00W	End-of-mission simulation exercise	
33	060030Z Aug (051430W)	26-07N, 158-00W (Approx)	Underway replenishment	En route vicinity of Oahu
34	061800Z Aug (060800W)	22-28N, 157-12W (Approx)	Conduct logistics flights as necessary	
36	072046Z Aug (071046W)	26-07N, 158-00W	Effect recovery	In recovery ship array
38	072300Z Aug (071300W)	26-07N, 158-00W	Depart EOM area for Pearl Harbor	SOA as necessary
39	080300Z Aug (071700W)	24-47N, 158-03W	Launch aircraft with lunar samples/film	200 nm to Hickam
40	081900Z Aug (0900W)	Vicinity Pearl Harbor	Launch aircraft with astronauts, lunar samples, and data to Hickam AFB, Hawaii	Number of aircraft as required
41	082000Z Aug (1000W)	Pearl Harbor	Arrive Pearl Harbor	Upon arrival commence offload

C-I-A-1 (CH-1)

Operation Order
COMHAWSEAFRON No. 339-71

Tab A to Appendix I to Annex C (Con't)

USS KAWISHIWI (AO 146)

Event No.	Date/Time	Position	Mission	Remarks
30	050200Z Aug (041600W)	Pearl Harbor	Underway to refuel OKINAWA	SOA 13 knots. Underway time may be delayed if a higher SOA is utilized.
33	060030Z Aug (051430W)	26-07N, 158-00W (Approx)	Refuel OKINAWA	Upon completion of replenishment proceed to 27-00N, 156-24W. Remain on station until directed to EOM position.
35	072046Z Aug (071046W)	25-42N, 158-31W	Support recovery as PRS backup	EOM station 25-42N, 158-31W
37	072046Z Aug (071046W)	25-42N, 158-31W	Close splashdown position. Upon successful recovery by PRS depart for Pearl Harbor. SOA 13 knots	Chop to normal OPCON on signal from CTF 130.
42	082300Z Aug (1300W)	Pearl Harbor	Completed	Offload recovery equipment.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

C-I-A-2 (CH-1)

Tab B to Appendix I to Annex C
Mission Support Aircraft Assignments

1. Earth Orbital and Deep Space Apollo Configured HC-130 Search and Rescue Aircraft Support

Staging Base	Parking Orbit Insertion to TLI	After TLI*	Remarks
Andersen AFB, Guam (SAR Alert)	1 aircraft with 2 hour reaction time	1 aircraft with 2 hr reaction time	At entry minus 24 hours aircraft can be released if CM is still targeted to the planned EOM.
Hickam AFB, Hawaii	1 dedicated aircraft with 1/2 hr reaction time and 1 nondedicated ARRS SAR alert (Apollo configured) aircraft	2 aircraft with 2 hr reaction time (1 dedicated and 1 non- dedicated)	2 aircraft and 1 backup to support EOM.

*Reaction times are designed to provide required support during first few hours after TLI. Once the mission trajectory has been established, more relaxed reaction times will be possible based on the minimum return time. These reaction times will be passed to recovery forces as they are identified.

Operation Order
COMHAWSEAFRON No. 339-71

2. End-of-Mission Hawaii Based Apollo Configured HC-130 Search and Rescue Aircraft Support

Voice Call	Task	Altitude	Station Assignment	Holding Instructions
Hawaii RESCUE ONE	Provide search-and-rescue capability in uprange portion of landing area	Flight Level 250	165 nm uprange, 100 nm normal to ground track, northwest	10 minute race track pattern perpendicular to CM ground track
Hawaii RESCUE TWO	Provide search-and-rescue capability in downrange portion of landing area.	Flight level 250	165 nm downrange, 100 nm normal to ground track, northwest	10 minute race track pattern perpendicular to CM ground track
Hawaii RESCUE THREE	Provide backup		Hickam AFB, Hawaii	

3. Primary Landing Area. (All flight operations for PRS based helicopters will be conducted under visual flight rules)

Voice Call	Task	Altitude	Station Assignment	Holding Instructions
RELAY	UHF/UHF and UHF/HF SSB relay of 296.8 MHz	8,000 ft	Overhead PRS no later than splash minus 20 min	Remain within 5 nm of station. Head toward predicted splash point at main parachute deployment
SWIM ONE	Conduct SARAH electronic search with 3 man UDT swimmer team and NASA representative embarked. CM flotation collar and life-raft on board.	5,000 ft	10 nm uprange of target point, 15 nm normal to ground track, northwest, no later than splash minus 20 min	Remain within 5 nm of station. Head toward predicted splash point at main parachute deployment
SWIM TWO	Same as SWIM ONE	5,000 ft	5 nm normal to ground track at the target point, southeast, no later than splash minus 20 min	Remain within 5 nm of station. Head toward predicted splash point at main parachute deployment

C-1-B-2 (CH-1)

Operation Order
COMHAWSEAFRON No. 339-71

Voice Call	Task	Altitude	Station Assignment	Holding Instructions
RECOVERY	Primary astronaut recovery helicopter	5,000 ft	10 nm down range of target point 15 nm normal to ground track, northwest, no later than splash minus 20 min	Remain within 5 nm of station. Head toward predicted splash point at main parachute deployment
PHOTO ONE	Photography and television helicopter. Photographers embarked as designated by NASA Recovery Team Leader.	1,000 ft or below	Overhead PRS initially, then proceed to DATUM as directed by CTG 130.1. Position as required for photo mission, but not to interfere with recovery helicopters or swimmers	On deck PRS. Launch immediately prior to CM entry as directed by CTG 130.1
PHOTO TWO	Backup photographic helicopter		Condition II standby on PRS	
Assigned When Launched	Backup SWIM/RECOVERY/RELAY helicopter		Condition II standby on PRS	
Assigned When Launched	Backup SWIM/RECOVERY/helicopter		Standby on PRS	

4. Weather Reconnaissance Aircraft

Type of Aircraft	Time Required	Purpose	Remarks
WC-130	From 3 days before recovery through recovery	Conduct long-range weather reconnaissance in EOM and adjacent areas or, for long duration earth orbital mission, the mid-Pacific recovery zone.	Time and number of flights will depend upon weather conditions (maximum of one flight per day)

C-I-B-3 (CH-1)

Operation Order
COMHAWSEAFRON No. 339-71

5. Logistic Support Aircraft

Event	Type of Aircraft	Time Required	From	To	Purpose	Remarks
A	SH-3G	Aproximately 3 days before recovery	Hickam AFB, Hawaii	PRS	Transport VIP, NASA, CINCPACFLT Band and Marine Corps Personnel	Approximately 37 personnel and 3300 pounds of baggage.
B	H-46	061900Z Aug (0900W)	Hickam AFB, Hawaii	PRS	Transport visiting officals.	Number to be determined.
C	HC-130	One pickup at flight crew retrieval plus 2 hours	Pickup at PRS	Hickam AFB, Hawaii	Capability to perform STAR (surface-to-air recovery) of news film and medical samples (two canisters)	
D	SH-3G	Approximately 080400Z Aug (071800W)	PRS	Hickam AFB, Hawaii (a/c to remain over night)	Transport lunar and medical samples, spacecraft data, film, NASA couriers and personnel to Hickam AFB, Hawaii	Minimum of 2 aircraft required. Estimate 2 people and 800 pounds of equipment are involved.
E	C-135 (ARIA)	When helicopters Event D arrive Hickam AFB, Hawaii	Hickam AFB, Hawaii	Ellington AFB, Texas as directed	Transport lunar and medical samples, spacecraft data, film and NASA personnel to Ellington AFB, Texas	
F	SH-3G	Approximately 081900Z Aug (080900W)	PRS	Hickam AFB, Hawaii and return	Transport lunar and medical samples, spacecraft data, film, astronauts and NASA personnel and equipment.	Number of aircraft as required.
G	C-141	When helicopters (Event F) arrive (approximately 081915Z Aug 080915W)	Hickam AFB, Hawaii	Ellington AFB, Texas	Transport lunar and medical samples, spacecraft data, film, astronauts and NASA personnel and equipment.	

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

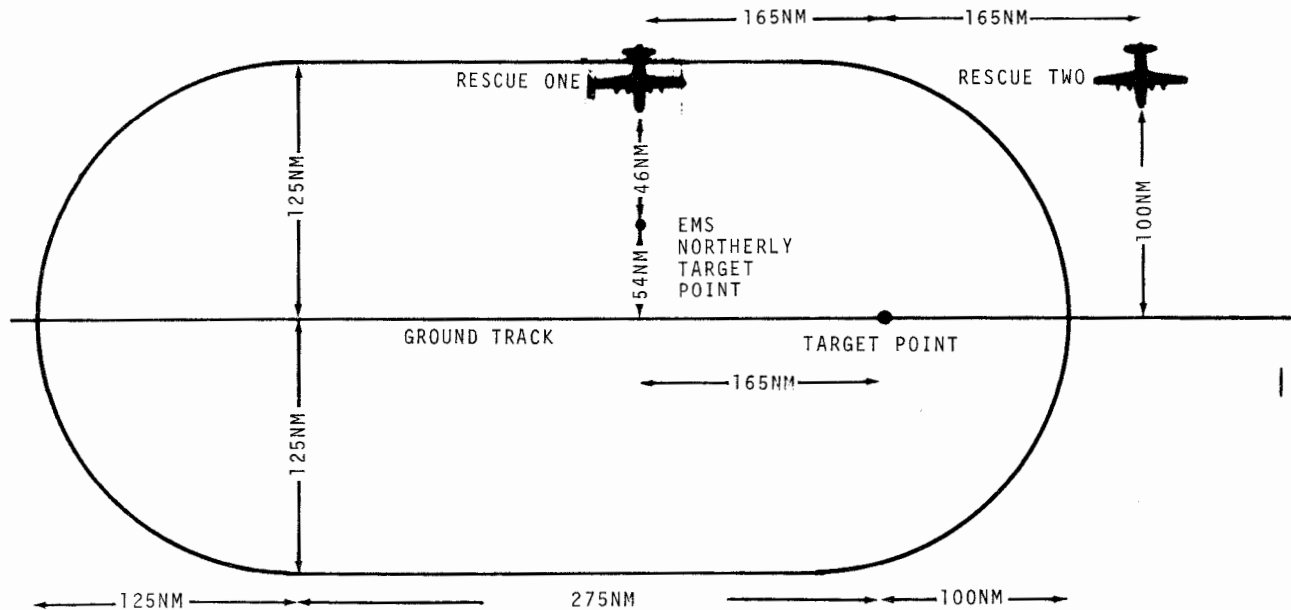
T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

C-1-B-4 (CH-1)

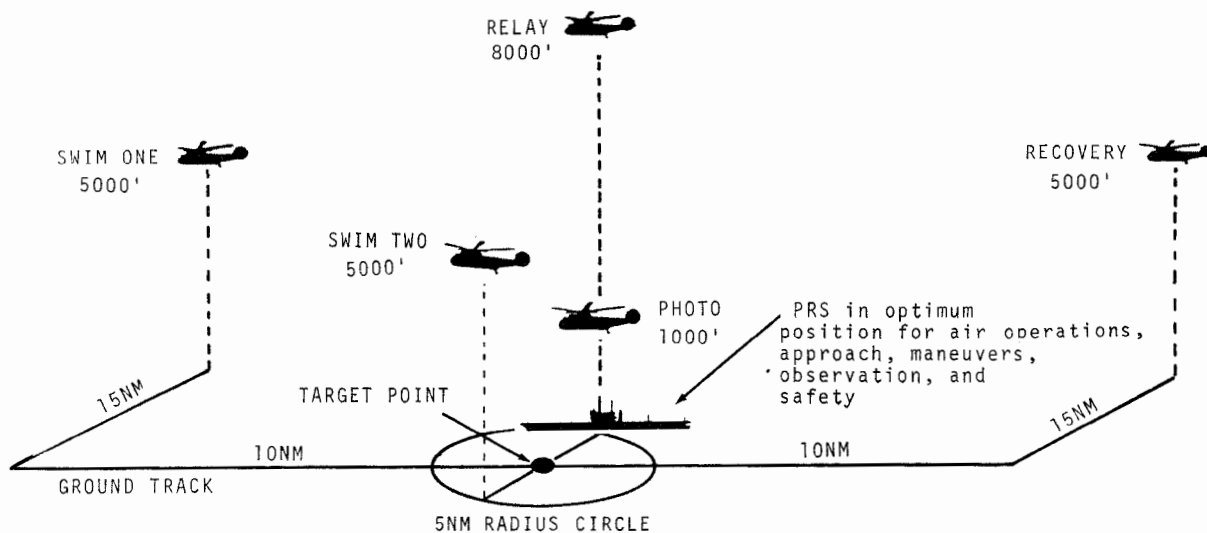
Appendix II to Annex C

Support Positioning Illustrations

1. End of Mission Primary Landing Area and Deep Space Secondary Landing Area

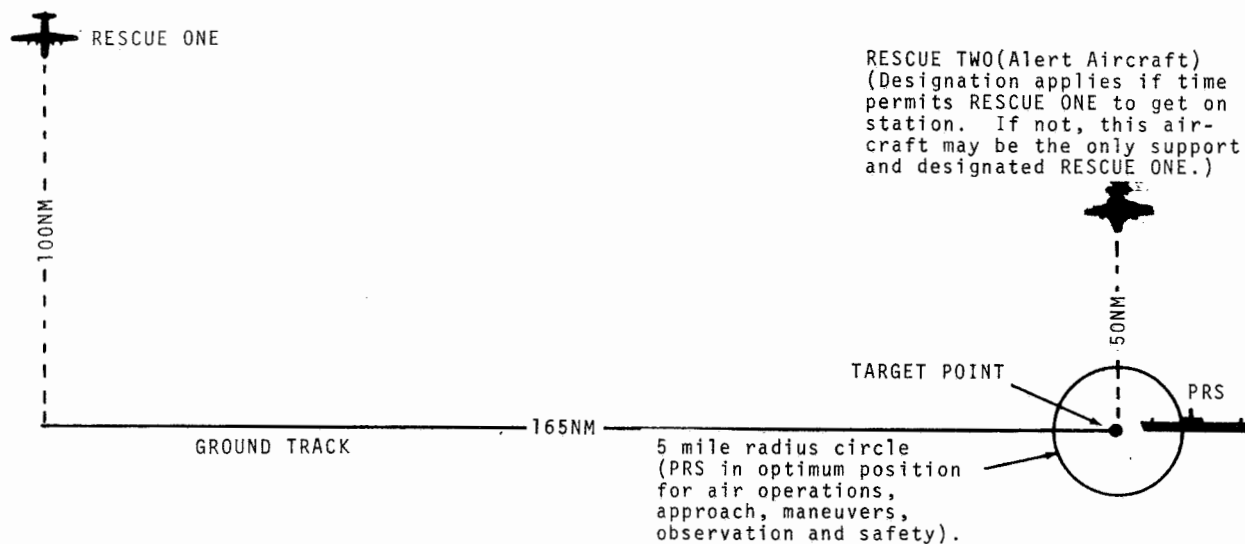


2. Primary Recovery Ship Aircraft Array

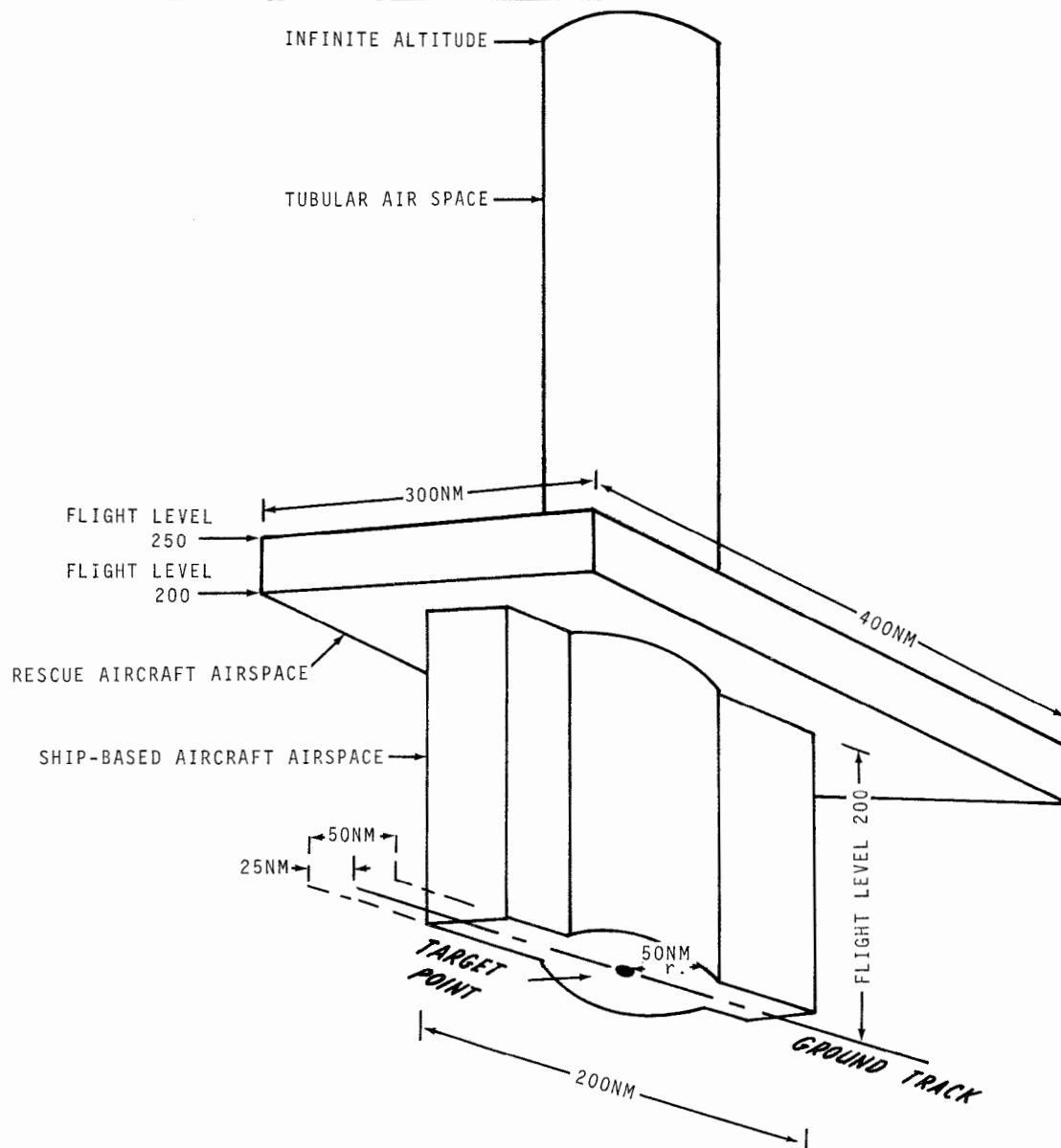


Operation Order
COMHAWSEAFRON No. 339-71

3. Secondary Recovery Ship Positioning and End of Mission Aircraft Array



4. Illustration of Splinter Shield Construction



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF-130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendix III to Annex C
Access and Retrieval Times

Phase of Mission	Area	Access Time (Hours)	Retrieval Time (Hours)
Earth Parking Orbit	Secondary Landing Area	6	Crew-42 CM-48
	Contingency Landing Area	48*	--
Deep Space	Secondary Landing Area	6	Crew-16 CM-24
	Contingency Landing Area	48*	--
End-of-Mission	Primary Landing Area	2	Crew-16 CM-24

*It is recognized and accepted by NASA that portions of the area lie outside the 48-hour capability of the aircraft.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson
R. T. TOLLESON

Captain, USN
Manned Spacecraft Recovery Officer

Operation Order
COMHAWSEAFRON No. 339-71

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Appendix IV to Annex C

Post Retrieval Operations

1. General. Post retrieval operations will be as described in Appendix VI, Annex C to reference (a) and as amplified herein.
2. Delivery of the Command Module. Upon arrival San Diego area, the CM will be offloaded at NAS North Island for deactivation.
3. Contingency Landing in the Pacific. In case of a contingency landing in the Pacific, procedures are outlined in Annex D.
4. Medical Support. Medical support for this mission will be in accordance with Annex H to reference (a), as supplemented by Annex H to this OPORDER.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:


R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

References: (a) COMHAWSEAFRON OPLAN 305-67
(b) DOD MGR for MSFS OPS and NASA MSC LRD Apollo Recovery Operational Procedures Manual, Revision B (16 Mar 70)

Annex D

Contingency Recovery Operations

1. General. Contingency recovery operations will be conducted in accordance with procedures set forth in Annex D to reference (a) as modified herein.

2. Contingency Recovery Responsibility. The PACOM (Pacific Command) area of responsibility for manned spacecraft recovery operations includes the Pacific and Indian Ocean areas east of 90° East longitude. The primary concern in the event of a contingency landing in the PACOM area is the rapid location and safe retrieval of the astronauts and CM (command module) and the collection, preservation and return of information relating to the recovery operation, test data and test hardware. TF 130 must be capable (under favorable operating conditions as defined in Annex A) of locating the CM and rendering first level medical aid to the astronauts as soon as possible but not later than 72 hours after the predicted landing time or notification that an unpredicted landing has occurred.

3. Contingency Support. The contingency landing area for this mission is that area outside of planned landing areas between 40° North and 40° South and is divided into four sectors as described in Annex A. Utilization of the ARRS SAR Alert System with assistance from normal operations ships or ships of opportunity provide the basis for contingency support.

a. ARRS SAR Alert. The ARRS SAR Alert System is organized to provide a capability of rendering immediate rescue service on a limited basis and full scale operations as soon as possible thereafter. The system requires that each ARRS unit maintain a minimum of one SAR alert aircraft on alert status in a constant state of readiness. The reaction time requirement is as soon as possible after notification to launch but not later than thirty minutes during daylight and forty-five minutes during darkness. Alert aircraft fuel loads are determined by unit commanders based on normal mission activity and local constraints within each area of operation. When a unit is limited by aircraft or aircrew resources, the alert commitment may temporarily be satisfied by an airborne aircraft performing another ARRS function from home base. In the event a unit cannot meet minimum alert requirements for a period of time, assistance is provided from another unit whenever feasible. ARRS units and locations are as follows:

36TH ARRSQ, Yokota AB, Japan

31ST ARRSQ, Clark AB, Philippines

76TH ARRSQ, Hickam AFB, Hawaii

79TH ARRSQ, Andersen AFB, Guam

b. ARRS SAR Alert (Apollo Configured). SAR alert (Apollo configured) is similar to ARRS SAR alert except that the alert aircraft is or can be configured to perform Apollo recovery support within designated reaction and access times. The aircraft is equipped with the ADDRIS (Aircraft Delivered Drift Reduction System), Apollo flotation collars and has a third pararescue-man assigned to the crew. Fuel loading requirements will be essentially the same as those for normal SAR alert until the aircraft is notified to launch on an Apollo recovery mission. Upon notification to launch, the aircraft will be serviced with additional fuel as required. SAR alert (Apollo configured) aircraft are not dedicated to NASA mission support and may perform other ARRS functions from home bases while in the SAR alert (Apollo configured) posture. ARRS SAR alert aircraft may not have sufficient flying hours/calendar days remaining prior to mandatory inspections to perform extended mission support.

c. Normal Operations Ship. The term "normal operations ship" refers to a U. S. Navy ship in the vicinity of a recovery area which may be called upon to provide recovery support for an impending landing or a landing that has already occurred. Until released from normal duties, the normal operations ship is not a part of the dedicated recovery force. Once committed to recovery support, the primary concern of the ship will be retrieval of the astronauts. However, if the ship is near or in port and does not possess CM retrieval capability but is capable of accepting the NASA provided crane, it may be directed to enter port to install a crane prior to proceeding to the landing point. Another possibility is that one ship would retrieve the crew and at a later time another would retrieve the CM. This decision will be based on the immediate situation.

d. Ship of Opportunity. A ship of opportunity is a ship, other than a U. S. Navy ship, operating in the vicinity of the recovery operation which has the capability of astronaut and/or CM recovery.

4. Contingency Search and Recovery Procedures. In the event of a contingency landing in the PACOM area, TF 130 recovery operations will involve location of the CM, provision of on-scene assistance, maintenance of contact and astronaut and CM retrieval.

Operation Order
COMHAWSEAFRON No. 339-71

a. Location. As soon as the CM has been committed to a landing, it is necessary to establish the landing point as rapidly as possible in order that recovery forces can accomplish their mission. All information pertinent to establishing the landing point which is available in the MCC (Mission Control Center) will be evaluated and a probable landing point will be calculated and passed to CTF 130. Factors which may be considered include tracking data, telemetry information, voice contact with the astronauts, etc. Upon establishment of this probable landing point, CTF 130 will direct the launch of appropriate search aircraft toward the probable landing point. These search aircraft will conduct an electronic search as they proceed. Upon receiving a signal from the recovery beacon on the CM they will continue to home on the signal until visual contact is established.

b. On-Scene Assistance and Maintenance of Contact. As soon as a search aircraft has located the CM, if there are no surface units in the vicinity and assuming that reasonable weather conditions (wind and sea state) exist, pararescue personnel should parachute to the CM and install the flotation collar. In the event that the locating aircraft does not have pararescue personnel, or operating conditions do not permit their deployment, this fact will be reported to CTF 130 and contact will be maintained with the CM to the limit of the aircraft's endurance. Additional aircraft will be launched to provide on-scene assistance and maintenance of contact until the arrival of a recovery ship on the scene.

c. Retrieval. NASA contingency recovery concepts do not require prestaging recovery ships to support the actual retrieval phase of contingency recovery operations. CTF 130 will utilize available naval or merchant shipping to effect CM and astronaut recovery. A detailed discussion of contingency recovery procedures is contained in Section 3 of reference (b).

5. Communications. Contingency recovery communications will be in accordance with Annex E. In view of the national interest in Project Apollo, should a contingency landing occur, it is essential that CTF 130 be kept advised on a continuous basis of the current status of recovery operations including action being taken, planned action and deviations from planned action.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:



R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Annex E

Communications

1. General. The purpose of this Annex is to provide communications guidelines for Apollo 15 recovery operations in the PACOM (Pacific Command) area.

a. Communications will be in accordance with NWP 16 (B) and appropriate joint, allied, USAF and USN publications. NWP 16 (B) is effective throughout as applicable to the existing situation unless modified by this Annex.

b. Where conflicts arise between this operation order and reference (a), this operation order takes precedence.

c. Communications Plans for Apollo 15 recovery operations support three basic situations:

(1) Recovery communications plan for the surface recovery forces

(2) Recovery communications plan for the land-based search group

(3) Recovery communications plan for a contingency landing

Communications Plans for the above recovery situations are in Appendices I through III.

d. All information concerning the recovery operations of Apollo missions is UNCLASSIFIED.

e. CTF 130 (Commander Manned Spacecraft Recovery Force, Pacific) will be located in the Pacific RCC (Recovery Control Center) from T-24 hours until the completion of the recovery mission.

f. When referring to messages originated by or sent from non-Navy sources within the Department of Defense or other government agencies, the originator's reference number and the date-time group shall be used followed by the month and the year.

Example: NASA MSC LRD MSG 8204-257/122055Z July 71.

g. Communications facilities processing TF 130 messages shall insure that their personnel are advised of and have access to information contained in reference (a), this operation order and other pertinent plans, orders and instructions promulgated by cooperating and supporting commands and agencies. Cooperating and supporting commands and agencies are listed in Annex N of reference (a).

h. The NCS (National Communications System) restoration priority 3(a) is assigned to all DCS (Defense Communications System) manned spacecraft recovery circuits during the on-call and test periods. At T-48 hours, the restoration priority is automatically raised to 1(f) until the mission is completed. Nothing in this operation order precludes normal restoration procedures to insure continuity of communications or quality engineering improvements of circuitry.

i. Entry into the DOD (Department of Defense) voice communications systems for the transmission of urgent operational traffic is authorized. For this purpose, existing priority codes will be used with IMMEDIATE precedence authorized.

j. Should additional circuits be required during the recovery mission, CTF 130 will request them from the DOD MGR (Department of Defense Manager for Manned Space Flight Support Operations) who will validate these requirements to the DCA (Defense Communications Agency). DCA PAC (DCA Pacific) will coordinate activation of these additional requirements with the DCA.

k. Circuit discipline must be maintained at all times. During recovery operations CTF 130 is the net controller for the command and control circuits. The on-scene commander, task group commander and CTF 130 will be the only users of the circuit unless relay services are required. All other stations shall refrain from transmitting unless invited to do so by CTF 130.

l. Circuits shall be activated expeditiously. Activation times for all circuits will be promulgated by message. Inability to meet circuit activation schedules shall be reported to CTF 130 immediately.

m. Communications shall follow the command structure as described in the task organization.

n. CTF 130 will coordinate frequency shifts with all stations concerned.

Operation Order
COMHAWSEAFRON No. 339-71

o. All circuit outages or other communications problems affecting the recovery mission shall be reported immediately to CTF 130 by whatever means available.

p. At no time except during an actual aircraft emergency will any ship transmit on 243.0 MHz.

q. At the completion of the mission, all stations shall insure that all traffic has been receipted for before requesting permission to secure from a particular circuit.

2. Emission Control. The only restrictions on electro-magnetic radiations are concerned with the protection of or silence on dedicated recovery frequencies. A frequency protection criteria message will be promulgated before the mission.

3. Authentication. All units engaged in Apollo recovery operations are exempt from authentication requirements. This exemption also applies to Apollo messages sent on other non-Apollo circuits.

4. Frequency Plan and Guard Assignments. The frequency plan and guard assignments are in Appendix IV.

5. Call Signs. Special descriptive and UNCLASSIFIED Apollo voice call signs will be used in accordance with Annex E of reference (a) and Appendix V to this Annex.

6. Fleet Broadcast. TF 130 ships shall copy the appropriate fleet broadcast and inform cognizant fleet commanders if it becomes necessary to shift broadcast.

7. ORESTES. Exclusive frequencies for special ORESTES termination may be established, if desired, by task group commanders. Arrangements may be made by direct coordination with the NAVCOMMSTA concerned.

8. Ship-to-Shore CW. Should a recovery ship lose communications with CTF 130 on the command and control circuits, the appropriate ship-to-shore CW circuits should be utilized.

9. SAR (Search and Rescue) Communications. SAR communications shall be in accordance with NWP 37 (A), NWP 16 (B) and appropriate SAR Area Coordinator's instructions.

10. Astronaut Communications Recording. Astronaut communications recording will be in accordance with Appendix VI:

11. Press Communications. Press communications will be in accordance with Appendix VII.

12. Amateur Radio Operations. Due to the unique status of afloat forces engaged in Apollo recovery missions, CINCPACFLT has authorized amateur radio operations from Apollo primary recovery ships. These operations are authorized from PRS departure from Pearl Harbor for the recovery area until return to the first port after recovery and will be coordinated with all communications functions on board to insure operation on a non-interfering basis.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendices:

- I - Recovery Communications Plan for Surface Recovery Forces
- II - Recovery Communications Plan for the Land-based Air Search Group
- III - Recovery Communications Plan in Support of a Contingency Landing
- IV - Frequency Plan and Guard Assignments
- V - Call Signs
- VI - Astronaut Communications Recording
- VII - Press Communications

Appendix I to Annex E

Recovery Communications Plan for Surface Recovery Forces

1. Voice Communications. To provide the required voice communications for the surface recovery forces, the following circuits will be utilized:

a. Command and Control

(1) The primary means of voice communications between CTF 130 and the surface recovery forces throughout the mission shall be the ~~high-frequency~~ ^{HF} Command and Control voice circuit designated circuit ALFA.

(a) PRS Voice Communications. This circuit will consist of an HF (high-frequency) SSB (single-sideband) full duplex circuit terminated in AN/FTA-15A's on the PRS and at the RCC Pacific and should be available at remote locations which will provide the talker an unobstructed view of all recovery operations. This circuit will be designated "PRS ALFA."

The Hawaii HF terminal for the above circuit will be located at NAVCOMMSTA HONOLULU. Circuit control will be exercised by NAVCOMMSTA HONOLULU. During scheduled ATS-Satellite time a PRS Command and Control circuit may be activated in accordance with subparagraph 1.c.

(b) SRS Voice Communications. CTF 130 will key two transmitters at NAVCOMMSTA HONO in support of the HF circuit between the RCC Pacific and the SRS. This circuit will be designated "SRS ALFA".

(2) Task Group Common

(a) The primary means of communications between the task group commander and the task group for task group coordination is a high frequency single sideband voice circuit. This circuit is designated CIRCUIT CHARLIE.

(b) Fleet common may be used as primary task group common and CIRCUIT CHARLIE as secondary when ships are within UHF range.

(3) The above Command and Control circuits are depicted in Tab A. Frequencies for these circuits are listed in Appendix IV of this Annex.

b. NASA Voice Communications

(1) The primary means of voice communications between NASA engineering, medical and public affairs personnel at the ROCR (Recovery Operations Control Room) at MCC Houston, RCC Pacific and the PRS shall be via the NASA PRS Coordination Circuit. This circuit shall be available for remote termination aboard the PRS at the following locations:

(a) NASA Office Spaces (CIC/HDC/SACC area). Required during simulation exercises, actual recovery and throughout the mission as scheduled. Circuit should have speaker monitor and handset near plotting table.

(b) CM Retrieval Area. A long lead handset should be available to permit the user to view retrieval operations. This remote station is required during simulation exercises and actual recovery.

(c) Medical (Three Instruments). The spaces where the postflight medical examinations will be conducted. Required during simulation exercises and actual recovery.

(2) The NASA PRS Coordination Circuit will be activated on a scheduled basis. A typical schedule would be as follows:

(a) On launch day from T-30 min through TLI + 10 minutes for a normal launch

(b) One 1-1/2 hour period daily between 2030Z (1030W) and 2200Z (1200W)

(c) One hour prior to entry interface until twelve hours after recovery

(d) During PRS simulations with the MCC

In the event the NASA PRS Coordination Circuit is temporarily inoperative, NASA personnel with urgent traffic may desire to share use of the Command and Control voice circuit. This may be done with the permission of the task force commander and on a not-to-interfere basis with Command and Control communications.

(3) The NASA PRS Coordination Circuit, depicted in Tab B, shall be activated via the ATS-1 satellite during scheduled times in accordance with paragraph 1.c. During contingencies or non-scheduled satellite time, circuit NOVEMBER will be activated if the need should arise.

(a) ~~Circuit~~ NOVEMBER will consist of an HF SSB full duplex circuit terminated in AN/FTA-15A's on the PRS and at the RCC Pacific. Bridging of this circuit will be accomplished at the RCC Pacific to facilitate a three-way conference arrangement between ROGR Houston, RCC Pacific and the PRS. Frequencies for this circuit will be taken from the circuit ALFA and circuit HOTEL listings in Appendix IV of this Annex.

(4) It is possible that the NASA surgeon on board the recovery helicopter will require a direct circuit with the NASA medical personnel on board the PRS. Any existing operational circuit would be suitable for this purpose and should be provided for use on a not-to-interfere basis with operational communications.

(5) The following circuits should be available in the NASA office space, with speakers and handsets:

- (a) Command and Control voice circuit
- (b) NASA PRS Coordination circuit
- (c) Astronauts Voice Circuit (Handset required during simulations only)
- (d) Helicopter Control Circuit (Handset required when simulating helicopters only)

c. Satellite Communications

(1) One satellite system will be available for use aboard the PRS during Apollo 15.

(a) ATS-1 (Application Technology Satellite No. 1)

1. The ATS-1 is in near geostationary orbit at 151° west longitude and will be within view of the PRS during the Apollo 15 mission. The satellite is controlled by the NASA ATS Operations Center at Goddard Space Flight Center. This satellite is a VHF/SHF transponder type; operations in support of Apollo 15 will be VHF only, on 149.22 MHz uplink and 135.60 MHz downlink. The VHF transponder will provide one voice channel to CTF 130 for eight hours per day and twelve hours on recovery day. During these periods, the ATS circuit will be used for NASA PRS Coordination or Command and Control purposes as designated by CTF 130.

The ATS-1 terminal on board the PRS will be housed in a hut installed on the flight deck and will be operated and maintained by representatives of the Goddard Space Flight Center. Remoting of voice lines on the PRS will be via the ship's normal patching system.

(b) ATS-1 satellite circuits are depicted in Tab C.

d. Presidential/VIP Calls. Shortly after the flight crew is aboard the PRS, it is likely that they will receive a congratulatory call from the president and/or other high government officials. This call would take place after the astronauts are in medical isolation, therefore, the existing NASA PRS Coordination Circuit would be used for this call. The call will be coordinated by CTF 130 communications personnel in conjunction with the communications representatives at Cape Kennedy and the White House. Circuit configuration will be promulgated by CTF 130 to the PRS in sufficient time for communications personnel aboard the PRS to prepare for the call.

e. Astronaut Voice Circuit

(1) The Astronaut Voice Circuit, 296.8 MHz (Primary) and 259.7 MHz (Secondary) will be used for coordination of astronaut recovery.

(a) If problems are encountered on 296.8 MHz, the astronauts will switch to their secondary transceiver and operate on 259.7 MHz.

(b) In the event of failure of normal VHF equipment in the CM (296.8 MHz and 259.7 MHz), or for emergency actions, the astronauts will use their survival radios on 243.0 MHz.

(c) Recovery forces will attempt initial contact with the CM using the primary frequency 296.8 MHz. If contact is not made upon visual sighting of the CM, voice contact will be attempted on secondary frequency 259.7 MHz.

(d) Voice contacts on the emergency frequency 243.0 MHz will be immediately reported to CTF 130.

(2) Relay aircraft will provide UHF/HF SSB relay of the Astronaut Voice Circuit to CTF 130 and CTG 130.1. The HF portion of the relay path is designated circuit ROME0 and is depicted in Tab D. Frequencies for circuit ROME0 will be taken from the appropriate section of Appendix IV.

f. Ship-to-Air and Air-to-Air Communications. A supporting communications plan will be promulgated by CTG 130.1 to provide circuits and frequencies to be used with PRS aircraft, including provisions for automatic relay of the astronaut voice circuit to the PRS when the recovery takes place out of normal UHF range.

2. Teletype Communications. To provide the required record communications capability for the PRS the following teletype circuits will be utilized from the normal PRS shore termination tone package:

- a. Command and Control Teletype. A full duplex circuit between CTF 130 and the PRS.
- b. Press. A full duplex circuit between NCS HONO and the PRS. This circuit is described in detail in Appendix VII of this Annex.
- c. The above teletype circuits are depicted in Tab E.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

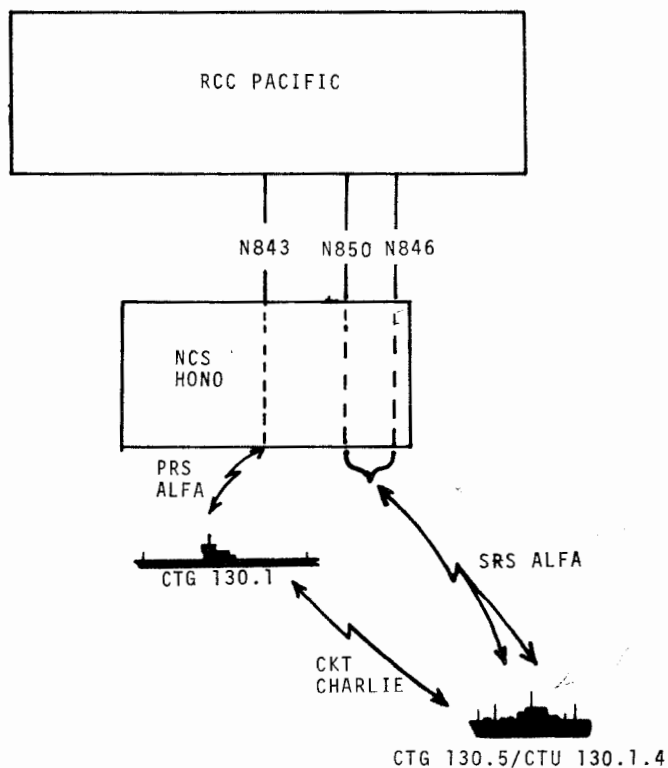


R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Tabs:

- A - Command and Control Voice Circuits
- B - NASA PRS Coordination Circuit
- C - ATS Satellite Communications
- D - Circuit ROMEO
- E - Teletype Circuits

Tab A to Appendix I to Annex E
Command and Control Voice Circuits



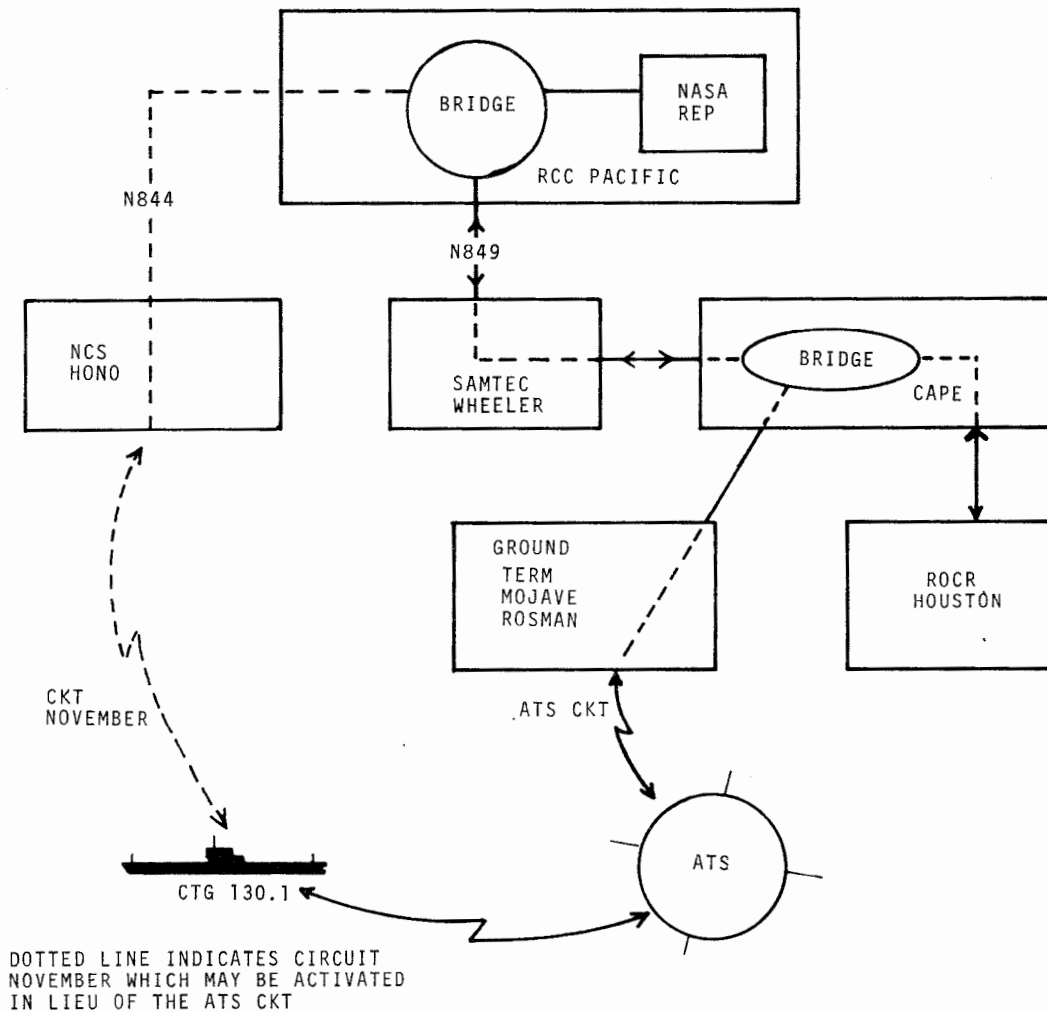
T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

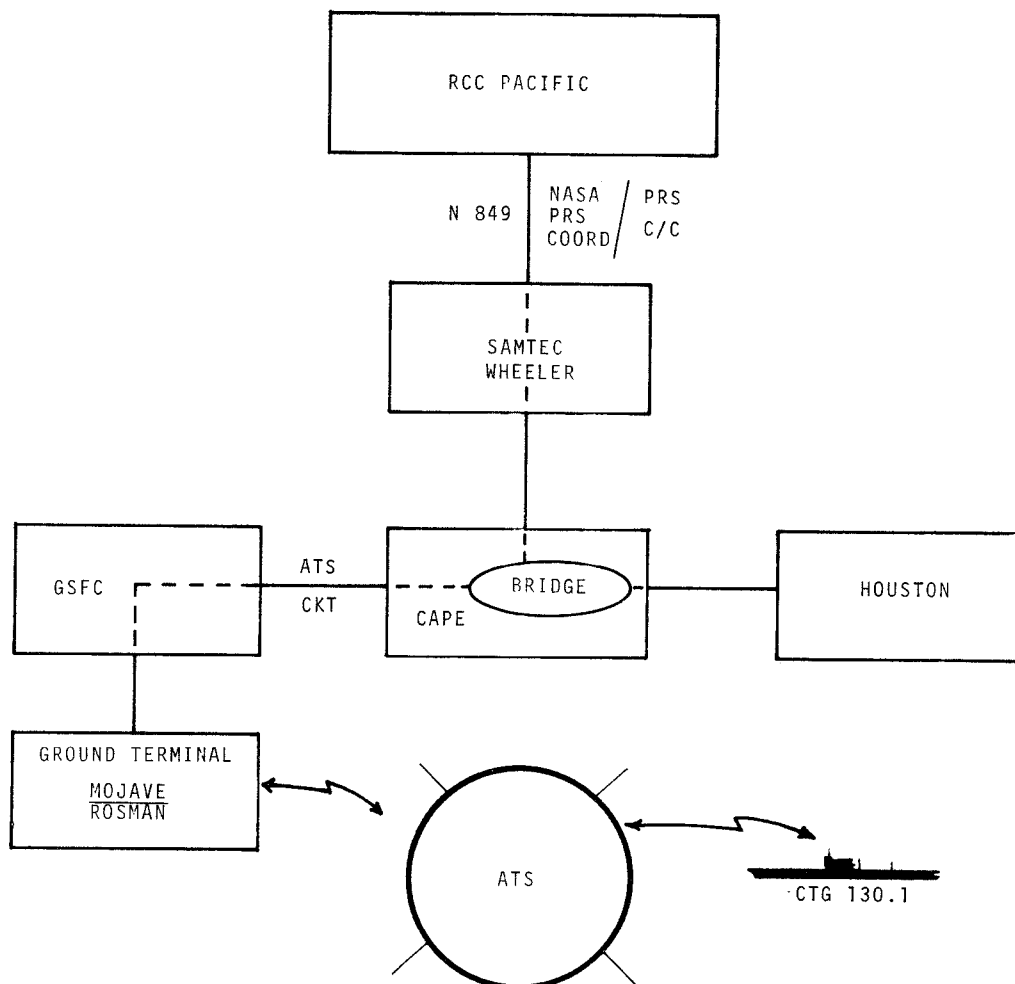
Tab B to Appendix I to Annex E
NASA PRS Coordination Circuit



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:
R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Tab C to Appendix I to Annex E
ATS Satellite Communications



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

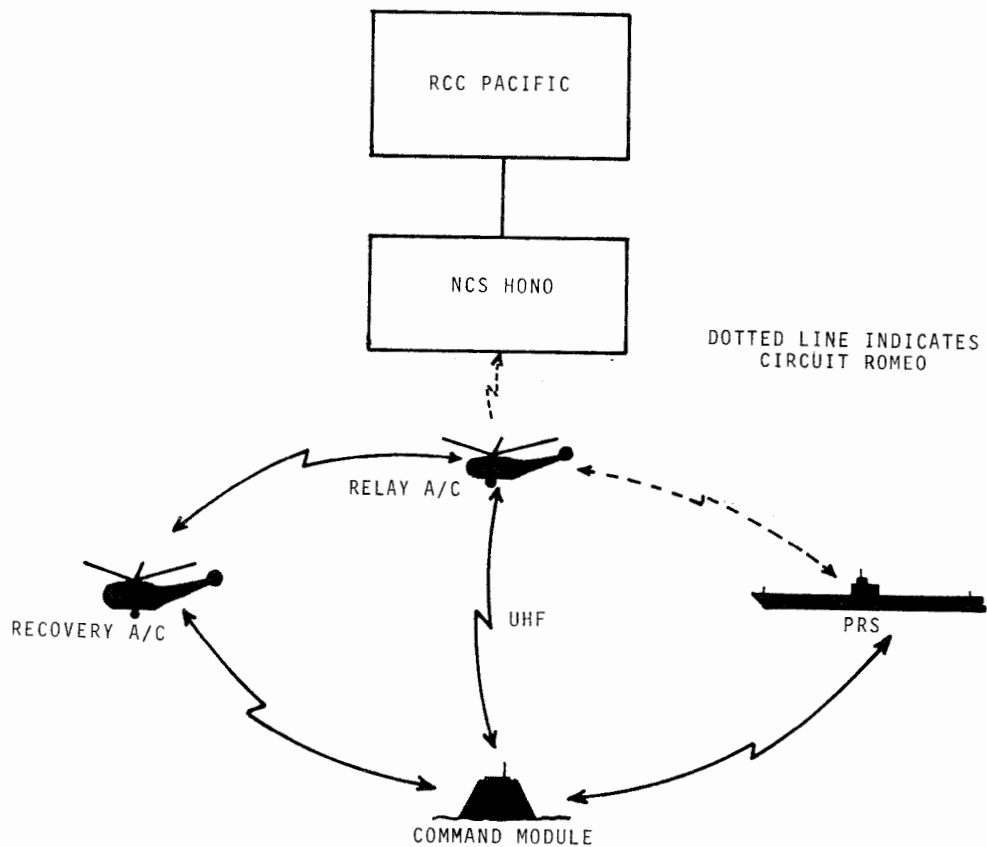
R. T. Tolleson

R. T. TOLLESON
Captain, USN

Manned Spacecraft Recovery Officer

Tab D to Appendix I to Annex E

Circuit ROMEO



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

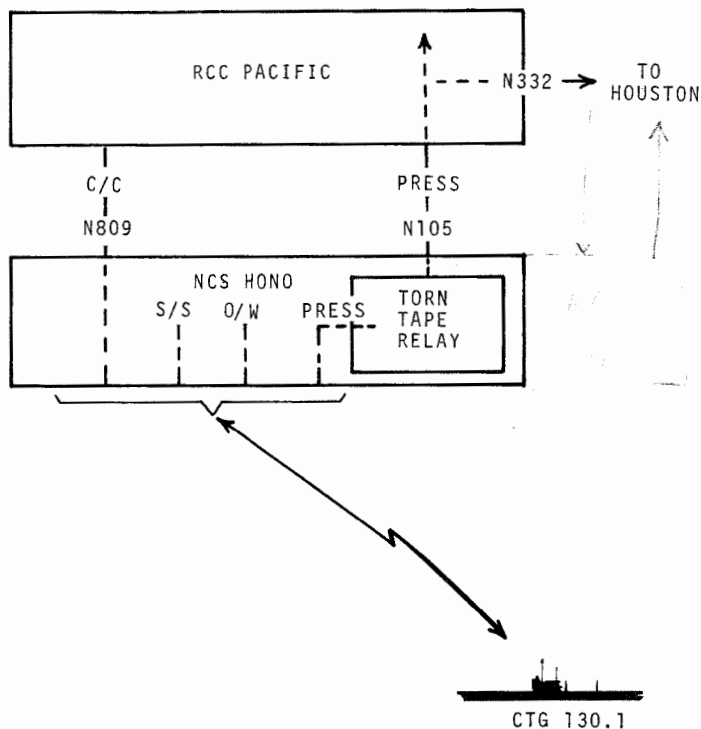
R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Tab E to Appendix I to Annex E

Teletype Circuits

~~16 CH. TWINNED TO~~
8 CH MUX TONE PKG.
7 CH MUX 4 CH



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated;

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendix II to Annex E

Recovery Communications Plan for the Land-Based Air Search Group

1. General.

a. The communications plan in support of the land-based air search group provides communications between CTF 130, CTG 130.4 and SRCCs (Sub-Recovery Control Centers).

b. The SRCCs control the land-based aircraft that support Apollo recovery operations in the end-of-mission landing area, secondary landing area and in the event of a contingency landing.

2. Sub-Recovery Control Centers. SRCCs located at the following locations will support recovery operations in the PACOM (Pacific Command) area:

a. Hickam Air Force Base, Hawaii

b. Andersen Air Force Base, Guam

3. SRCC COMMON

a. The primary means of communications between CTF 130/CTG 130.4, SRCC Guam at Andersen AFB, and land-based aircraft in the recovery area shall be by HF SSB voice radio. This circuit is designated circuit HOTEL and is depicted in Tab A.

b. Communications with TG 130.4 units at Hickam AFB, Hawaii, will be via three direct lines connecting the RCC Pacific with the 41ST ARRWG (41ST Aerospace Rescue and Recovery Wing), the 76TH ARRSQ (76TH Aerospace Rescue and Recovery Squadron) and the Pacific Air Force switchboard at Hickam AFB.

c. CTF 130 will key two transmitters at NAVCOMMSTA HONO on circuit HOTEL.

d. Kwajalein Missile Range will act as a voice relay station on circuit HOTEL when required. A voice circuit between RCC Pacific and Kwajalein Missile Range is available as a backup for circuit HOTEL, and is designated N806.

e. The SRCC at Andersen AFB, Guam is equipped with two HF SSB transceivers for use on circuit HOTEL. A voice circuit between RCC Pacific and the SRCC at Andersen AFB, Guam is available as a backup for circuit HOTEL, and is designated N807.

4. Circuit INDIA. This air-to-ground circuit is available for use between surface recovery forces and aircraft when required for either end-of-mission communications or special air/ground operations such as air drops, etc.

5. Message Routing Instructions. Messages addressed to land-based air search group units will be routed as follows:

a. TU 130.4.1 - 76TH ARRS Hickam AFB/RUHHABA

b. TU 130.4.2 - 79TH ARRS Andersen AFB, Guam/RUHJOFA

Authenticated:

R. T. Tolleson

R. T. TOLLESON

Captain, USN

Manned Spacecraft Recovery Officer

T. B. HAYWARD

Rear Admiral, USN

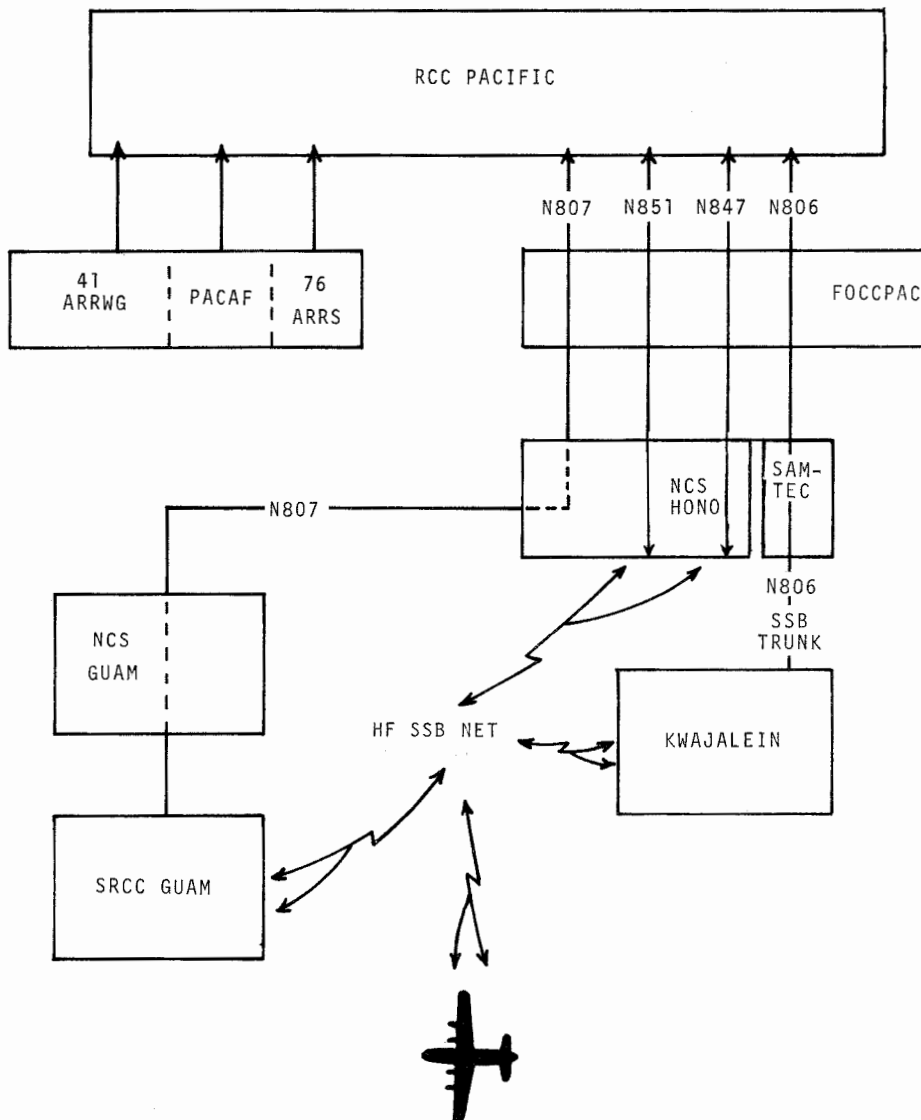
Commander Hawaiian Sea Frontier and

Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Tab:

A - SRCC Common Circuit HOTEL and Associated Circuits

Tab A To Appendix II to Annex E
SRCC Common Circuit HOTEL and Associated Circuits



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:
R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Appendix III to Annex E

Recovery Communications Plan in Support of a Contingency Landing

1. General

- a. The contingency recovery plan is in Annex D.
- b. The recovery communications plan for a contingency landing is in Appendix IV to Annex E of reference (a).
- c. A contingency landing is a landing in an area other than the primary or secondary landing area. The CM (command module) could land anywhere along the ground track.

2. Forces

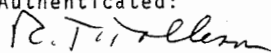
- a. In the event of a contingency landing, CTF 130 will utilize the nearest land-based air search unit or element and the closest ship. Additional military forces may be requested from the assets of regional SAR commanders or other commanders as appropriate.
- b. Assistance may also be requested from allied military services, other foreign military services, U. S., allied and foreign merchant ships. Initial contact with merchant ships will be made on 500 kHz CW and/or 2182 kHz voice.

3. Communications

- a. The communications plans, frequencies and assets dedicated to support the secondary landing areas and the land-based air search recovery plan will be available to support a contingency landing. Detailed circuit descriptions are in Appendix I and II and the Tabs thereto.
- b. The communications facilities of DCA-PAC will be made available and additional circuits will be allocated to CTF 130 as required.
- c. U. S. and foreign commercial facilities may be used at the discretion of the element commander.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:


R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendix IV to Annex E
Frequency Plan and Guard Assignments

CKT	FREQUENCY (all kHz except as noted)	PURPOSE	CTF 130	CTG 130.1	CTU 130.1.4/CTG 130.5	CTG 130.4	TG 130.4	KWAJ
PRS ALFA and SRS ALFA	(a) 4021.5 ✓	Command/ Control	G	X	W			
	** (b) 4705.5 ✓							
	(c) 5220 ✓	HF SSB Voice						
	(d) 5915 ✓							
	** (e) 6691.5 ✓							
	(f) 7363.5 ✓							
	(g) 7454.5 ✓							
	(h) 8710 ✓							
	(i) 9003.5 ✓							
	(j) 9121.5 ✓							
	(k) 11196.5 ✓							
	(l) 11563 ✓							
	(m) 12014 ✓							
	(n) 13238.5 ✓							
	(o) 15062.5 ✓							
	(p) 15072.5 ✓							
	(q) 17986.5 ✓							
	(r) 20491.5 ✓							

Legend: G-Net Control; X-Guard; W-When Required; ** Initial Contact Frequencies

CKT	FREQUENCY (all kHz except as noted)	PURPOSE	CTF 130	CTG 130.1	CTU 130.1.4/CTG 130	CTG 130.4	TG 130.4	KMAJ
HOTEL (SEE NOTE 1)	(a) 4740.5 (4739) (b) 6698.5 (6697) (c) 6745 (6743) (d) 8977.5 (8976) ** (e) 8981.5 (8980) (f) 9040.5 (9039) (g) 11199.5 (11198) (h) 11215.5 (11214) (i) 11600 (11598) (j) 15088.5 (15087) ** (k) 15548.5 (15547) (l) 17986.5 (17985) (m) 18408.5 (18407) (n) 22726.5 (22725) (o) 22738 (22736)	SRCC COMMON HF SSB VOICE	X			G	X	X
INDIA	(a) 142.5 MHz (b) 149.4 MHz ** (c) 264.2 MHz (d) 304.2 MHz (e) 3102 kHz (f) 5072.5 kHz	Air to Ground Voice		W	W		W	
CHARLIE	(a) 3089.5 (3088) (b) 4556.5 (4555) ** (c) 8225.5 (8224)	TG COMMON		G	W			
ROMEO	** (a) 5950 (5948) (b) 6694.5 (6693) (c) 11218.5 (11217)	UHF/HF Voice On-Scene	X	G				

Legend: G-Net Control; X-Guard; W-When required; **Initial contact frequencies

Note 1: The communications equipment installed in the land-based aircraft is limited to tuning the suppressed carrier in whole kilohertz steps only. Therefore, when using frequencies H(c), H(i), H(o) and R(a) the suppressed carrier frequency used by all stations must be 2 kHz below the assigned frequency.

Example: When utilizing frequency H(c), 6745 kHz, all stations must use 6743 kHz as the suppressed carrier frequency. This procedure is in accordance with JANAP 195(H), Chapter 6, paragraph 601B.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated.

R. T. Tolleson

R. T. TOLLESON

Captain, USN

Manned Spacecraft Recovery Officer

CROWN ⇒ "WHITE HOUSE"

Operation Order
COMHAWSEAFRON No. 339-71

Appendix V to Annex E

Call Signs

1. Task Force Voice Call Signs

a. Task Force voice call signs are listed below:

<u>Activity</u>	<u>Command</u>	<u>Collective</u>
CTF 130	PACIFIC CHIEF	
TF 130		PACIFIC TRIBE
CTG 130.1	PRIMARY LEADER	
TG 130.1		PRIMARY GROUP
CTG 130.4	PACIFIC RESCUE	
TG 130.4		RESCUE GROUP

b. Ships will use ship's name as their voice call signs, e.g., USS OKINAWA (LPH 3) - "OKINAWA"; USS KAWISHIWI (AO 146) - "KAWISHIWI".

c. Surface on-scene-commander is ---"SURFACE BOSS."

d. SRCC voice call signs will consist of base plus the word "LEADER", e.g., "GUAM LEADER".

e. Land-based aircraft voice call signs will consist of the aircraft's geographical location of base, type of mission and number, e.g., --- "HAWAII RESCUE ONE", "GUAM RESCUE ONE".

f. PRS based aircraft voice call signs will consist of the aircraft's type of mission and number but omit base, e.g., --- "RELAY", "RECOVERY", "PHOTO", "SWIM ONE" and "SWIM TWO".

g. On-scene aircraft collective is --- "AIR GANG".

2. Special Voice Calls. Following are voice calls used during circuit checks and for communication coordination between Cape Kennedy, Houston, RCC Pacific and various remote stations aboard the PRS:

<u>Location/Function</u>	<u>Example of Voice Call</u>
a. CTF 130 Communication Coordinator	"PACIFIC RADIO"
b. DOD Communication Coordinator at Cape Kennedy	"CAPE OSBORN"
c. DOD Communication Coordinator at MCC Houston	"HOUSTON OSBORN"
d. PRS Remote Station in Radio Central	"OKINAWA RADIO"
e. PRS Remote Station in sick bay	"OKINAWA MEDICAL"
f. PRS ATS Terminal	"OKINAWA ATS"

Operation Order
COMHAWSEAFRON No. 339-71

3. Shore Facilities Call Signs. The following voice call signs will be used when communicating with shore communications facilities:

NCS HONO

"HAWAII RADIO"

KWAJALEIN MISSILE RANGE

"KWAJ RELAY"

4. CW Call Signs. Task force organization, ship and shore station CW call signs are in ACP's 112, 113 and 100 respectively.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendix VI to Annex E

Astronaut Communications Recording

1. Astronaut Voice Communications. The astronauts' capability to transmit and receive on UHF (296.8 MHz and 259.7 MHz) exists from launch until approximately 36 hours after spacecraft landing.
2. CM Beacon. The CM Beacon (243.0 MHz) will be activated immediately prior to splashdown.
3. Action. The primary recovery ship will monitor and record astronaut voice communications and CM beacon transmissions from recovery aircraft launch to crew retrieval. Secondary recovery ships will monitor and record astronaut voice communications and CM beacon transmissions from CM entry until crew retrieval if they have available equipment. The tapes will be turned over to the NASA recovery team leader.
4. Caution. At no time will recovery forces attempt to talk to the astronauts unless they are engaged in actual recovery operations.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Appendix VII to Annex E

Press Communications

1. General. News media representatives will be embarked in ships of TF 130 as outlined in Annex P of reference (a). This appendix describes the manner in which the news pool requirements are fulfilled.

2. News Pool/TV Circuits

a. Teletype Circuits. News media representatives aboard the PRS will require a teletype channel for relay of their written pool copy to the Apollo News Center at Houston. This requirement will be fulfilled by a full-duplex circuit from the PRS to NAVCOMMSTA HONO from the normal PRS MUX shore termination. This circuit will operate on a torn-tape relay basis at NAVCOMMSTA HONO with press traffic entered at that point into the press teletype network depicted in Tab A. This circuit will be utilized for press pool copy only and traffic will be sent using the format contained in paragraph 3 below. Transmission times will be twice daily for one hour periods, 1000W to 1100W and 1900W to 2000W. On recovery day, transmissions will be scheduled from three hours prior to reentry until three hours after the flight crew is aboard. Shipboard communications personnel will not accept handwritten press pool copy. All press pool copy will be inspected at NAVCOMMSTA HONO to insure readability prior to retransmission. The on-board NASA PAO representative should be kept advised of HF circuit conditions to permit briefings of the pool representatives on possible delays to be expected, best transmission periods, etc.

b. Voice Circuit. The news pool and TV personnel will require a ship-shore voice circuit. This requirement will be satisfied by the agencies bringing aboard, with the Commanding Officer's permission, portable communications equipment compatible with the ship's equipment and limited in power to one kilowatt peak envelope power. Special frequencies will be obtained, by the agencies concerned, from the Federal Communications Commission. The equipment will be located so as to provide the pool/TV personnel with a reasonable vantage point. The location will be as agreed to by the ship's commanding officer. The news pool/TV personnel will provide for their own shore terminal and will assume full responsibility for the operation and reliability of their circuit. They will also be required to cease transmission on any frequency which, in the opinion of the ship's communications officer, will interfere, or is interfering, with operational communications.

c. Sound Powered Phone Circuit. A sound powered phone circuit will be required with talk-and-monitor capability at the following locations:

- (1) NASA office space in CIC/HDC/SACC
- (2) TV van
- (3) Newsroom
- (4) TV commentators' positions (3 locations)
- (5) Radio commentators' positions

This circuit will be used by the NASA PAO representative in narrating recovery activities to the TV and radio commentators. If available, ship's personnel will be stationed at the TV and radio commentators' positions to assist and interpret recovery operations as required. This circuit will be required during the final recovery simulation and during the actual CM recovery operation.

Operation Order
COMHAWSEAFRON No. 339-71

3. Address and Filing Information. Press traffic will be addressed as outlined below:

FM: (Name of Ship)

TO: APOLLO NEWS CENTER, MCC HOUSTON, TEX
APOLLO NEWS CENTER, KENNEDY SPACE CENTER, FLA

BT

UNCLAS

PRS NO 001 (To be numbered consecutively)

Text

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

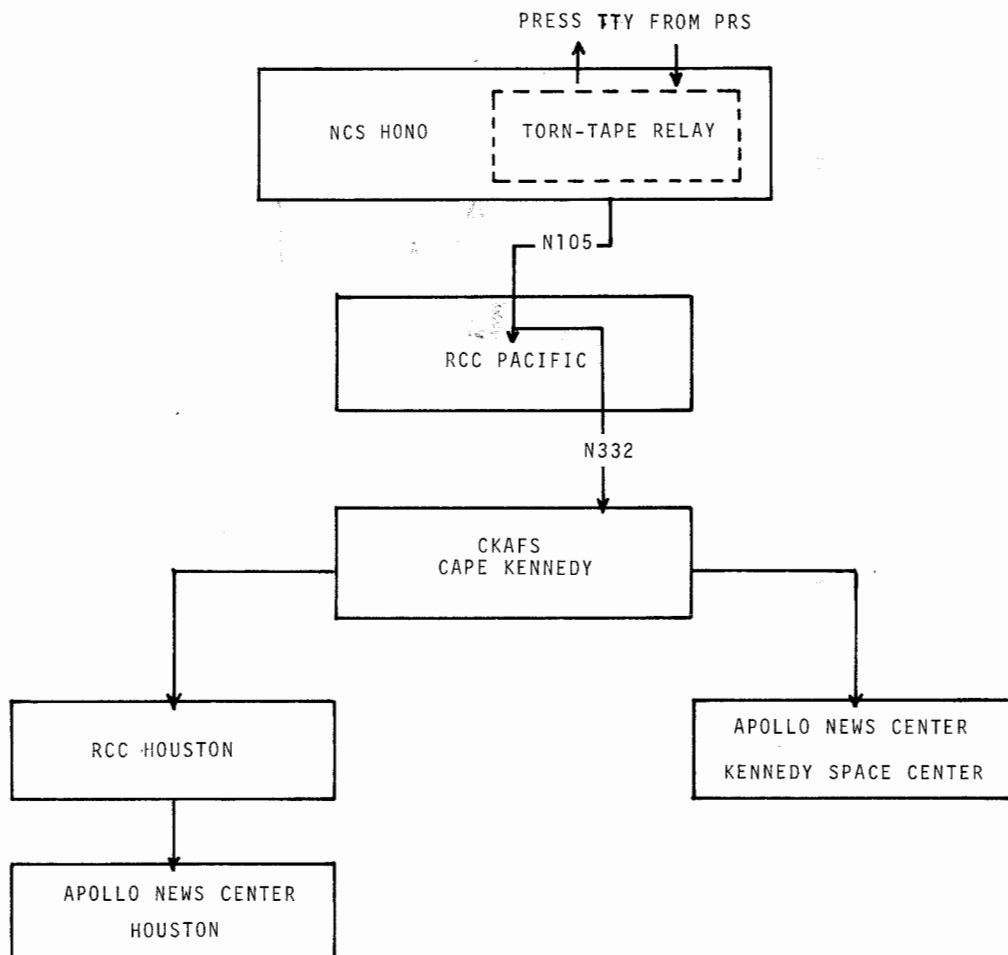
Authenticated:

R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Tab

A - Press Teletype Circuits

Tab A To Appendix VII to Annex E
Press Teletype Circuits



T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Operation Order
COMHAWSEAFRON No. 339-71

References: (a) COMHAWSEAFRON OPLAN 305-67
(b) DOD MGR for MSFS OPS and NASA MSC LRD Apollo Recovery Operational Procedures Manual, Revision B (16 Mar 70)

Annex G

Readiness and Training

1. General

a. Annex G to reference (a) sets forth overall guidance concerning training by units assigned to support Project Apollo. Task group commanders shall insure that the units involved are properly trained to carry out the assigned mission prior to reporting readiness to CTF 130 as directed in Annex R.

b. Navy units assigned for this mission will receive training after CHOP to CTF 130 at Pearl Harbor. The training will consist of the following as applicable:

- (1) Inport and underway recovery training
- (2) Weather observation and reporting training
- (3) Helicopter/UDT recovery training

(4) Emergency medical treatment and flotation collar training for UDT by NASA. (41ST ARRWG pararescue personnel will be trained separately). All training will be in accordance with references (a) and (b).

2. Equipment, Publications and Photographic Material

a. Recovery equipment required is listed in Chapter 3, reference (b). The equipment listed will be issued to the recovery ships.

b. Participating groups/units/elements shall have on hand the publications listed below to support this mission. Publications, as required, will be provided by CTF 130.

- (1) Reference (a)
- (2) COMHAWSEAFRON OPORD 339-71
- (3) PACAF OPLAN C136
- (4) Reference (b)
- (5) Apollo Overall Medical Plan (ships only)
- (6) CINCPACFLT Operation Order 220-YR, Annex B (ships only)
- (7) Applicable NASA MSC Biological Isolation documents (ships only))

c. Publications and equipment will be returned to the appropriate activity as soon as practicable. This includes:

- (1) Weather Kits (Annex M to reference (a))
- (2) Medical Kits (Annex H)
- (3) Recovery equipment
- (4) Publications issued (except for copies indicated in the distribution list)

d. Disposition of exposed film will be as follows:

- (1) NASA film - NASA film will be handled in accordance with Annex Q to reference (a).
- (2) DOD film - Film exposed in fulfillment of DOD requirements outlined in Annex Q to reference (a) will be forwarded to COMHAWSEAFRON (CTF 130), Attention PAO.

3. Schedules of Events. Predeployment training schedules of events for the assigned ships and embarked units are included in Appendix I to Annex A.

4. Underway Training. Predeployment underway training for assigned ships and embarked units will be in accordance with Appendix I to this Annex.

5. Shipriders. It is planned that representatives from CTF 130, NASA LRD (National Aeronautics and Space Administration, Landing and Recovery Division) and 41ST ARRWG (41ST Aerospace Rescue and Recovery Wing) will observe the exercises. Berthing requirements while embarked will be coordinated with the ship involved.

6. Conduct of the Training

a. The senior CTF 130 representative embarked in each ship will be in overall charge of training. Changes to existing procedures may be proposed as the training progresses.

b. All ships and assigned units will receive training in port prior to the at-sea training phase.

c. UDT swimmers will be used in conjunction with the PRS training. USAF pararescuemen will be used to assist in the training of the A0.

7. Scheduled Simulation Exercises. In addition to the unit training required by CTF 130, the DOD MGR will schedule simulation exercises designed to provide joint training for participating units. This training will be carried out in a manner that will provide the most realistic conditions and procedures attainable. The exercises that will involve TF 130 are:

a. F-2 Simex. This simulation will be conducted two days prior to launch and will simulate a landing occurring at 241730Z July 1971. The purpose of this simex will be to exercise recovery forces in effecting a recovery following an abort of the normal mission.

b. R-2 Simex. This simulation will be conducted two days prior to the end of the mission. The exact time will be promulgated as soon as the landing time is known. Its purpose will be to duplicate the actual recovery as closely as possible.

8. Safety. The safety of personnel is paramount during all phases of the training. When UDT swimmers are in the water they will be under visual observation by either the ship or helicopter personnel at all times. The safety of USAF pararescuemen requires one safety boat during operations. To insure maximum safety, CTF 130 personnel will be designated Training Safety Officers. They will observe all aspects of the training within their areas of responsibility and will have authority to stop the training at any time an unsafe condition exists or is imminent.

9. Communications. Communications during training periods will be in accordance with Appendix II to this Annex.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:


R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Appendices:

I - Predeployment Underway Training
II - Training Communications Plan

Appendix I to Annex G
Predeployment Underway Training

1. The following information is provided as a guideline to the Predeployment Underway Training of Naval units.

a. USS OKINAWA (LPH 3)

	<u>Date</u>	<u>Local Time (W)</u>	
N	19 July	0800	USS OKINAWA underway for Op Areas G-2, 4, 6, 14 and 16.
		1300-1530	Boilerplate pickup. Position all aircraft in array for practice. (Possible target point 20-41N 158-22W using azimuth 062°T). SWIM 2 deploy 3-man UDT team for collar installation. SWIM 1 deploy 3-man UDT team to act as astronauts. RECOVERY make astronaut pickup with PHOTO flying in close as required. Ship use primary method for CM pickup.
		1530	Upon completion conduct debrief Use balance of day to practice boilerplate approaches and pickups as required or desired.
	20 July	0830	Boilerplate pickup. Position all aircraft in array for practice. SWIM 1 deploy 3-man UDT team for collar installation. SWIM 2 deploy 3-man UDT team to act as astronauts. SWIM 2 make astronaut pickups. Use primary method for CM pickup.
		1100	Debrief.
		1300	Boilerplate pickup. Position all aircraft in array for practice. SWIM 2 deploy 3-man UDT team for collar installation. SWIM 1 deploy 3-man UDT team to act as astronauts. SWIM 1 make astronaut pickups. Use primary method for CM pickup.
		1500	Pacific Chief pass SIMEX information.
		1530	Upon completion of boilerplate pickup, conduct debrief. Use balance of day to practice boilerplate approaches and pickups using secondary recovery method.
	21 July	0700	Pacific Chief send time check.
		0800	USS OKINAWA place boilerplate in water at 20-41N 158-22W in time to arrive at 20-46N 158-24W no later than 0845.
		0805	COMEX when boilerplate is reported in water.
		0825	Launch aircraft in time to arrive on station at 0845.
		0900	Mains.
		0905	Splash.
		1100(about)	FINEX - return to Pearl Harbor.

Pacific Chief will start providing SIMEX build-up information about 201500W by sending a Target Point Update message, followed by an Entry Sequence Report and an Aircraft Position Update message. About 210700W all circuits should be up and checked out. By 210805W the boilerplate should be in the water at 20-41N 158-22W in time for COMEX. With COMEX the requirement for all reports in accordance with Annex R begins (Departure, weather, etc.). In the event of a communication failure with Pacific Chief, the SIMEX will continue as scheduled with CTF 130 representatives aboard providing the inputs. The PRS and aircraft are required on station 20 minutes prior to predicted splashdown. It is anticipated that the exercise will be completed about 211100W. Backup training, if required, will be scheduled on 22 July in the same area.

Operation Order
COMHAWSEAFRON No. 339-71

b. USS KAWISHIWI (AO 146)

<u>Date</u>	<u>Local Time (W)</u>
-------------	-----------------------

2 Aug	0800
-------	------

	1000
--	------

	1600
--	------

3-4 Aug	
---------	--

Underway for Op Area BP.

Boilerplate in the water. Deploy small boat with para-rescue personnel. Install flotation collar. KAWISHIWI commence approach and pickup of boilerplate. Balance of day is to be used for practice approaches and pickups as required or desired.

Return to Pearl.

Backup training, if required, will be scheduled in the same Op Area.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON
Captain, USN

Manned Spacecraft Recovery Officer

Appendix II to Annex G
Training Communications Plan

1. PRS Communications Circuits. Underway training periods for USS OKINAWA (LPH 3) afford the opportunity to conduct a "full-load" communications exercise between the OKINAWA and CTF 130. Accordingly, the PRS training communications plan is divided into two categories; predeployment underway training communications for OKINAWA, UDT 11 and HC-1; and communications test circuits for OKINAWA and CTF 130.

a. Predeployment Underway Training Circuits. UHF/VHF voice circuits are required between OKINAWA, HC-1 helicopters, UDT 11 swimmers and OKINAWA's motor whaleboat. Frequencies for these circuits will be provided by OKINAWA.

b. Communications Test Circuits for OKINAWA and CTF 130

(1) Two voice circuits are required, CTF 130 Command and Control and NASA/PRS Coordination. These circuits will be brought up in the same manner as for the end-of-mission communications. Routing will be by HF through NAVCOMMSTA HONO and ATS through ATS ground stations. HF frequencies will be in accordance with Annex E.

(2) Two teletype channels of the PRS shore termination will be exercised with one channel extended to CTF 130 for command and control and the other terminated at NAVCOMMSTA HONO for press.

(3) It is desired that personnel who are to man these circuits at various technical facility control points during the actual mission be available during this test in order that they may familiarize themselves with the operational aspects of the circuits.

c. Voice Call Signs

<u>Unit</u>	<u>Voice Call</u>
CTF 130 RCC	PACIFIC CHIEF
CTF 130 Communication Coordinator	PACIFIC RADIO
USS OKINAWA	OKINAWA
USS OKINAWA Communications Personnel	OKINAWA RADIO
NAVCOMMSTA HONO	HAWAII RADIO

d. CTF 130 and NASA personnel on board ship will use the respective ship's voice call and will identify themselves by name when communicating with CTF 130 RCC.

e. Additional Communications Requirements for 21 July SIMEX. The Command and Control circuit is to be up and radio checks completed by 210900W July. Astronaut Voice (296.8 MHz) will be set up prior to 0900W and circuit ROMEO will be checked out. Command and Control and Astronaut Voice will be set up with a position for CTF 130 and NASA representatives aboard ship to transmit and receive. CTF 130 at Kunia will be prepared to receive transmissions on circuit ROMEO.

2. AO Training Communications Circuits

a. Ship/Shore HF SSB voice between USS KAWISHIWI (AO 146) and CTF 130 (to be activated during underway periods only):

Primary 4705.5 kHz USB
Secondary 6691.5 kHz USB

b. Air/Ground UHF/VHF voice between KAWISHIWI and USAF aircraft:

Primary 264.2 MHz
Secondary 304.2 MHz

c. UHF voice between USAF aircraft, USAF pararescuemen and KAWISHIWI motor whaleboats.

296.8 MHz

d. Voice Call Signs

<u>Unit</u>	<u>Voice Call</u>
USS KAWISHIWI	KAWISHIWI
Whaleboats	BOAT ONE, TWO, ETC.
Pararescue Swimmers	FAIRWAY ONE, TWO, ETC.
CTF 130 RCC	PACIFIC CHIEF
CTF 130 Communication Coordinator	PACIFIC RADIO

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Annex H

Medical

1. General. The medical provisions contained in Annex H of reference (a) have been substantially revised by the DOD Overall Medical Plan, Department of Defense Medical Support for Project Apollo Operations (Second Edition) (Change 3 dtd 4 January 1971).

2. Special Medical Team and Recovery Support Facilities. The special medical team described in subparagraph 3b(1), Annex H, reference (a) will not be activated. Any DOD medical facility may be requested to render emergency treatment to the flight crew depending upon the area of recovery. The Mission Control Center Surgeon, Houston, Texas, will assist DOD in the selection of an appropriate facility for emergency treatment. In addition, each recovery support medical facility, as designated in the Overall Medical Plan, will maintain a general state of readiness, from launch to recovery, to provide care and treatment for the astronauts in the event of an unscheduled recovery in their respective area. It is anticipated that support facilities for the PACOM area will be:

U. S. Naval Hospital, San Diego, California
U. S. Army Tripler Army Medical Center, Hawaii
U. S. Naval Hospital, Guam, Mariana Islands
U. S. Naval Hospital, Subic Bay, Philippines
USAF Hospital Clark, Clark AB, Philippines
U. S. Army Hospital Okinawa, Ryukyu Islands
USAF Hospital Tachikawa, Tachikawa AB, Japan
U. S. Naval Hospital, Yokosuka, Japan
24TH USAF Dispensary, Howard AFB, Canal Zone

3. Port Liaison Officers/Petty Officers. The Apollo Medical Port Liaison Officers are designated to support the DOD MGR's Assistant for Bioastronautics by the Bureau of Medicine, Department of the Navy. In general, their responsibilities are to coordinate the movement of DOD MGR furnished medical equipment and supplies through their assigned port areas and to assist in the embarkation and debarkation of DOD MGR designated fleet recovery medical support personnel. For this mission, the designated port liaison representative for Pearl Harbor is CDR H. E. DANIELS, MSC, USN, at the U. S. Naval Station Dispensary, Pearl Harbor, Hawaii.

4. Ship-board Medical Personnel Requirements. The NASA medical team on the PRS will consist of two flight surgeons, five physicians, four scientists and five technicians. In addition to the NASA personnel, DOD medical personnel aboard the PRS will include two surgeons, two anesthesiologists, two surgical technicians, one X-ray technician and one laboratory technician.

5. Ship-board Medical Facilities Requirements. The post-flight medical examinations for the flight crew will be accomplished in the staff lounge and in the staterooms assigned to the flight crew; therefore, space in the sick bay area would be required only for an emergency situation and stowage of medical equipment. A 100 ma portable X-ray machine will be required after the flight crew has been brought aboard. The Medical Operations Division, NASA MSC, will coordinate the shipment of medical equipment from the Kennedy Space Center, Florida, and MSC to the Port Liaison Officer, Pearl Harbor, Hawaii. The equipment will be checked on board ship, prior to sailing, by the Assistant Recovery Surgeon.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson
R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Operation Order
COMHAWSEAFRON No. 339-71

Reference: (a) COMHAWSEAFRON OPLAN 305-67

Annex M

Meteorology

1. Requirements. Meteorological requirements will be in accordance with Annex M to reference (a) except as modified below:

a. Synoptic (surface) reports and upper air observations required from ships assigned to the recovery operation shall be addressed as follows:

To: RUHHAHA/FWC PEARL

RUHHFSA/NWS PAC REG

RUWTDRA/NASA MSC HOUSTON MCC

Info: RUHKBQH/RUHHHLHH/CTF ONE THREE ZERO

b. A synoptic (surface) report is required from the recovery ship nearest the landing point at the time of the CM landing. Also, a synoptic (surface) report is required from the retrieval ship at the time of CM retrieval.

c. Special surface observation reports, in the special A, B, C format, are required from the PRS hourly, from six hours prior to CM landing until CM retrieval.

d. RAWIN/RADIOSONDE observations are not required when the PRS is within 150 nm of Hawaii.

e. It is anticipated that aircraft weather reconnaissance responsibility for the mid-Pacific zone and EOM will be assigned to the 9TH Weather Wing by the DOD Manager. The 9TH Weather Wing will then coordinate with SMG (Spaceflight Meteorological Group), Honolulu, Hawaii and CTF 130 in determining type aircraft, staging base, briefing times and reporting procedures.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:



R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Reference: (b) DOD MGR for MSFS OPS and NASA MSC LRD Apollo Recovery Operational Procedures Manual, Revision B (16 Mar 70)

Annex R

Reports

1. General. In order that all pertinent information will be available on a timely basis to responsible personnel in both DOD and NASA it will be necessary to maintain a flow of information between the RCC (Recovery Control Center) and the recovery forces. Information regarding reports required by CTF 130 is included in the succeeding paragraphs and reference (b). This information is provided to assist in completing reports and should not be construed as limiting the scope and content or the submission of additional amplifying reports. During MINIMIZE, electrical transmission is authorized for all reports except those delineated in paragraph 8.
2. Readiness Condition. Task Group and Task Unit Commanders will keep CTF 130 advised of any situation that may affect their mission readiness. Such reports will include difficulties encountered, action being taken to alleviate the situation and an estimated time by which full readiness is expected.
3. Movement Reports.
 - a. U.S. Navy units file unclassified movement reports in accordance with the Supplement to NWIP 10-1C (info CTF 130). CTG 130.1 and CTG 130.5/CTU.1.4 will be authorized to check out of the movement report system for the period of deployment from Pearl Harbor for recovery operations.
 - b. USAF units file movement reports in accordance with PACAF OPLAN C136 and PACAF's Apollo 15 mission operations order.
4. Pre-Launch Readiness Report. CTF 130 will request readiness reports from Task Group Commanders at T-120 minutes. It is anticipated that Task Group Commanders will determine readiness of the units assigned prior to this time in order that reports may be made without delay.
5. Recovery Readiness Report. This report, required from all Task Group Commanders, prior to T-26 hours, will signify to CTF 130 that the Task Group is ready to conduct the assigned mission.
6. Weather Reports. Annex M defines weather reports required from units of TF 130.
7. Fuel Reports. Ships underway for direct mission support (not local OP Area training) shall make daily fuel reports by voice radio to CTF 130 not later than noon local time. Fuel shall be reported as a percentage of burnable NSFO (main propulsion fuel) on board as of the previous midnight. For purposes of this report 100 percent NSFO equals 95 percent of NSFO tank capacity.
8. Post Mission Reports.
 - a. Letter Report. Task Group Commanders shall submit consolidated post mission reports to CTF 130 not later than five working days after release of the units to normal opcon or return to homeport, whichever is later. These reports will contain an account of operations conducted and comments and recommendations on any aspect of preparation for and execution of recovery operations. Reports of surface forces should contain annotated surface plots in sufficient detail to allow reconstruction of ship movements. Aviation unit reports should contain a complete breakdown of individual aircraft flight hours by bureau number for each day involving mission identifiable participation. USAF units/elements shall submit reports to the Commander, 41ST ARRWG who will consolidate and submit to CTF 130.

Operation Order
COMHAWSEAFRON No. 339-71

b. Message Report. Individual PACFLT units providing support during the Apollo 15 mission shall submit Cost Factors Reports in accordance with CINCPACFLT Instruction 3163.1A. These reports should be submitted in sufficient time to reach CTF 130 within ten days following termination of the mission/return to homeport, whichever is later.

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:



R. T. TOLLESON
Captain, USN
Manned Spacecraft Recovery Officer

Annex X
Distribution

<u>Command</u>	<u>Copies</u>	<u>Command</u>	<u>Copies</u>
AEWRON 1	2	FEDERAL COMMUNICATIONS COMMISSION	1
AFETR (ETMO-1)	4	FIRST MOBILE COMMGRU	6
AFETR (ETOOP-2 ATTN: ETMOO)	5	FOCCPAC	2
APOLLO MISSION DIRECTOR, NASA KSC	1	FWC/JTWC GUAM	1
		FWC NORVA	1
CCGD FOURTEEN	5	FWC PEARL	2
CHIEF DCA PAC	3		
CHINFO	1	HELSPPRON 1	10
CINCPAC	3	HQ ARRS SCOTT AFB	2
CINCPAC (KUNIA)	1		
CINCPACAF	2	JCS	2
CINCPACFLT	8		
CNO	5	KWAJALEIN MISSILE RANGE	2
COMBATCAMGRUPAC	1		
COMBATCAMGRUPAC DET A	1	NAS AGANA, GUAM	1
COMFAIRSDIEGO	1	NAS BARBERS POINT	1
COMFAIRWESTPAC	1	NASA HQ WASH DC (CODE MORO)	2
COMFE COMMREG, FUCHU	1	NASA MSC LRD HOUSTON	41
COMFIRSTFLT	1	NAVAL WAR COLLEGE	1
COMHAWSEAFRON STAFF	30	NAVCOMMSTA GUAM	4
COMHAWSEAFRON STOCK	30	NAVCOMMSTA HONO	10
COMMAG	1	NCO EASTDIV PAC HF/DF NET	2
COMNAVAIRPAC	4	NCO WESTDIV PAC HF/DF NET	2
COMNAVCOMM	4		
COMNAVMARIANAS	2	PACAF BASECOM, HICKAM	2
COMNAVSHIPYD PEARL	1	PACCOMM AREA HICKAM	2
COMNAVSPCWARGRUPAC	1	PACMISANFAC HAW	3
COMPACMISRAH	3		
COMPHIBPAC	1	SAMTEC, HICKAM	2
COMPHIBRON 5	1	SAMTEC, WHEELER	1
COMPHIBOPSUPPAC	1	SUPT USN PG SCHOOL MONTEREY	1
COMSEA COMMREG, CLARK AFB	1		
COMSERVPAC	1	UDT 11	5
COMSERVRON 5	1	USA HOSPITAL OKINAWA, RYUKYU	1
COMWESTAREA CG	4	USA TRIPLER ARMY MEDICAL CENTER	1
CTF 140	3	USCINCSO	2
		U.S. NAVAL STATION	2
DCA	2	DISPENSARY, PEARL	
DCA OC	1	USS OKINAWA (LPH 3)	25
DCS STA FINEGAYAN	1	USS KAWISHIWI (AO 146)	15
DCS STA KWAJ	1		
DCS STA WAHIAWA	1	31ST ARRSQ	2
DDMS REP NASA HQ (CODE MOR)	1	36TH ARRSQ	2
DET ONE 41ST ARRWG, FUCHU AS	2	40TH ARRWG	2
DIRNAVSECGRU	1	41ST ARRWG	4
DOD MGR MSFS OPS	20	76TH ARRSQ	2
		79TH ARRSQ	2
FAA AREA MGR, GUAM	1	326TH AIR DIV	2
FAA AREA MGR, SAMOA	1	1957TH COMMGRU	1
FAA AREA MGR, WAKE	1	1958TH COMMSQ (AFCS) GUAM	1
FAA HONO ARTCC	1	6486TH USAF DISPENSARY, HICKAM	1
FAA PACIFIC REGION (PC-500)	1	6594TH TEST GROUP	1

T. B. HAYWARD
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:

R. T. Tolleson

R. T. TOLLESON

Captain, USN

Manned Spacecraft Recovery Officer