

**COMMANDER
MANNED SPACECRAFT
RECOVERY FORCE
PACIFIC**



**Commander Task Force 130
OPERATION ORDER 342-73**

PROJECT SKYLAB

(Short Title: CHSF OPORD 342-73)

HEADQUARTERS
HAWAIIAN SEA FRONTIER
Box 110
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34:REK
1459
18 April 1973

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

Subj: Commander Hawaiian Sea Frontier Operation Order 342-73; promulgation of

Ref: (a) COMHAWSEAFRON OPLAN 305-72

1. Reference (a) provides an overall plan which describes project Skylab recovery operations in the Pacific Command area. COMHAWSEAFRON Operation Order number 342-73 amplifies and modifies reference (a) for use in the Skylab series.

2. This operation order is effective for planning and training upon receipt, and for execution without signal on 14 May 1973.

3. This operation order may be carried and used in aircraft. Authority is also granted to make extracts from this operation order as necessary.

J. L. BUTTS
Rear Admiral, USN
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Distribution:
Annex X

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Operation Order
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Pacific Fleet
Commandant, Fourteenth Naval District and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)
Pearl Harbor, Hawaii
DTG: 182030Z April 1973
Message Ref: 1459/73

Reference: (a) COMHAWSEAFRON OPLAN 305-72
(b) DOD MGR for MSFS OPS and NASA JSC FCD Apollo Recovery Operations Procedures Manual, Revision E (24 October 1973)
(c) DOD MGR for MSFS OPS OPORDER 1-73

Time Zone: Use time zone ZULU for operations.

Task Organization for Skylab IV:

130	<u>Manned Spacecraft Recovery Force, Pacific</u>	CTF 130 RADM R. A. PADDOCK
a. 130.1	<u>Primary Landing Area Recovery Group</u>	CO, USS NEW ORLEANS (LPH 11) CAPT R. E. NEIGER (001156-90)
130.1.1	<u>Carrier Search and Recovery Unit</u>	CO, USS NEW ORLEANS (LPH 11) CAPT R. E. NEIGER (001156-90)
	NEW ORLEANS (LPH 11) 1 LPH HC-1 Skylab Det. 8 SH-3G UDT 12 Skylab Det. 14 swimmers	
b. 130.2	<u>Mid-Pacific Area Recovery Group</u>	As Assigned
130.2.1	<u>Secondary Recovery Ship</u>	Duty Salvage Ship ATF/ARS
	1 ARS/ATF	As Assigned
c. 130.4	<u>Land-based Air Search Group</u>	PACAF DOS (41ST ARRWG) COL C. N. MUIRHEAD, USAF
130.4.1	<u>Hawaii Land-based Air Search and Recovery Unit</u>	Commander, 76TH ARRSQ LTCOL L. B. HARRINGTON, USAF
	1 HC-130 aircraft 2 HH-53 refuelable helicopters	
130.4.4	<u>Philippines Land-based Air Search and Recovery Unit</u>	Commander, 31ST ARRSQ LTCOL W. OLSSON, USAF
	1 HC-130	
130.4.5	<u>Okinawa Land-based Air Search and Recovery Unit</u>	Commander, 33RD ARRSQ LTCOL N. L. CAGLE, USAF
	1 HC-130 aircraft	
130.4.6	<u>California Land-based Air Search and Recovery Unit</u>	Commander, 41ST ARRSQ LTCOL J. DAVIS, USAF
	1 HC-130 aircraft	

1. SITUATION. Project Skylab began with the placement of a 100 ton, unmanned workshop into a circular earth-orbit at an altitude of 233 nautical miles (Skylab I). Skylab II launched carrying the first three-man crew who rendezvoused with and transferred into the orbiting laboratory. During the 28 day mission, the astronauts investigated the physiological effects of extended duration space flight and conducted numerous astronomical and earth-resources surveys. On the basis of data gained on the first manned mission, Skylab III astronauts continued the experiments for a period of 59 days. The final crew expected to visit the orbiting workshop, launched aboard Skylab IV for a planned duration of 60 days (open-ended to 85 days), with a CM (command module) landing in the eastern Pacific near San Diego. This operation order provides for recovery operations in the PACOM (Pacific Command) area in support of the Skylab Program. Launch days (F-days) were as follows:

Skylab I	14 May 1973
Skylab II	25 May 1973
Skylab III	28 July 1973
Skylab IV	16 November 1973

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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 C 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) SRS (Secondary Recovery Ship). A ready duty ATF (fleet ocean tug) or ARS (salvage ship) will be on call at Pearl Harbor. In the event of an early mission termination in the SLA (secondary landing area), the SRS will CHOP (change operational control) to CTF 130 to effect CM (command module) retrieval. The SRS will be returned to normal OPCON (operational control) upon delivery of the CM to Pearl Harbor.

(2) Land-based Air Search Group

(a) 130.4.1 (Hawaii). From earth orbital insertion until docking (about 8 hours after launch), one dedicated ARRS Skylab configured HC-130 with 30 minute reaction time will be required. Although not a requirement, backup will be provided by one non-dedicated ARRS SAR alert (Skylab configured) HC-130. Additionally, two refuelable helicopters (HH-53) will be required, with backup provided by a third non-dedicated helicopter as available on 30 minute reaction time. After docking, one ARRS HC-130 will be required on normal SAR alert status. Two refuelable helicopters will be available to support the secondary landing area. For the first and second Skylab missions these assets will be released after entry for normal mission. For Skylab IV one HC-130 will be required to be airborne in the EOM area and the refuelable helicopters will be released after CM landing for normal mission.

(b) 130.4.4 (Philippines). One ARRS SAR alert (Skylab configured) HC-130 from orbital insertion until CM landing.

(c) 130.4.5 (Okinawa). One ARRS SAR alert (Skylab configured) HC-130 from orbital insertion until CM landing.

(d) 130.4.6 (California). One ARRS SAR alert (Skylab configured) HC-130 from orbital insertion until CM landing. Additionally, one HC-130 will be required to be on station to support planned landings in the PLA at the conclusions of Skylab II and Skylab III.

2. MISSION. Units of this force will train for, plan and execute search and recovery operations in order to effect the safe recovery of the Skylab 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 Skylab 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 Skylab primary landing area in accordance with references (a) and (b) and this operation order.

b. Mid-Pacific Area Recovery Group. In addition to performing the function of SRS, the assigned ATF/ARS will, if required, conduct, coordinate and control recovery operations in and adjacent to the secondary landing area in accordance with references (a) and (b) and this operation order during the period between launch time and the decision to target the landing in the primary landing area.

c. 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 Skylab configured aircraft to CTG 130.1 as required. "Skylab configured" denotes aircraft equipped with long-range fuel tanks, an ADDRS (Air Deployed Drift Reduction System) kit and three pararescuemen.

x. Coordinating Instructions

(1) This operation order is effective for planning and training upon receipt and for execution without signal at 151401Z NOV 73. It is cancelled 10 days after completion of the Skylab IV 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.

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(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 Skylab missions.

(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), **AS REVISED BY ANNEX H TO REFERENCE (C).**

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, **AS REVISED BY REFERENCE (C).**

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 THIRD Fleet.

c. Land-based air support forces will CHOP by message to CTF 130 on arrival at deployment bases, except that home-based elements will CHOP 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.

~~Authenticated:~~

R. E. KARGE
Commander, USN
Manned Spacecraft Recovery Officer

RICHARD A. PADDOCK
~~J. L. BUTTS~~

Rear Admiral, USN *COM 14 NAVDIST*
~~Commander Hawaiian Sea Frontier and~~
 Commander Manned Spacecraft Recovery Force,
 Pacific (CTF 130)

Annexes :

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

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 District Frontier~~ ^{COMMANDANT FOURTEENTH NAVAL}, 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. Concept and Description of Landing Areas. Landing areas are described in two general phases as follows:

a. Earth Orbital Phase. During the orbital phase of the mission, the recovery forces are required to be prepared to support a CM landing that would result from an early mission termination. Target points, which are the strategically located coordinates for which the CM would be targeted if it became necessary to land, will be selected for each CSM (command and service module) revolution. The following format will be used to designate target points:

- Sector 1 - includes the 80° W meridian and all the area east to 50° W from 0° to 50° N latitude.
- Sector 2 - includes the 50° W meridian and all the area east to 20° E from 0° to 50° N latitude.
- Sector 3 - includes the 20° E meridian and all the area east to 170° E from 0° to 50° N latitude.
- Sector 4 - includes the 170° E meridian and all the area east to 140° W from 0° to 50° N latitude.
- Sector 5 - includes the 140° W meridian and all the area east to 80° W from 0° to 50° N latitude.
- Sector 6 - includes all the area of the world south of 0° to 50° S latitude.

Three types of target points are defined as follows:

"G" - "GO/NO-GO" target point. This target point reflects a two-burn de-orbit sequence, GNCS (Guidance and Navigation Control System) entry and is geographically located to allow rapid transfer of the flight crew from the CM to the SML (Skylab Mobile Laboratory).

"B" - "BLOCK DATA" target point. This target point reflects a single impulse de-orbit burn sequence and EMS (Entry Monitoring System) entry which will be transmitted to the spacecraft and stored there for use in a communications loss situation.

"C" - "CONTINGENCY" target point. This provides at least one target point for each workshop revolution.

For example, 2417-5B indicates a target point for revolution 2417, located in the east-Pacific sector (see Appendix III), and is a block data-type target point.

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(1) SLA (Secondary Landing Area). The SLA is the area in which the probability of a CM landing is sufficiently high to require pre-positioned forces to retrieve the flight crew. This area is located in the vicinity of the Hawaiian Islands (see Appendix II). Recovery force support required for this area includes HH-53C air-refuelable helicopters, search and rescue aircraft, a secondary recovery ship, and C-5A aircraft with the SML (Skylab Mobile Laboratory) on board. The SLA support operations, if required, will be conducted in the following manner: During each Skylab mission, the SML will be maintained in a ready state at the Johnson Space Center, Houston, Texas. After a decision is made to terminate the mission, a C-5A aircraft would be requested to fly to and load the SML at Ellington AFB, Texas. The SML would then be flown to one of the following airfields: Barking Sands, Kauai; Hickam AFB, Oahu; or General Lyman, Hilo, Hawaii. Additionally, SML and recovery force support exists at Johnston Island in the event of a contingency landing in that vicinity.

Airfield selection will be dependent upon the target point location, determined by considering such factors as groundtrack location, direction of CM entry, land mass clearance and weather. Recovery operations will be conducted by refuelable helicopters and HC-130 aircraft from Hickam AFB and a secondary recovery ship from Pearl Harbor. The flight crew would be retrieved by helicopter and delivered to the SML. After a maximum of three days at the island base, the C-5A would fly the flight crew and the SML back to Ellington AFB, Texas. The SRS would retrieve the CM and deliver it to Pearl Harbor for transfer to Hickam AFB for deactivation.

(2) Contingency Landing Area. The contingency landing area is defined as the area around the Earth in a band between 50° North and 50° South latitudes that lies outside the primary and secondary landing areas.

The probability of landing in this area is so low that only home-based search and rescue aircraft support is warranted. Recovery force support for this area will be provided by the aircraft supporting the secondary landing area and one ARRS SAR alert aircraft, Skylab configured, at Clark AB, Philippines; Kadena AB, Okinawa; Woodbridge RAF, England; Hamilton AFB, California; Pease AFB, New Hampshire; and Eglin AFB, Florida. Air-refuelable helicopters at ARRS bases may be required to retrieve the flight crew if a CM landing occurs within their operational capability. Ships-of-opportunity will provide the flight crew and/or CM retrieval capability. Because of the extreme environmental conditions that can be experienced in the higher latitudes, ARRS pararescuemen must have the ability to perform under conditions approximating 33°F water temperature and 25°F air temperature for a period of three hours and then be able to survive in a covered, heated raft for a period of at least eight hours.

b. Normal End-of-Mission Phase. The normal end-of-mission phase begins with entry into the atmosphere at about 400,000 feet altitude and terminates with the successful recovery of the astronauts and command module in the PLA (Primary Landing Area).

(1) The PLA is that area where the probability of landing is highest and warrants the requirements for PRS (Primary Recovery Ship) support. This phase of the mission begins when the PRS, with the SML on board, is required to be on-station (approximately six days) prior to the planned end-of-mission). The PLA for the Skylabs II and III missions will be in the East Pacific, off the lower U. S. west coast, and in the mid-Pacific in the vicinity of the Hawaiian Islands for Skylab IV. Recovery force support for this area consists of a PRS and a search and rescue aircraft pre-positioned as described in Annex C.

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 Appendix III to Annex C and 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 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

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

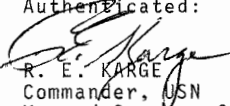
5. Launch Time, Holds and Scrubs. The exact launch times and dates for Skylab missions will be provided to recovery forces by message. Any malfunctions detected before launch in spacecraft or launch vehicle systems, ground support equipment or instrumentation, which could result in failure to achieve the primary objective of the mission, will be cause to hold or cancel any mission until the cause of the malfunction has been eliminated. In the event of a launch delay, the mission will be rescheduled and all forces will be notified by message.

6. 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).

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

RICHARD A. PADDOCK
~~U.S. NAVY~~
Rear Admiral, USN **COM 14NAVDIST**
~~Commander Hawaiian Sea Frontier and~~
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:


R. E. KARGE
Commander, USN
Manned Spacecraft Recovery Officer

Appendices:

- I - Recovery Force Schedule of Events
- II - Skylab Secondary Landing Area (Fence Bases)
- III - Target Point Sectors

Appendix I to Annex A

SkyLab IV Recovery Force Schedule of Events

(Based on 16 November 1973 Launch)

Event Number	Date/Time	Participants	Events/Remarks	Location
	<u>JANUARY</u>			
1	041700Z	CTG 130.1 (NEW ORLEANS)	Underway for Pearl Harbor.	San Diego
2	041700Z	CTG 130.1	CHOP to CTF 130 with CTF 130 Staff, HC-1, UDT 12 SkyLab DET embarked.	San Diego
3	042100Z	TG 130.1	Pre-mission Training Conference by CTF 130 Staff and NASA team.	NEW ORLEANS wardroom
4	051700Z	TG 130.1	SIMEX (TYPE II) (See Note 1)	En route
5	071800Z	TG 130.1	SIMEX (TYPE I)	En route
6	081800Z	TG 130.1	SIMEX (TYPE III/NS-50)	En route
7	091900Z	TG 130.1	SIMEX (TYPE II)	En route
8	111900Z (110900W)	TG 130.1	Arrive Pearl Harbor, commence final loadout and SML onload immediately on arrival.	Pearl Harbor, Support 13 Jan T.P. Inport
9	131800Z (130800W)	TG 130.1	Underway for support of early termination T.P.'s	Pearl Harbor
10	131800Z (130800W)	TG 130.1	Commence support early termination target points as directed by CTF 130 beginning with 141825Z JAN T.P.	En route Primary Landing Area (See note 1)
11	192358Z	TG 130.1	Support possible landing at T.P. "A" until released.	21-42N, 128-25W
12	202316Z	TG 130.1	Support possible landing at T.P. "B" until released.	24-10N, 126-00W
13	212234Z	TG 130.1	Support possible landing at T.P. "C" until released.	26-25N, 123-35W
14	222152Z	TG 130.1	Support possible landing at T.P. "D" until released.	29-00N, 121-13W
15	232110Z	TG 130.1	Support possible landing at T.P. "E" until released.	29-45N, 120-25W
16	242158Z	TG 130.1	Support possible landing at T.P. "A" until released.	21-42N, 128-25W
17	252116Z	TG 130.1	Support possible landing at T.P. "B" until released.	24-10N, 126-00W

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Event Number	Date/Time	Participants	Events/Remarks	Location
18	262034Z	TG 130.1	Support possible landing at T.P. "C" until released.	26-25N, 123-35W (see note 3)
19	270200Z	TG 130.1	Arrive San Diego (NORIS), load TV and press pool personnel and equipment immediately on arrival.	Support 281952Z JAN T.P. ("D") and 291910Z JAN T.P. ("E") inport San Diego.
20	291600Z	TG 130.1	Underway for support of EOM Target Points.	San Diego (See note 4)
21	301916Z	TG 130.1	Support possible landing at T.P. "B" until released.	24-10N, 126-00W
22	311834Z	TG 130.1	Support possible landing at T.P. "C" until released.	26-25N, 123-35W
23	FEBRUARY 011752Z	TG 130.1	Support possible landing at T.P. "D" until released.	29-00N, 121-13W
24	021710Z	TG 130.1	Support possible landing at T.P. "E" until released.	29-45N, 120-25W
25	02XXXXZ	TG 130.1	PRS receive COD Fly-On for delivery medical team members. (If directed by CTF 130)	To be conducted following SIMEX
26	031758Z	TG 130.1	Support possible landing at T.P. "A" until released.	21-42N, 128-25W
27	041716Z	TG 130.1	Support possible landing at T.P. "B" until released.	24-10N, 126-00W
28	051634Z	TG 130.1	Support possible landing at T.P. "C" until released.	26-25N, 123-35W
29	061510Z	TG 130.1	R-2 SIMEX and isotope retrieval from C-130 a/c if req.	TBA
30	061552Z	TG 130.1	Support possible landing at T.P. "D" until released.	29-00N, 121-13W
31	07XXXXZ	TG 130.1	PRS receive COD Fly-On for delivery of VIP's and isotopes if directed by CTF 130.	TBA
32	081440Z	SKYLAB IV TF 130	On station to support SKYLAB IV landing at 081510Z. Effect recovery.	29-45N, 120-25W
33	081800Z	TG 130.1	After Astronaut/CM Retrieval depart for San Diego at speed consonant with medical requirements.	Vicinity 29-45N, 120-25W
34	09XXXXZ	TG 130.1	PRS conduct COD Launch for delivery of PAO film to NAS Miramar.	En route San Diego

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Event Number	Date/Time	Participants	Events/Remarks	Location
35	091700Z 1600	TG 130.1	Arrive San Diego berth.	NAS North Island
36	101700Z 2000	TG 130.1	Mission termination ceremonies on board PRS. Crew depart about noon. Off-load SML in afternoon. 082100Z	San Diego (NORIS). OUT-CHOP when SML off-load complete.

- Note:
1. SIMEX Types I - III are described in Appendix I to Annex G. SIMEXs will be conducted as directed by CTF 130 during period after departing Pearl Harbor to support Primary Landing Area.
 2. A minimum of 24 hours leadtime can be assumed to determine PRS position. While supporting target points off the west coast, the PRS position should be biased toward San Diego.
 3. A minimum of 29 Hours leadtime can be assumed to determine PRS position for supporting 272034Z JAN Target Point "C".
 4. A minimum of 64 hours leadtime can be assumed to determine PRS position for supporting 301958Z JAN Target Point "A".

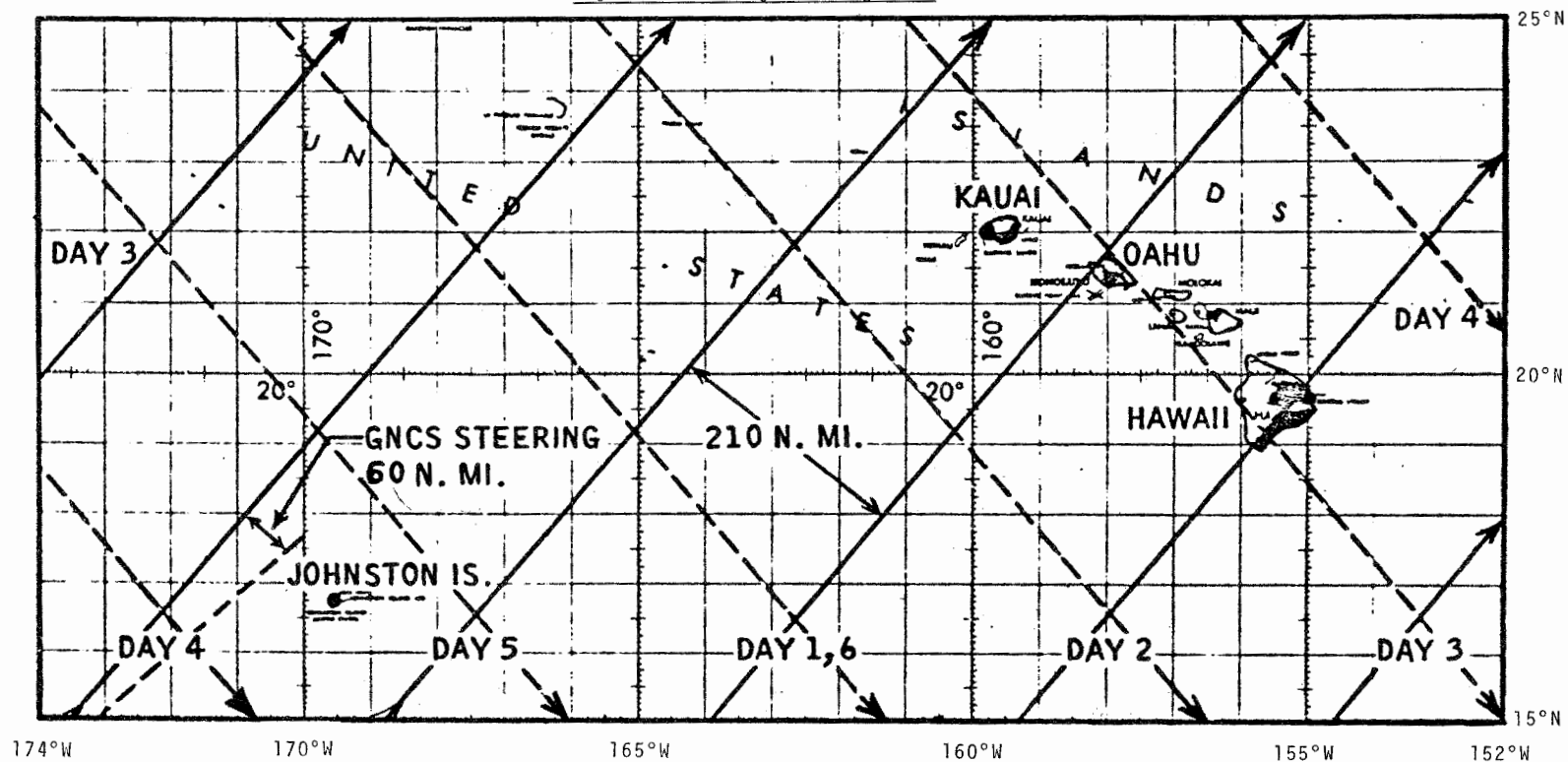
RICHARD A. PADDOCK
Rear Admiral, USN
Commandant, Fourteenth Naval District and
Commander Manned Spacecraft Recovery Force,
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Authenticated:


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Appendix II to Annex A
 Skylab Secondary Landing Area



A-II-1

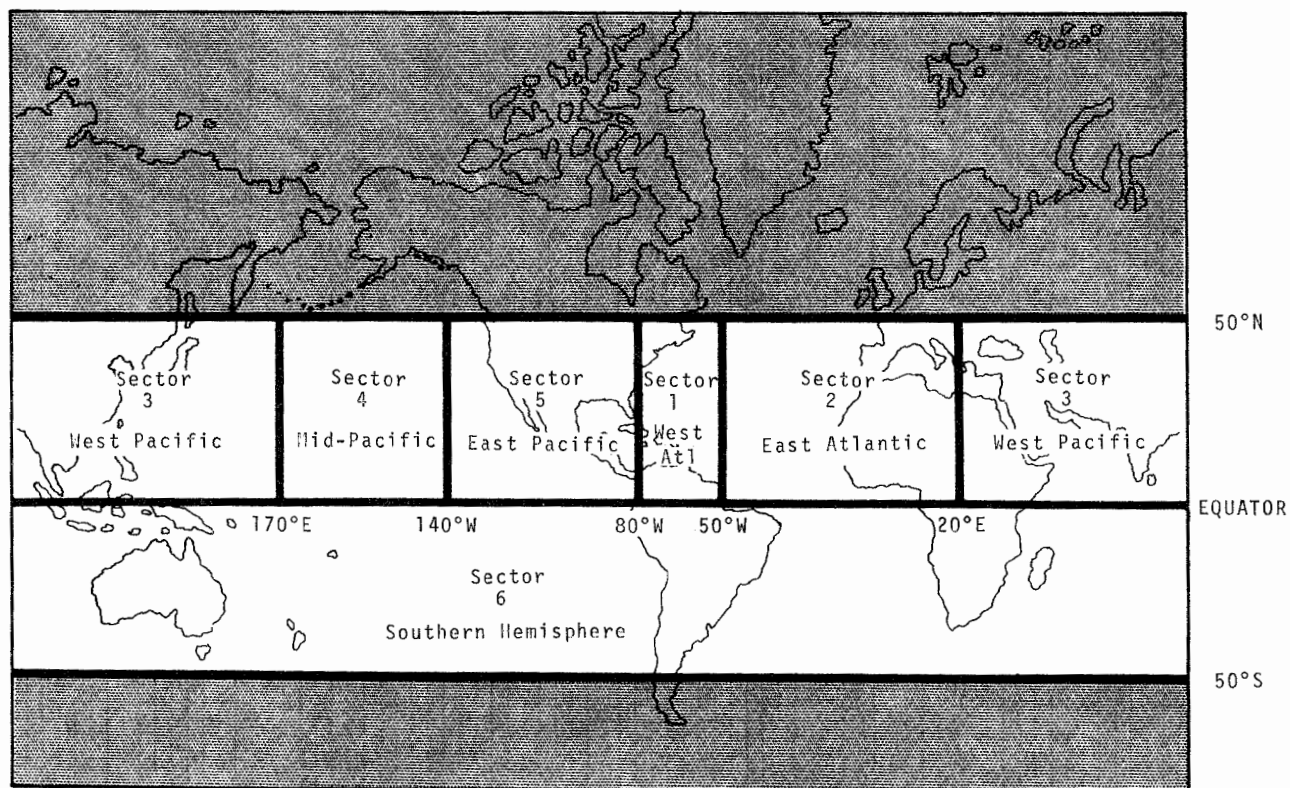
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Appendix III to Annex A
Target Point Sectors



A-III-1

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- Reference: (a) COMHAWSEAFRON OPLAN 305-72
(b) DOD MGR for MSFS OPS and NASA MSC FC7 Apollo Recovery Operational Procedures Manual, Revision E (10 October 1972)

Annex B

Skylab Mission

1. General. The general description and objectives of the overall Skylab program, spacecraft characteristics, location aids and recovery equipment used in Skylab are set forth in references (a) and (b). This Annex presents a detailed description of the Skylab missions.
2. Skylab Mission Plan. The Skylab vehicles are scheduled to be launched as follows:

MISSION	TYPE	PLANNED LAUNCH DATE	APPROX. DAYS DURATION	PLANNED EOM DATE	PLANNED EOM LANDING AREA
SKYLAB 1/2 (SL-1) (SL-2)	Earth Orbital	14 May 73 15 May 73	28	12 June 73	Off U. S. West Coast
SKYLAB 3 (SL-3)	Earth Orbital	~~28 JUL 73~~ ~~8 Aug 73~~	56	~~22 SEP 73~~ ~~3 Oct 73~~	Off U. S. West Coast
SKYLAB 4 (SL-4)	Earth Orbital	~~16~~ 9 Nov 73	~~60~~ OPEN ENDED to 95	~~8 FEB 74~~ 9 Jan 74	~~OFF U.S. WEST~~ ~~Near Hawaii~~ COAST

The manned Skylab missions will be launched on a launch azimuth between 52 degrees and 37 degrees with a nominal azimuth of 47 degrees. This will result in an orbit with a ground track extending from 50 degrees North latitude to 50 degrees South latitude. Because of these parameters and the long duration of the missions, certain new and unique recovery considerations must be evaluated. Recovery forces must have the capability of working effectively in the open ocean at latitudes between 50 degrees North and 50 degrees South, and post-retrieval logistics must provide for the rapid movement of astronauts to designated debrief/medical facilities for the collection and preservation of certain biological and environmental data.

The following describes each Skylab mission:

a. SL-1 and SL-2 Missions

The first Skylab mission will consist of two launches (SL-1 and SL-2) approximately one day apart. A two-stage Saturn V launch vehicle will be used for the first launch to insert an unmanned SWS (Saturn workshop) into a 233 nautical mile circular, 50 degree inclination orbit. The SWS consists of a modified S-IVB OWS (orbital workshop), an AM (airlock module), an MDA (multiple docking adaptor), an ATM (Apollo telescope mount) and an IU (instrument unit).

The second launch (SL-2) consisting of a manned CSM (command and service module) on a Saturn I-B launch vehicle will occur one day after the SL-1 launch. This second launch will place the CSM in an orbit which will allow the CSM to rendezvous and dock with the SWS forming an OA (orbital assembly) as shown in Appendix I to Annex B.

The primary objectives of this mission are to establish the SWS in earth orbit and operate the OA as a habitable space structure for up to 28 days after the SL-2 launch; to obtain biomedical data on the crew for use in extending, for future missions, the duration of manned space flight; to obtain solar astronomy and earth resources data; and to perform scientific, engineering, and technological experiments.

After completion of the scheduled activities, the workshop will be placed in an orbital storage attitude with respect to the sun. The CSM will then undock and de-orbit by means of the service propulsion systems. Following SM jettison, the CM (command module) will be oriented heat shield forward for entry. The entry phase will begin over the eastern Pacific Ocean at about 400,000 feet altitude. Normal range from this point to splashdown is 1,654 nautical miles.

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b. SL-3 Mission

IS PRESENTLY SCHEDULED TO LAUNCH AT 1100Z ON 28 JULY 73.
SL-3 ~~will be launched approximately 85 days after the SL-2 launch and is presently~~
~~planned to be a night launch.~~ This launch will also be performed with a Saturn I-B and will
place a second manned CSM in orbit to rendezvous and dock with the SWS. This mission is
planned for a period of up to 56 days and will continue the medical, technical, and scientific
experiments started on the first Skylab missions.

c. SL-4 Mission

~~IS EXPECTED TO~~ ~~WILL~~ ~~be the last mission to visit the SWS.~~ The launch ~~will occur~~ ~~approximately~~
~~85 days after the SL-3 launch.~~ This mission is also planned for a duration of up to 85 days ~~and will~~ ~~pursue~~ ~~experiments similar to those conducted on the two previous missions.~~ ~~85 DAY~~ ~~TO~~ ~~OPEN-ENDED TO~~
OCCURRED AT 161401Z NOV '73

3. Skylab Program Objectives. The Skylab program objectives are to extend the duration of
manned space flight and to perform experiments which can be accomplished from an orbiting
platform. Generally, these involve biomedical experiments to determine the effect of ex-
tended exposure of man to spaceflight, astronomical photography in the short wave length
region of the spectrum which is severely hindered by the earth's atmosphere, and multispectral
photography of the earth's surface in order to accumulate earth resource information.

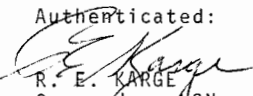
4. Skylab Spacecraft Configuration. Appendix III, Annex C to reference (a), contains
descriptions of the spacecraft and spacecraft systems.

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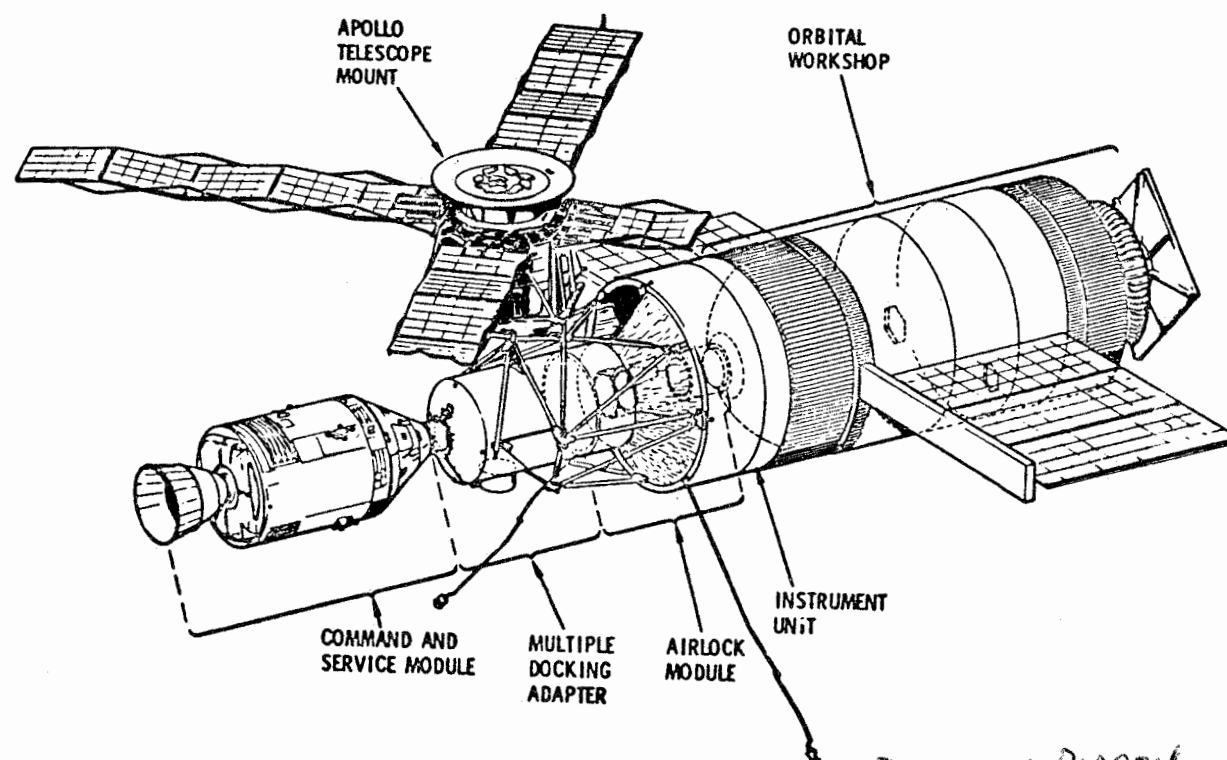

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Appendices:

I - Skylab Orbital Assembly

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Appendix I to Annex B
Skylab Orbital Assembly



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Operation Order
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- Reference (a) COMHAWSEAFRON OPLAN 305-72
(b) DOD MGR for MSFS OPS and NASA MSC FCD Apollo Recovery Operational Procedures Manual, Revision E, (10 Oct 72)

Annex C

Planned Recovery Operations

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

2. Landing Area Support. Annex A contains the description of landing areas associated with the two 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 orbital phase prior to and after docking with the Skylab as follows:

(1) Search and Rescue Aircraft Requirements. Search and rescue aircraft based at Hickam AFB, Hawaii will support the SLA. From launch through rendezvous, one aircraft with a 30-minute reaction time is required to support the target points located in the vicinity of Hawaii. After rendezvous, one aircraft on ARRS SAR alert, Skylab configured, can support this area.

Prior to CM reentry, the dedicated HC-130 aircraft and, if available, a second HC-130 will be on station as depicted in Appendix II. Both aircraft shall depart station and fly inbound to the groundtrack two minutes prior to the predicted end of S-band blackout. If S-band blackout time is not available, the aircraft should depart station 12 minutes before predicted CM landing time.

(2) HH-53C Helicopter Requirements. It is required that two HH-53C helicopters be prepared to provide retrieval and delivery of the flight crew to the SML (Skylab Mobile Laboratory) within approximately one hour after CM landing. These helicopters should be on alert so that they can be on-station prior to CM landing. In event of a landing, one helicopter should be positioned 4 nm uprange of the target point and the other 4 nm downrange of the target point. If a search and rescue tanker is used, it will be positioned downrange of the target point but not within 7 nm of the target point.

(3) SRS (Secondary Recovery Ship). An SRS will be required to retrieve the CM and deliver it to Pearl Harbor. This ship is planned to be the duty salvage ship at Pearl Harbor. When a decision is made to terminate the mission (at least 24 hours lead time is anticipated), the ship shall proceed toward the target point and will be positioned 7 nm from the target point, if it can arrive on-station before CM landing.

b. End-of-Mission Phase. Recovery support for this phase of the mission consists of supporting the end-of-mission primary landing area. Aircraft and ship support will be in accordance with Appendices I and II.

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 D 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 re-entry.

(2) An area 200 nm along and 25 nm either side of the planned groundtrack. 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 groundtrack 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 establish communications with the astronauts on 296.8 MHz will 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 reference (b).

a. Astronaut Recovery. Project Skylab flights will be non-quarantine missions. Special equipment and procedures for decontamination and quarantine will not be required, however, retrieval time is critical. A requirement exists for the astronauts to be retrieved and delivered into the SML (Skylab Mobile Laboratory) within approximately one hour after landing. The SML is a transportable medical facility which will be employed by NASA during Skylab to serve as a medical center for post-flight examinations. It consists of six units which are approximately 7 feet by 7 feet by 10 feet each. The facility will utilize approximately 3,500 square feet of deck space and weighs about 103,000 pounds.

THE PREFERRED METHOD OF FLIGHT CREW RETRIEVAL IN THE PRIMARY LANDING AREA IS BY PRS B AND A CRANE/NASA INCH WITH THE FLIGHT CREW IN THE CM. THE ALTERNATE ASTRONAUT RECOVERY METHOD IS TO RETRIEVE THE ASTRONAUTS BY A HOVERING HELICOPTER AS ADDRESSED IN REFERENCE B. IF NECESSARY, HOISTING MAY BE PERFORMED WITH EACH ASTRONAUT IN A SUPINE POSITION. THE RECOVERY METHOD UTILIZED WILL BE DETERMINED BY THE TASK FORCE COMMANDER R, IN HIS ABSENCE, THE TASK GROUP COMMANDER, AFTER CONSULTATION WITH THE NASA RECOVERY TEAM LEADER.

c. Supine Recovery. Extended exposure to weightlessness may result in physiological consequences requiring minimum exertion by the flight crew upon their return to a normal gravity environment. Procedures and equipment have been developed for effecting supine recovery of the Project Skylab astronauts. The supine recovery technique necessitates an additional (fourth) swimmer at the CM and a third helicopter crewman to assist in handling the litter in which each astronaut will be retrieved. Recovery forces will be thoroughly trained, equipped and prepared to conduct supine recovery.

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. 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 Skylab, 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

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imperative that an extremely accurate position of the CM landing point be reported to NASA-JSC. 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 re-transmission of telemetry information from the Skylab 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.

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Appendices:

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

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 Skylab ~~IV~~ are as follows:

a. Ships. Anticipated ship station assignments and anticipated PRS positioning constraints for planned times of orbital aborts are contained in Tab A and Tab B, respectively. Ships will operate in compliance with these tabs 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 C.

3. The times indicated in this appendix are approximate and are based on a first opportunity launch.

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Tabs:

- A - Mission Support Ship Station Assignments
- B - PRS Positioning Data
- C - Mission Support Aircraft Assignments

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Tab A to Appendix I to Annex C
Mission Support Ship Station Assignments

Event Number	Date/Time	Position	Mission	Remarks
	<u>JANUARY</u>			
1	041700Z	San Diego	Underway for Pearl Harbor.	CHOP to CTF 130 OPCON
8	111900Z (110900W)	Pearl Harbor	Arrive Pearl Harbor, commence final loadout and SML onload.	
9	131800Z (130800W)	Pearl Harbor	Underway for support of early termination target points.	Support target points as assigned en route/in eastern Pacific area.
19	270200Z	San Diego	Arrive San Diego. Load TV and Press Pool personnel and equipment immediately on arrival NORIS.	Support 281952Z JAN T.P. ("D") and 291910Z JAN T.P. ("E") inport San Diego.
20	291600Z	San Diego	Underway for support of EOM target points.	Support target points as assigned.
25	02XXXXZ	Primary Landing Area	PRS receive COD fly-on for delivery of medical team personnel if directed by CTF 130.	To be conducted after SIMEX, time TBA.
26	031758Z	21-42N, 128-25W	Support T.P. "A"	In position to support landing.
27	041716Z	24-10N, 126-00W	Support T.P. "B"	In position to support landing.
28	051634Z	26-25N, 123-35W	Support T.P. "C"	In position to support landing.
29	061510Z	TBA	R-2 EOM SIMEX. If required, retrieve isotope drop from C-130.	TF 130
30	061552Z	29-00N, 121-13W	Support T.P. "D"	In position to support landing.
31	07XXXXZ	TBA	PRS receive COD fly-on for delivery of VIP's and isotopes if directed by CTF 130.	Time TBA

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Event Number	Date/Time	Position	Mission	Remarks
32	081440Z	29-45N, 120-25W	SKYLAB IV Landing/Recovery	R-Day EOM Array for 081510Z landing.
33	081800Z	Vicinity of 29-45N, 120-25W	PRS depart for San Diego at speed consonant with Astronaut medical examinations.	
34	08XXXXZ	TBA	PRS conduct COD launch for delivery of PAO film to NAS MIRAMAR.	Time TBA
35	¹⁶⁰⁰ 091700Z	San Diego	PRS arrive San Diego (NORIS). Commence off-load.	
36	²⁰⁰⁰ 101700Z	San Diego	Conduct mission termination ceremonies on board PRS. Crew depart about noon. Off-load SML in afternoon. ⁰⁸	PRS OUTCHOP when released.

C-1-A-2 (CH-4)

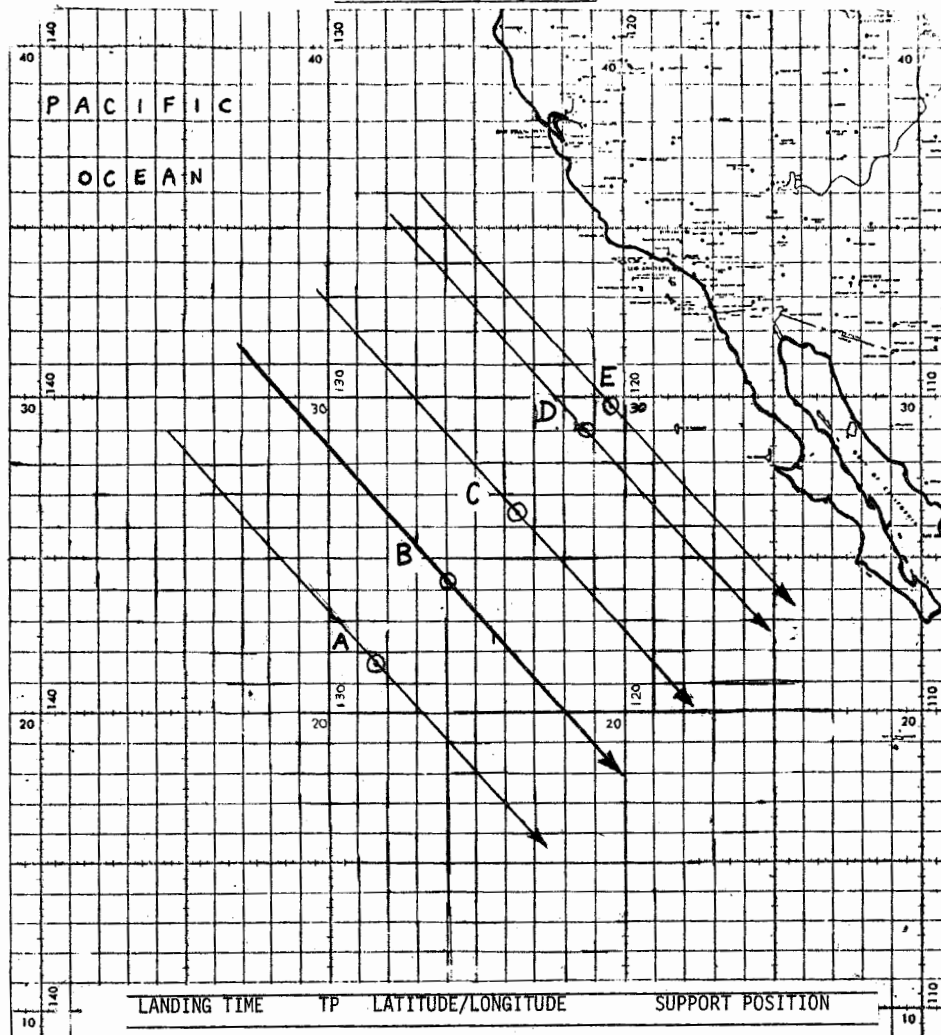
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Tab B to Appendix I to Annex C

PRS Positioning Data



LANDING TIME	TP	LATITUDE/LONGITUDE	SUPPORT POSITION
041758Z	A	21-42N/128-25W	Vic TP A
051716Z	B	24-10N/126-00W	Vic TP B
061634Z	C	26-25N/123-35W	Vic TP C
071552Z	D	29-00N/121-13W	Vic TP D
081510Z	E	29-45N/120-25W	Vic TP E

Note: A minimum of 24 hours leadtime can be assumed to determine PRS positioning. While supporting target points off the West Coast, the PRS position should be biased toward San Diego.

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

1. Orbit Insertion to Docking and SLA (Secondary Landing Area) Search and Rescue Aircraft Support

Staging Base	Orbit Insertion to Docking	(SLA) Secondary Landing Area	Remarks
Hickam AFB, Hawaii	Two refuelable helicopters and one HC-130 on 30-minute reaction time.	One HC-130 (1) on ARRS alert; two helicopters prepared to support SLA.	SL-2 Aircraft released & after entry for SL-3 normal mission. SL-4 One HC-130 airborne in the EOM area. Refuelable helicop- ters released after CM landing for normal mission.
Hamilton AFB, ~~MCCLELLAN AFB~~ California	One HC-130 on ARRS SAR alert. Skylab configured. *	One HC-130 on ARRS SAR alert, Skylab configured. *	One HC-130 air- borne in EOM area for SL-2 & SL-3.
Kadena AB, Okinawa	One HC-130 on ARRS SAR alert, Skylab configured. *	One HC-130 on ARRS SAR alert, Skylab configured. *	Aircraft released after entry for normal mission.
Clark AB, Philippines	One HC-130 on ARRS SAR alert, Skylab configured. *	One HC-130 on ARRS SAR alert, Skylab configured. *	Aircraft released after entry for normal mission.
	* - Refuelable helicopters may be required to retrieve the flight crew if a CM landing occurs within their operational capability.		

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

Name/Voice Call	Task	Altitude	Station Assignment	Holding Instructions
RECOVERY (SH-3)	Primary astronaut recovery	5,000 ft	~~4~~ 6 nm from TP as depicted in Appendix II	Establish 2 minute holding pattern on station oriented toward predicted splash point at main parachute deployment.
ELS (SH-3)	Recovery of ELS components	5,000 ft	~~8~~ 8 nm from TP as depicted in Appendix II	Same as RECOVERY
SWIM (SH-3)	Secondary astronaut recovery	5,000 ft	10 nm from TP as depicted in Appendix II	Same as RECOVERY
PHOTO (SH-3)	Photography & television helicopter photographers embarked as directed by NASA Recovery Team Leader	1,000 ft or below	~~8~~ 8 nm from TP as depicted in Appendix II	
RELAY ~~(E-10)~~ (SH-3)	UHF/UHF and UHF/HF SSB relay of 296.8 MHz	~~8,000 ft~~ AS	ASSIGNED BY THE PRS AIR CONTROLLER ~~45 nm from TP as depicted in Appendix II~~	Remain within 5 nm of station
Assigned when launched (SH-3)	Backup SWIM/RECOVERY/PHOTO helicopter		Condition II standby on PRS.	
Assigned when launched ~~(E-10)~~ (SH-3)	Backup relay		Condition II standby on PRS.	

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3. 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.	Time and number of flights will depend upon weather conditions (maximum of one flight per day).
A/C of Opportunity	In event of SLA landing and as directed by CTF 130	Conduct long-range weather reconnaissance in EOM and adjacent areas.	

4. Logistic Support Aircraft

Manned Mission	Event	Aircraft Type	Time Required	From	To	Purpose	Remarks
SL-2 & SL-3 Primary Landing Area	A	C-5A	Approximately 9 days prior to EOM	Ellington AFB	North Island	Transport SML	
	B	HC-130	Two days before EOM	McClellan AFB	PRS	Transport medical Isotopes	Airdrop To PRS
	C	C-1A/SH-3	Within COD Range	PRS	March AFB	Transport PAO film	
	D	ARIA	After COD event C arrives North Is.	March AFB	Ellington AFB	Transport PAO film	If ARIA is available
	E	C-141	After PRS inport	North Island	Ellington AFB	Transport flight crew, select experiments and NASA Personnel	
	F	C-5A	After PRS arrives North Is.	North Island	Ellington AFB	Transport SML	
SL-4 Primary Landing Area	G	C-5A	Approximately 28 days prior to EOM	Ellington AFB	Hickam AFB	Transport SML and NASA equipment	
	H	TBA	R-6 days	North Island	PRS	Transport medical personnel	Number TBD

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Manned Mission	Event	Aircraft Type	Time Required	From	To	Purpose	Remarks
SL-4 Primary Landing Area	I	TBA	R-1 days	North Island	PRS	Transport VIP's and Isotopes	Number TBD
	J	<i>Two</i> SH-3	<i>Within COD range</i> <i>081815Z</i>	PRS	<i>CGAS</i> <i>NAS San Diego</i> <i>Miramar</i> <i>NORIS</i>	<i>VIP COD</i> Transport PAO film	<i>VIP COD TERMINATE NORIS</i> <i>PAO FILM TRANSPORT TERM. CGAS</i>
	K	<i>ARIA</i> <i>T-39</i>	When COD event J arrives NAS <i>Miramar</i> <i>NORIS</i>	<i>NAS</i> <i>Miramar</i> <i>NORIS</i>	<i>PATRICK</i> Ellington AFB	Transport PAO film	
	L	TBA	Two days after PRS arrives North Island	North Island	Ellington AFB	Transport flight crew	10 passengers. Requires capability for 3 Astronauts to lie down.
All Missions (SLA)	M	C-5A	Between Launch and PRS deployment with SML	Ellington AFB	Island Base	Transport SML	Remain at Island up to 3 days and return to Ellington AFB.
	N	C-141	As directed	Ellington AFB	Hickam AFB	Transport NASA equipment (Conex boxes).	
	O	C-141	Approximately 2 days after SRS/PRS arrives Pearl Harbor	Hickam AFB	Ellington AFB	Transport spacecraft data and film.	

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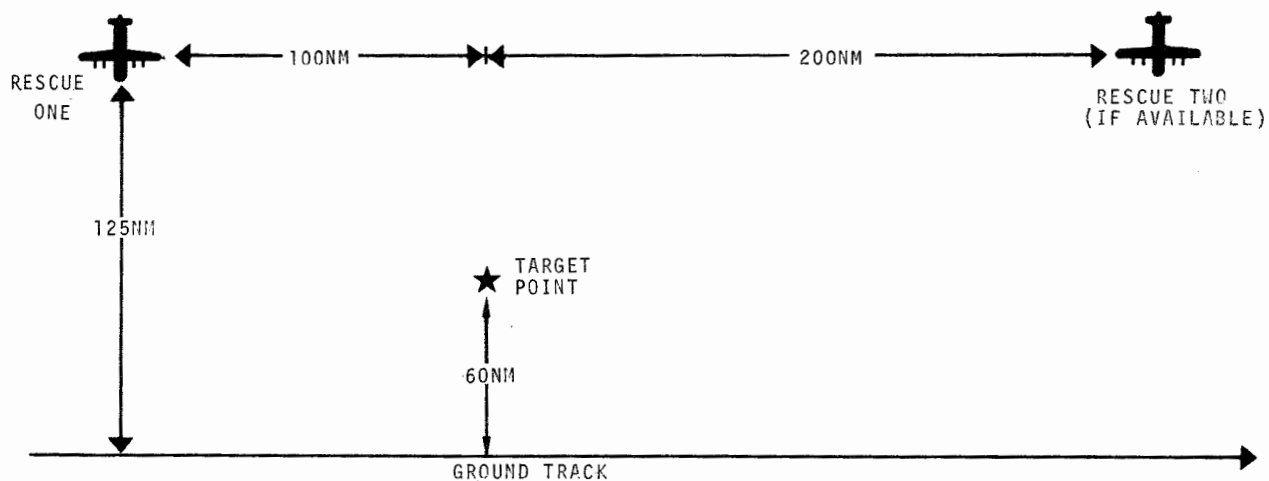
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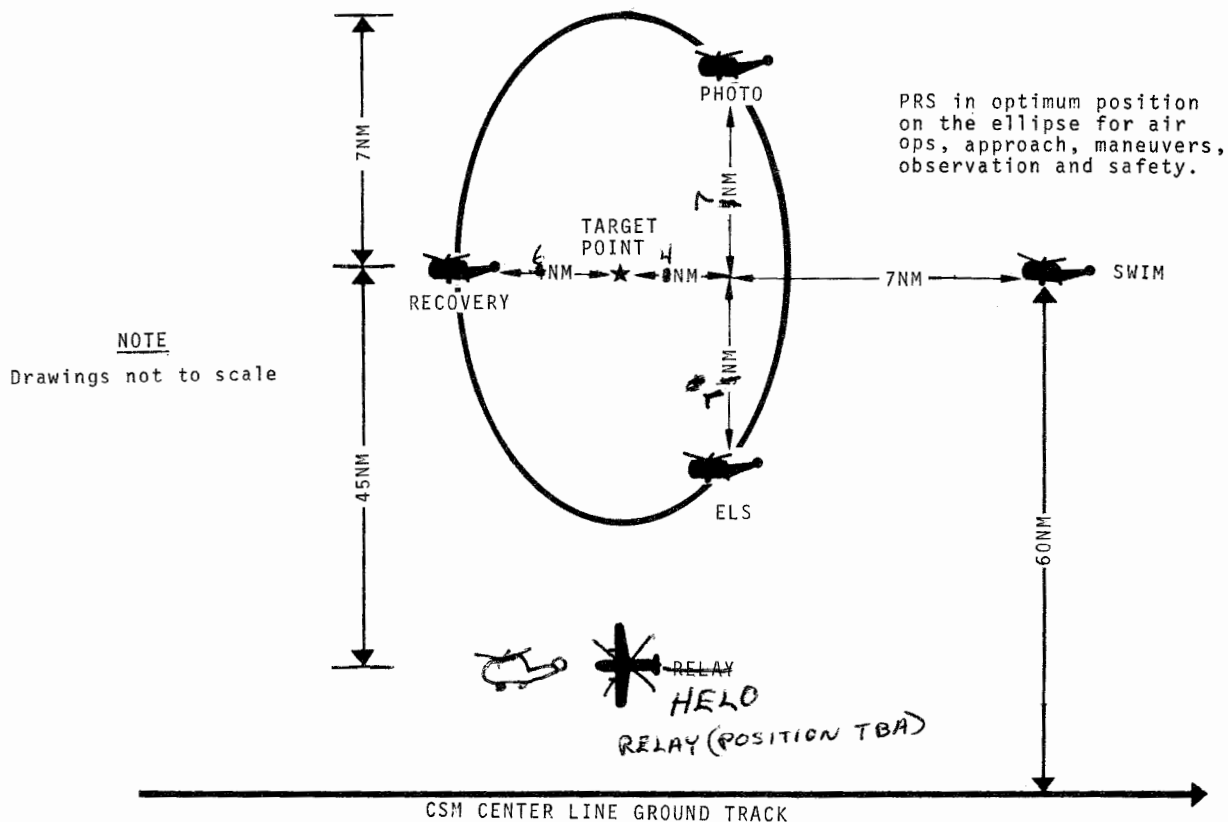
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Appendix II to Annex C
 Support Positioning Illustrations

1. End of Mission Primary Landing Area Rescue Aircraft Array



2. Primary Recovery Ship Aircraft Array

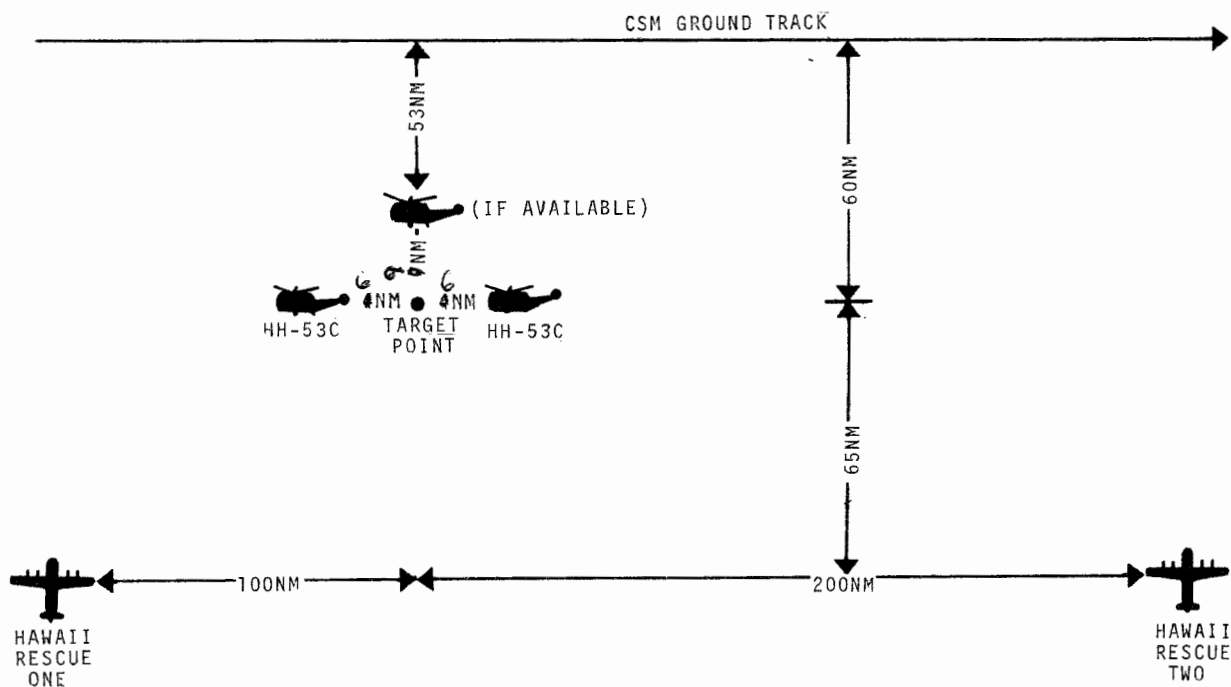


Operation Order

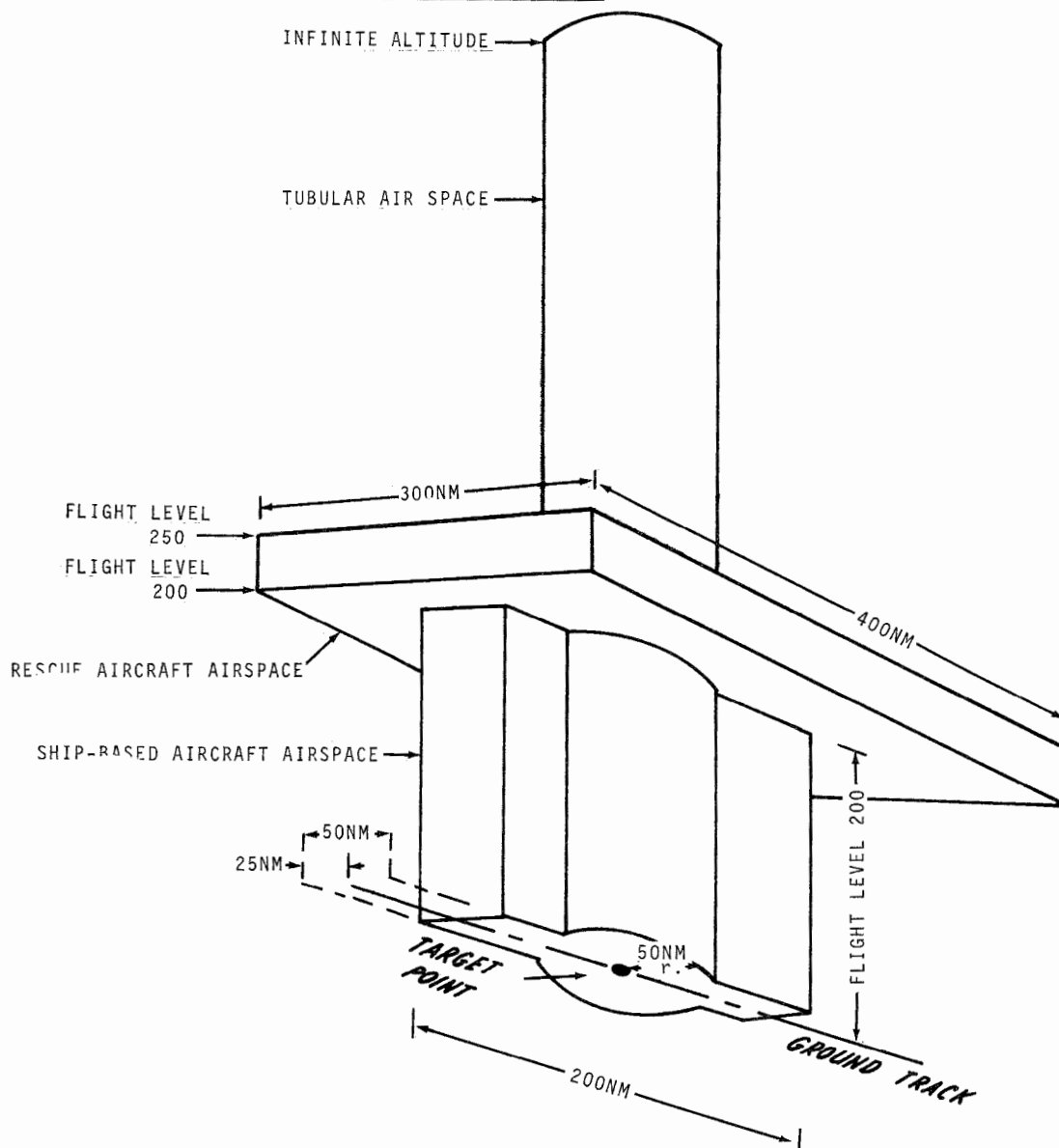
COMNAVSEAFRON No. 342-73

COMNAV DIST

3. Secondary Landing Area Array



4. Illustration of Splinter Shield Construction



Authentication:

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Commander, USN
Manned Spacecraft Recovery Officer

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Pacific (CTF 130)

Appendix III to Annex C
Access and Retrieval Times

Phase of Mission	Area	Access Time (Hours)	Retrieval Time (Hours)
Earth Orbital	Secondary Landing Area	ASAP	Crew 1.3**/CM-ASAP
	Contingency Landing Area	48 *	
End-of-Mission	Primary Landing Area	2	Crew 1.3**/CM-24

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

** Crew retrieval times are based on medical requirements and should be held to the absolute minimum consonant with safe operation.

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Operation Order
~~COMHAWSEAFRON~~ No. 342-73
~~COMNAVIST~~
Reference (a) COMHAWSEAFRON OPLAN 305-72

Appendix IV to Annex C

Post Retrieval Operations

1. General. Post retrieval operations will be as described in Appendix VI, Annex D to reference (a) and as amplified herein.
2. Delivery of the Command Module. In the event of early termination in the SLA, the command module will be transported to Pearl Harbor by the SRS, depressurized by NASA personnel, and trans-shipped on the first available vessel to San Diego for deactivation at NAS North Island. Should earlier CM return be deemed necessary, deactivation will take place at Hickam AFB prior to air shipment arranged by NASA. If retrieved by the PRS, 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, applicable 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.

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- References: (a) Skylab Recovery Requirements (10 April 1973)
(b) COMHAWSEAFRON OPLAN 305-72
(c) DOD MGR for MSFS OPS and NASA MSC FCD Apollo Recovery Operational Procedures Manual, Revision E (10 October 1972)

Annex D

Secondary Landing Area and Contingency Recovery Operations

1. General. Contingency recovery operations will be conducted in accordance with procedures set forth in Annex D to reference (b) 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 62° East longitude. Johnston Island has the capability for C-5/SML operations on a contingency basis. The primary concerns 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 delivering the astronauts to the SML unit within a reasonable time frame.

3. Secondary Landing Area Support. The SLA (secondary landing area) is the area in which the probability of a CM landing is sufficiently high to require pre-positioned forces to retrieve the flight crew. This area is located in the vicinity of the Hawaiian Islands. Recovery force support required for this area includes a C-5A aircraft with the SML aboard, search and rescue aircraft, HH-53C air refuelable helicopters and an SRS (secondary recovery ship).

a. C-5A/SML Requirements. The DOD will be notified if an early mission termination is being considered. However, it is expected that at least a 24-hour mission termination lead time will be available for the transfer of the SML (Skylab Mobile Laboratory), maintained in a ready status at the JSC (Lyndon B. Johnson Space Center), Houston, Texas, to one of three island bases: Barking Sands, Kauai; Hickam AFB, Oahu; or General Lyman Field, Hawaii. The airfield to be used will be dependent upon the target point location. Seven of the 24 hours of lead time are required at the island base to set up and prepare the SML for the arrival of the flight crew. Therefore, of the 24 hours lead time, only 17 hours will be available to call the C-5A, fly it to Ellington AFB, Texas, load the SML and then fly to the island base.

b. Search and Rescue Aircraft Requirements. Search and Rescue aircraft based at Hickam AFB, Hawaii will support the SLA. The 76TH ARRSQ is the assigned ARRS unit at Hickam AFB. From launch through rendezvous, one HC-130 aircraft with a 30 minute reaction time is required to support the target points located in the vicinity of Hawaii. After rendezvous, one aircraft on ARRS SAR alert, Skylab configured, will support this area.

(1) SAR alert (Skylab configured) HC-130 will be configured to perform Skylab recovery support within designated reaction and access times. The aircraft is equipped with the ADDRIS (Aircraft Delivered Drift Reduction System), flotation collars and has a third pararescueman 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 a Skylab recovery mission. Upon notification to launch, the aircraft will be serviced with additional fuel as required. SAR alert (Skylab configured) aircraft are not dedicated to NASA mission support and may perform other ARRS functions from home bases while in the SAR alert posture.

c. HH-53C Helicopter Requirements. Two HH-53C helicopters (a third helicopter is highly desirable) must be prepared to provide retrieval and delivery of the flight crew to the SML in approximately one hour after CM landing. These helicopters should be on alert such that they can be on-station prior to CM landing.

d. SRS (Secondary Recovery Ship) Requirements. An SRS will be required to retrieve the CM and deliver it to Pearl Harbor. This ship will be the duty salvage ship at Pearl Harbor (ARS or ATF). When a decision is made to terminate the mission, the ship will proceed toward the target point and, if it can arrive on-station before CM landing, it will be positioned outside the G & N dispersion area.

4. SLA Search and Recovery Procedures. In the event of a secondary landing, TF 130 recovery operations will involve location of the CM, provision of on-scene assistance, maintenance of contact and astronaut/CM retrieval.

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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. The aircraft should be on-station prior to main parachute deployment. Although not required, if a second aircraft is available it should be positioned as shown in Appendix II to Annex C. The HC-130's should be on the same side of the CSM center-line groundtrack as the target point, departing station to fly inbound to the groundtrack two minutes prior to the predicted end-of-S-band blackout. If S-band blackout time is unavailable, the aircraft should depart station twelve minutes before predicted CM landing time.

b. On-scene Assistance and Maintenance of Contact. If the SRS and helicopters are not in the vicinity, and assuming that appropriate weather conditions (wind and sea state) prevail, pararescue personnel aboard the search aircraft will parachute to the CM and install the flotation collar when directed by CTF 130 or higher authority. In the event that the locating aircraft does not have the pararescue personnel, or operating conditions do not permit deployment, this fact will be reported to CTF 130 and contact will be maintained with the CM to the limit of the aircraft's on-station endurance. Additional aircraft will be launched to provide on-scene assistance and maintenance of contact until the arrival of helicopters and an SRS.

c. Retrieval. The flight crew will be retrieved by helicopter and delivered to the SML. After a maximum of three days at the island base, a C-5A will fly the flight crew and the SML back to Ellington AFB, Texas. The SRS will retrieve the CM and deliver it to Pearl Harbor.

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

6. Contingency Landing Area. The contingency landing area, defined as the area around the Earth in a band between 50° North and 50° South latitudes that lies outside the primary and secondary landing areas, has such a low probability for landing that only home-based search and rescue aircraft support is warranted. Recovery force support for this PACOM area will be provided by the aircraft supporting the secondary landing area and one ARRS SAR alert aircraft (Skylab configured), at Clark AB, Philippines, and another at Kadena AB, Okinawa. Air-refuelable helicopters at ARRS bases may be required to retrieve the flight crew if a CM landing occurs within their operational range capabilities. A ship-of-opportunity in the vicinity of the recovery operation which has the capability of astronaut and/or CM recovery may be tasked to effect the retrieval.

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Commander, USN

Manned Spacecraft Recovery Officer

Operation Order
COMFOURTEEN No. 342-73

Reference (a) COMHAWSEAFRON OPLAN 305-72

Annex E

Communications

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

a. Communications will be in accordance with NWP 16 (D) and appropriate joint, allied, USAF and USN publications. NWP 16 (D) 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 Skylab IV recovery operations provide for four basic situations. These plans and their respective Appendices are as follows:

- | | |
|--|--------------|
| (1) <u>PRS (Primary Recovery Ship) Communications</u> | Appendix I |
| (2) <u>Primary Landing Area Communications</u> | Appendix II |
| (3) <u>Secondary Landing Area (Fence Bases) Communications</u> | Appendix III |
| (4) <u>Contingency Landing Communications</u> | Appendix IV |

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

e. The Pacific RCC (Recovery Control Center) will be manned continuously from 24 hours prior to launch until completion of the 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 JSC FC7 MSG 8204/122055Z MAY 73

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. Commencing 24 hours prior to launch the restoration priority is automatically raised to 1(f) until the mission is completed. Nothing in this Operation Order precludes normal restoration procedures to ensure continuity of communications or quality engineering improvements of circuits.

i. Entry into the DOD (Department of Defense) voice communications systems for the transmission of urgent operational traffic is authorized. For this purpose, existing precedence 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 MSFS OPS (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 activation schedules shall be reported to CTF 130 immediately.

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

n. Circuit Control

(1) To coordinate frequency shifts and restoration procedures of recovery force circuitry, circuit control is vested in the NAVCOMMSTA (Naval Communications Station) maintaining the PRS ship/shore/ship termination. This control relates specifically to the following circuits:

- (a) PRS ALFA (VOX)
- (b) Command and Control (TTY)
- (c) Press (TTY)
- (d) Orderwire (TTY)
- (e) Ship/shore (TTY)

(2) Circuit control for the following recovery force circuits is vested with NAVCOMMSTA Honolulu throughout the mission.

- (a) Circuit NOVEMBER (VOX)

~~(b)~~ SRS (Secondary Recovery Ship) ALFA (VOX)

(3) CTF 130 performs circuit control functions for circuit HOTEL (VOX) throughout the mission.

(4) The PRS performs circuit control functions for circuit ROMEO (VOX) and circuit INDIA (VOX) throughout the mission.

o. All circuit outages or other communications problems affecting the recovery mission shall be reported immediately to CTF 130 by whatever means available. Operational circuits such as PRS ALFA, will not be seized for such reports without prior permission from CTF 130.

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 ensure that all traffic has been receipted for before requesting permission to secure from a particular circuit.

r. The RCC Pacific shall coordinate the securing of circuits between CTF 130 and the PRS.

2. Emission Control. 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 Skylab IV recovery operations are exempt from authentication requirements. This exemption also applies to Skylab messages sent on other non-Skylab circuits.

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

5. Call Signs. Special descriptive and UNCLASSIFIED Skylab voice call signs will be used in accordance with Appendix VI 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 broadcasts.

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. ATS (Applications Technology Satellite) Communications. ATS communications will be in accordance with Appendix I.

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

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

12. Amateur Radio Operations. Due to the unique status of afloat forces engaged in Skylab recovery missions, CINCPACFLT has authorized amateur radio operations from Skylab primary recovery ships. These operations are authorized from PRS departure from San Diego for the mid-Pacific 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. Amateur radio operations are not authorized during PRS inport periods.

13. Commercial Message Traffic. Commercial message traffic entitled to "Class D" privilege will be transmitted "DPR COLLECT" only. Procedures will be in accordance with DNC-26 (B). Commercial message traffic entitled to "Class E" privilege will be accepted on a "cash only" basis and transmitted in accordance with procedures contained in DNC-26 (B).

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

15. COMMSITREPS (Communications Situation Reports)

a. Daily COMMSITREPS will be required from the PRS in accordance with the following format:

O (DTG)

FM USS (Primary Recovery Ship)

TO CTF ONE THREE ZERO

BT

UNCLAS //NO2010//

SKYLAB IV COMMSITREP (RADAY)

A. CTF 130 OPORD 342-73

1. REPORT OF TOTAL PRS COMM SUPPORT HERewith SUBMITTED IAW REF A:

A. HF CIRCUITS:

(1) VFCT TERM: SEND (PERCENT), RECV (PERCENT).

(2) BCST: (PERCENT) NOS. MISSED, VIA WHICH PATH.

(3) PRS ALFA: SEND (PERCENT), RECV (PERCENT).

(4) CKT NOVEMBER: IF ACTIVATED, SEND/RECV PERCENTAGES.

(5) CKT ROMEO: QUALITY, TEST CONDUCTED.

(6) FAX: PROBLEMS, FLOATERS IF USED.

(7) ISB: TIME FRAME USED, TIME FRAMES WITH MORE THAN TWO TRANSMITTERS ON THE AIR AND HOW MANY, OTHER EMISSIONS IF USED AND HOW LONG.

B. ATS: QUALITY OF CKT DURING EACH SKED TRANSMISSION, ANY PROBLEMS ENCOUNTERED.

C. UHF/VHF: PROBLEMS.

D. PRESS: NOS. SENT DURING RADAY, LAST NO. SENT.

E. TV POOL: TESTS CONDUCTED, PROBLEMS ENCOUNTERED.

F. MUTUAL RADIO: (NO.) PHONE PATCHES COMPLETED, TESTS, ANY PROBLEMS.

G. NAVY/MARINE MARS:

(1) PHONE PATCHES (NO.).

(2) MARSGRAMS: SENT (NO.), RECD (NO.).

- H. G. E.: PROBLEMS ENCOUNTERED, PHONE PATCHES (NO.).
- I. RFI: REPORT ALL INSTANCES; IF CORRECTED; IF NOT, ACTION TAKEN TO LOCALIZE AND CORRECT; MAY BE REPORTED ABOVE IF RELATED TO ANY SUBPARA TOPICS.
- J. PROPAGATION: GENERAL EVALUATION AS EXPERIENCED IN REAL TIME; VALUE OF UPR-2 IONOSPHERIC SOUNDER.
- K. REMARKS: INCLUDE ANY PERTINENT ITEMS.

BT

b. Daily COMMSITREPS will be required from those NAVCOMMSTAs that provide mission support. NAVCOMMSTA San Diego assistance should be incorporated into NAVCOMMSTA San Francisco's report. Format will be as follows:

O (DTG)

FM NAVCOMMSTA (SAN FRANCISCO or HONOLULU)

TO CTF ONE THREE ZERO

BT

UNCLAS //NO2010//

SKYLAB IV COMMSITREP (RADAY)

A. CTF 130 OPORD 342-73

1. IAW REF A, COMMSITREP HERewith SUBMITTED:

A. PRS SUPPORT

(1) HF CIRCUITS:

(A) VFCT TERM: SEND (PERCENT), RECV (PERCENT), OUTAGES.

(B) PRS ALFA: SEND (PERCENT), RECV (PERCENT), OUTAGES.

(C) CKT NOVEMBER: IF ACTIVATED, SEND/REC PERCENTAGES AND OUTAGES.

(D) ISB: TIME FRAME USED, TIME FRAMES WITH MORE THAN TWO TRANSMITTERS OR RECEIVERS ON THE AIR AND HOW MANY.

(2) PRESS: NO. RECD DURING RADAY, LAST NO. RECD.

(3) PROPAGATION: GENERAL EVALUATION.

(4) REMARKS: INCLUDE ANY PERTINENT ITEMS SUCH AS EXTENDED OUTAGES, RESTORATION PROCEDURES, EQUIPMENT DIFFICULTIES, POWER FAILURES, ADDITIONAL ASSETS UTILIZED E.G., SAN DIEGO ASSETS, MOLOKAI RCVRS, ETC.

B. SRS SUPPORT

(1) SRS ALFA: SEND (PERCENT), RECV (PERCENT), OUTAGES.

C. AIRCRAFT SUPPORT:

(1) CKT HOTEL: SEND (PERCENT), RECV (PERCENT), OUTAGES.

D. REMARKS: INCLUDE ANY PERTINENT ITEMS.

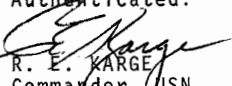
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NAVCOMMSTAs report only those items in above format that are applicable to each RADAY's operation.

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Commandant, Fourteenth Naval District and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)

Authenticated:


R. E. KARGE
Commander, USN
Manned Spacecraft Recovery Officer

Appendices:

- I - Communications Plan for the Primary Recovery Ship
- II - Communications Plan for the Primary Landing Area
- III - Communications Plan for the Secondary Landing Area (Fence Bases)
- IV - Recovery Communications Plan in Support of a Contingency Landing
- V - Frequency Plan and Guard Assignments
- VI - Call Signs
- VII - Astronaut Communications Recording
- VIII - Press Communications

Appendix I to Annex E

Communications Plan for the Primary Recovery Ship

1. General. To provide the required voice and record teletype communications with the PRS, a full period ship/shore/ship termination will be established with NAVCOMMSTA Honolulu. This termination will be HF (high frequency), SSB (single sideband), full duplex, 6A9B ISB (independent sideband) emission utilizing two independent 3 kHz sidebands. One 3 kHz sideband will be utilized for voice and the other 3 kHz sideband for multichannel VFTG (Voice Frequency Telegraphy) RATT. The termination will be shifted to NAVCOMMSTA San Francisco prior to a normal EOM (end of mission) recovery.

a. Voice Communications. To provide the required voice communications for the PRS, the following circuits will be utilized.

(1) Command and Control

(a) The primary means of voice communication between CTF 130 and the PRS throughout the mission shall be the high frequency Command and Control voice circuit designated "PRS ALFA". This circuit will occupy one 3 kHz sideband of the PRS ship/shore/ship termination and thence be extended to the RCC Pacific via dedicated landlines. The circuit will be terminated in AN/FTA-15 telephone terminal equipment aboard the PRS and at the RCC Pacific and should be available at remote locations on the PRS which provide the talker an unobstructed view of recovery operations. Circuit control will be exercised by the NAVCOMMSTA maintaining the ship/shore/ship termination. An alternate route for the "PRS ALFA" circuit will be via NAVCOMMSTA San Diego should assistance be requested. Frequencies for "PRS ALFA" will be taken from the appropriate section of Appendix V. The above circuitry is depicted in Tab A.

(2) NASA Voice Communications

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

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

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

3. SML (Skylab Mobile Laboratory). Upon loading of the SML at Pearl Harbor the following communications installations are required in the SML:

a. A three instrument radio handset adaptor with three radio handsets, required during simulation exercises, actual recovery and post-retrieval periods.

b. A ship's service telephone which is required at all times.

(b) The NASA RECOVERY COMMON circuit will be activated on a scheduled basis. A typical schedule would be as follows:

1. One 2-hour period daily from 1000 to 1200 PRS local time.

2. One hour prior to entry interface until 12 hours after splash.

In the event the NASA RECOVERY COMMON 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.

(c) The NASA RECOVERY COMMON circuit, depicted in Tab B, shall be activated via the ATS terminal during scheduled times in accordance with subparagraph 1.a.(3). During contingencies or non-scheduled satellite time, circuit NOVEMBER will be activated if the need should arise. NAVCOMMSTA Honolulu will exercise circuit control of circuit NOVEMBER throughout the mission.

1. Circuit NOVEMBER will consist of an HF SSB (3A3J) full duplex voice circuit terminated in AN/FTA-15 telephone terminal equipment on the PRS and the RCC Pacific. Bridging of this circuit will be accomplished at the RCC Pacific to facilitate a three-way conference arrangement between ROCR Houston, RCC Pacific and the PRS. Circuit NOVEMBER is depicted in Tab B. Frequencies will be taken from the circuit ALFA and circuit HOTEL listings in Appendix V.

(d) 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. The NASA surgeon on board the recovery helicopter will also require direct talk-and-monitor capability on the Astro Voice circuit.

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

1. Command and Control voice circuit
2. NASA RECOVERY COMMON circuit
3. Astronauts Voice Circuit (handset required during simulations only)
4. Helicopter Control Circuit (handset required when simulating helicopters

only)

(f) During all inport periods NASA personnel on board the PRS will require a private class "A" telephone line, independent of the PRS telephone switchboard, located in the NASA office space. Upon return to port from EOM a second black phone connected to this same line with the same telephone number will be required in the Nutrition and Endocrinology Laboratory of the SML.

(3) Satellite Communications

(a) ATS 1 and 3. The ATS-1 and ATS-3 satellites will be utilized in support of Skylab IV. The satellites are controlled by the NASA ATSOCC (ATS Operations Control Center) at Goddard Space Flight Center, Maryland. These are VHF transponder type satellites. Operations in support of Skylab will be on 149.245 MHz uplink and 135.575 MHz downlink. The satellites will be scheduled to provide one voice channel to CTF 130 for four hours per day and twelve hours on recovery day. During these periods the ATS circuit will be used for NASA RECOVERY COMMON or Command and Control purposes as designated by CTF 130. During scheduled satellite time, NASA medical personnel on board the PRS will require use of the NASA RECOVERY COMMON circuit for bio-medical data tests and transmissions between the PRS and MCC Houston. Bio-medical data tests and transmissions will be conducted on a scheduled basis. A typical schedule would be as follows:

1. From 1100 to 1200 PRS local time on R-6, R-3 and R-1 days.
2. On recovery day from splash + 6 hours to splash + 10 hours.

(b) The PRS ATS terminal will be housed in two specially configured Conex boxes 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 RCIC (Recovery Communications Interface Console) and the ship's normal patching system. Satellite circuitry is depicted in Tabs B and C of this Appendix.

(4) Astronaut Voice Circuit

(a) The Astronaut Voice Circuit, 296.8 MHz (primary) and 259.7 MHz (secondary) will be used for coordination of astronaut recovery.

1. If problems are encountered on 296.8 MHz the astronauts will shift to a secondary transceiver and operate on 259.7 MHz.
2. In the event of failure of normal UHF 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. Voice contacts on the emergency frequency 243.0 MHz will be immediately reported to CTF 130.

(b) 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 the secondary frequency 259.7 MHz.

(c) Relay aircraft will provide UHF/HF SSB relay of the Astronaut Voice Circuit to CTG 130.1. The HF portion of the relay path is designated "Circuit ROMEO" and is depicted in Tab D. Frequencies for Circuit ROMEO will be taken from the appropriate section of Appendix V.

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(5) Ship-to-Air/Air-to-Air Communications. A supporting communications plan will be promulgated by CTF 130.1 to provide circuits and frequencies to be used with PRS aircraft.

(a) Circuit INDIA. The primary means of communication between the PRS and USAF recovery aircraft is by the UHF/HF air-to-ground circuit designated "Circuit INDIA". This circuit is depicted in Tab E. Frequencies for Circuit INDIA will be taken from the appropriate section of Appendix V.

(6) Presidential/VIP Calls. Shortly after the astronauts are on board 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 and would therefore utilize the existing NASA RECOVERY COMMON circuit. The call will be coordinated by CTF 130 communications personnel in conjunction with the communications representatives at Cape Kennedy and the White House. Additional paths for this call exist through the HF Command and Control voice circuit or, if activated, the HF NASA voice circuit, "Circuit NOVEMBER". End-to-end testing of both the ATS NASA RECOVERY COMMON path and an HF path will be conducted on a scheduled basis for R-2 day and again on R-1 day. Circuit configuration for the VIP calls will be promulgated by CTF 130 to the PRS in sufficient time for communications personnel on board the PRS to make necessary preparations.

b. Teletype Communications. To provide the required record teletype communications capability for the PRS the following circuits will each occupy one channel of the PRS multi-channel VFTG shore termination.

(1) Command and Control Teletype. A full duplex, UNCLASSIFIED teletype circuit between CTF 130 and the PRS. (NOTE: This circuit is operated half-duplex send/receive at the RCC Pacific.)

(2) Press Teletype. A full duplex, UNCLASSIFIED press teletype circuit will be required upon departure of the PRS from San Diego for EOM. Press copy will be filed by the PRS directly to NAVCOMMSTA San Francisco where it will be screened for completeness prior to onward transmission to CTF 130 and the Skylab News Centers at Cape Kennedy and Houston.

(3) Circuit Routing. In addition to the NAVCOMMSTA Honolulu and NAVCOMMSTA San Francisco routing of the Command and Control and Press Teletype circuitry, an alternate route is available through NAVCOMMSTA San Diego should assistance be requested. The above teletype circuits are depicted in Tab F and Tab G.

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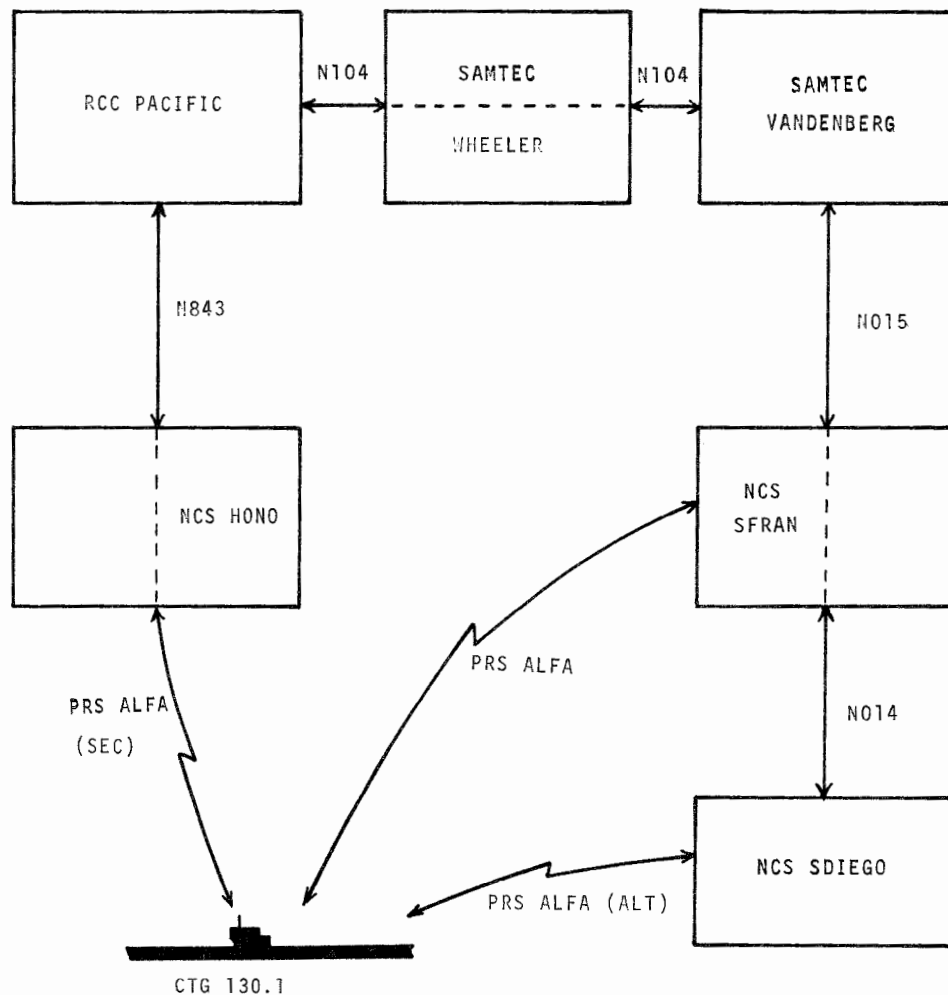
Authenticated:


R. L. KARGE
Commander, USN
Manned Spacecraft Recovery Officer

Tabs:

A	-	Command and Control Voice "PRS ALFA"
B	-	NASA Recovery Common Circuit
C	-	ATS Communications
D	-	Circuit ROMEO
E	-	Circuit INDIA
F	-	Teletype Circuits - PRS in East Pacific
G	-	Teletype Circuits - PRS in Mid-Pacific

Tab A to Appendix I to Annex E
Command and Control Voice "PRS ALFA"

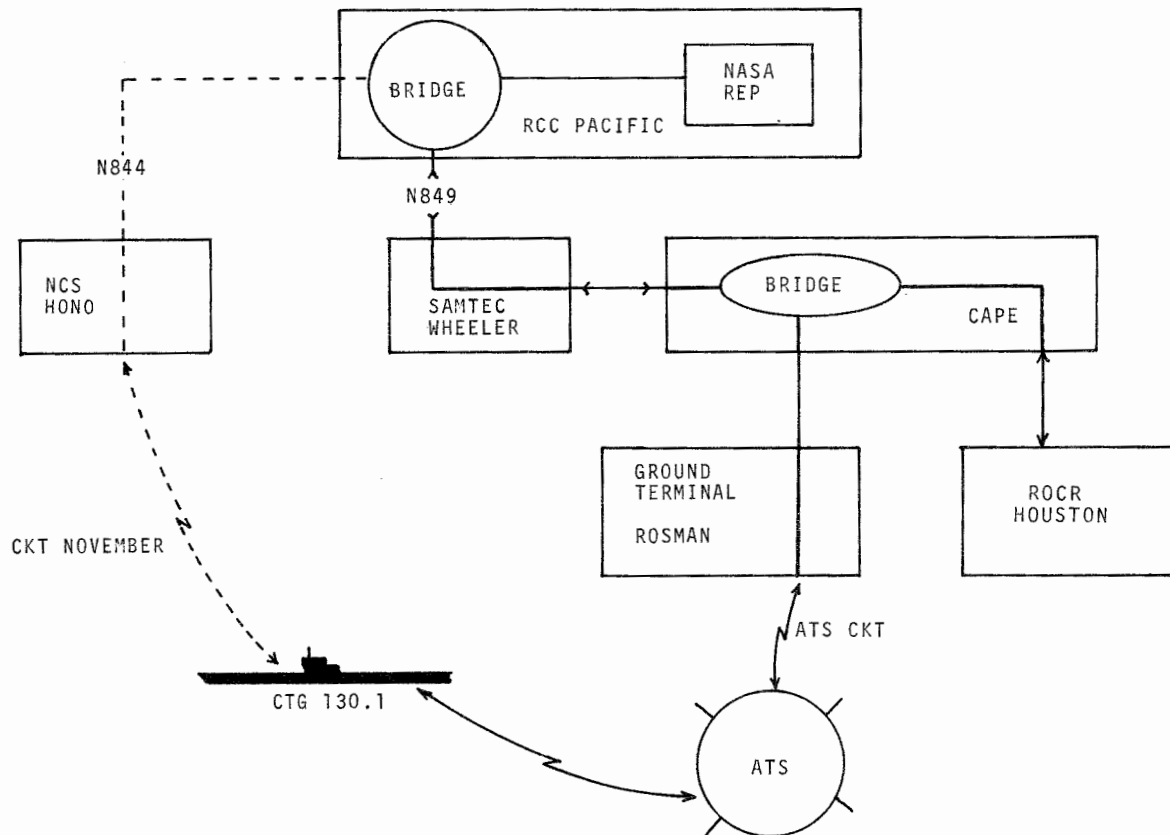


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Tab B to Appendix I to Annex E
NASA Recovery Common Circuit



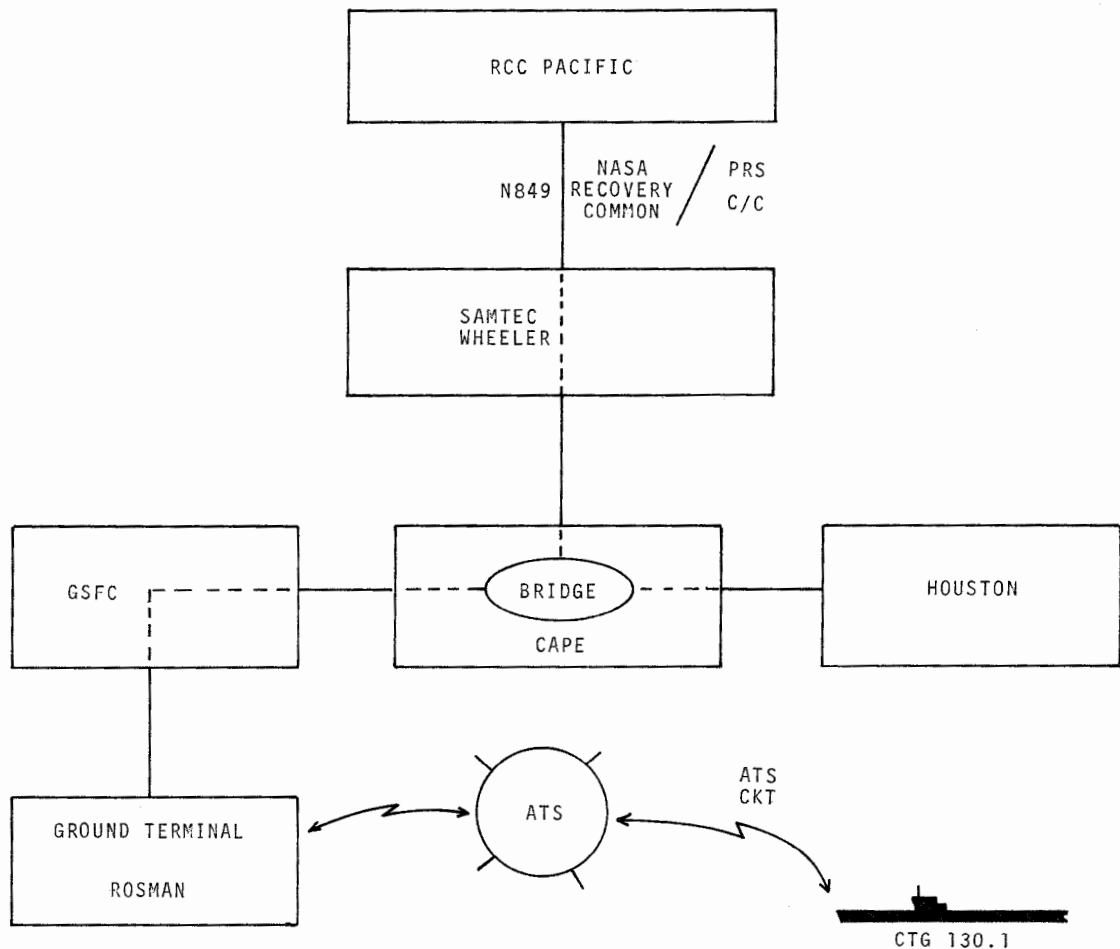
DASHED LINE INDICATES CIRCUIT
NOVEMBER WHICH MAY BE ACTIVATED
IN LIEU OF THE ATS CKT

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Tab C to Appendix I to Annex E
ATS Communications



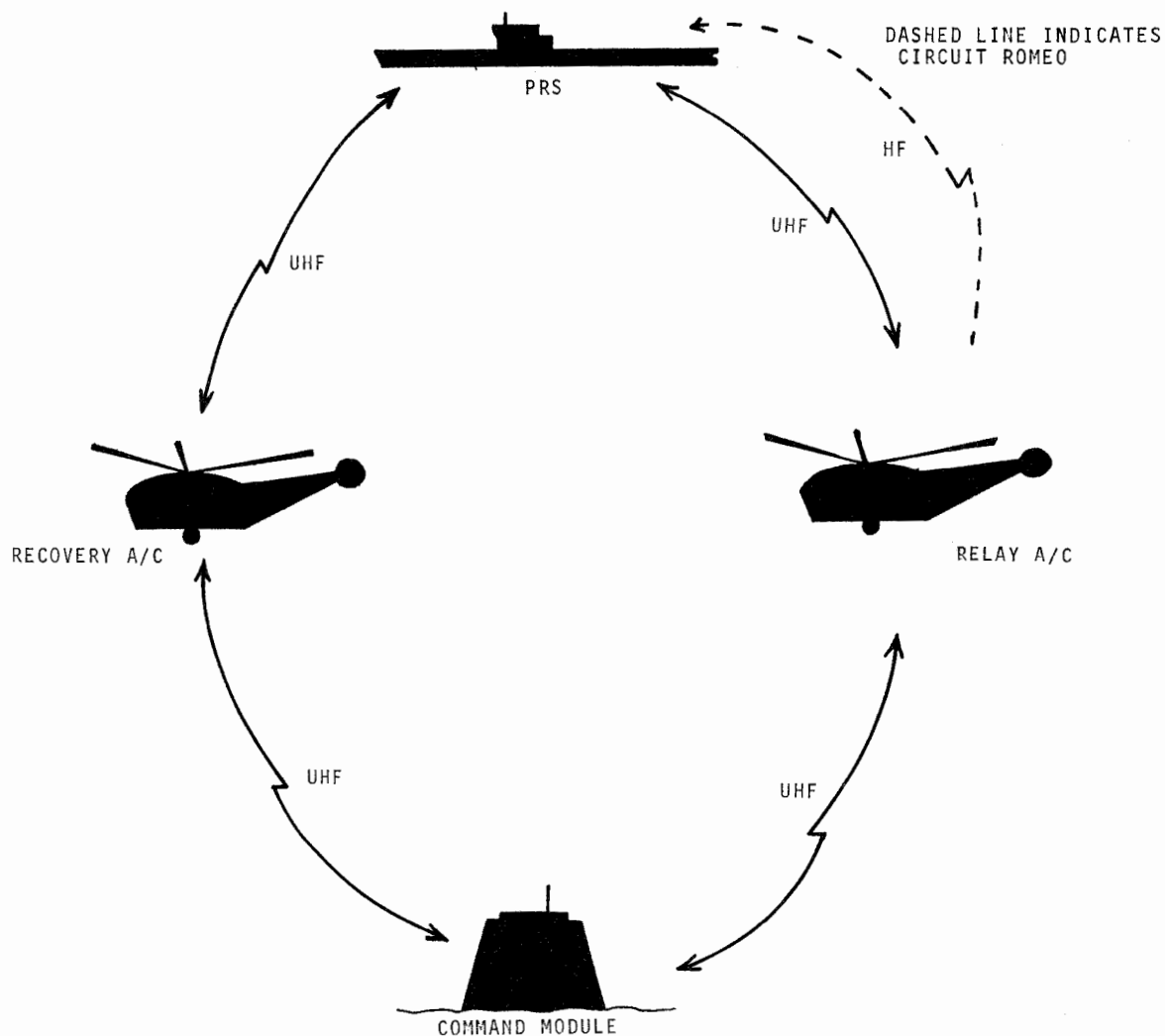
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Tab D to Appendix I to Annex E

Circuit ROMEO



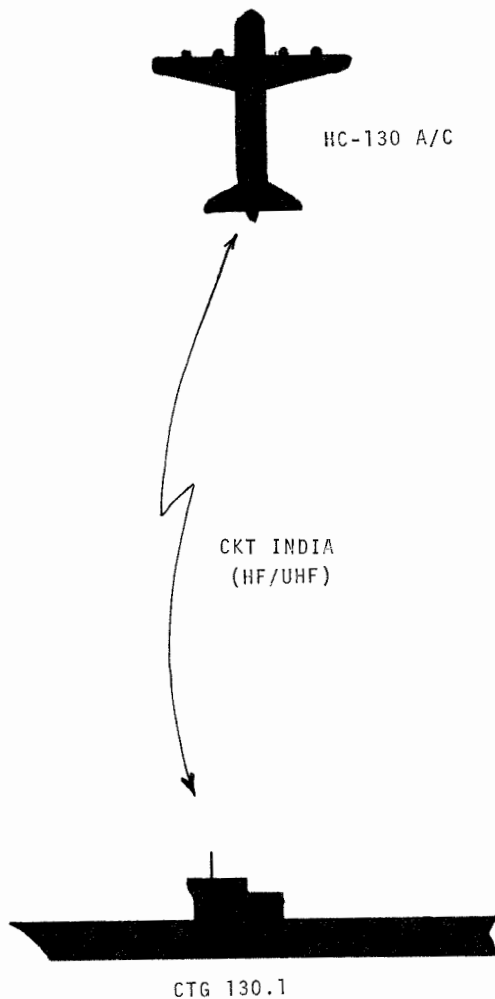
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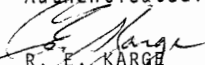
Tab E to Appendix I to Annex E

Circuit INDIA

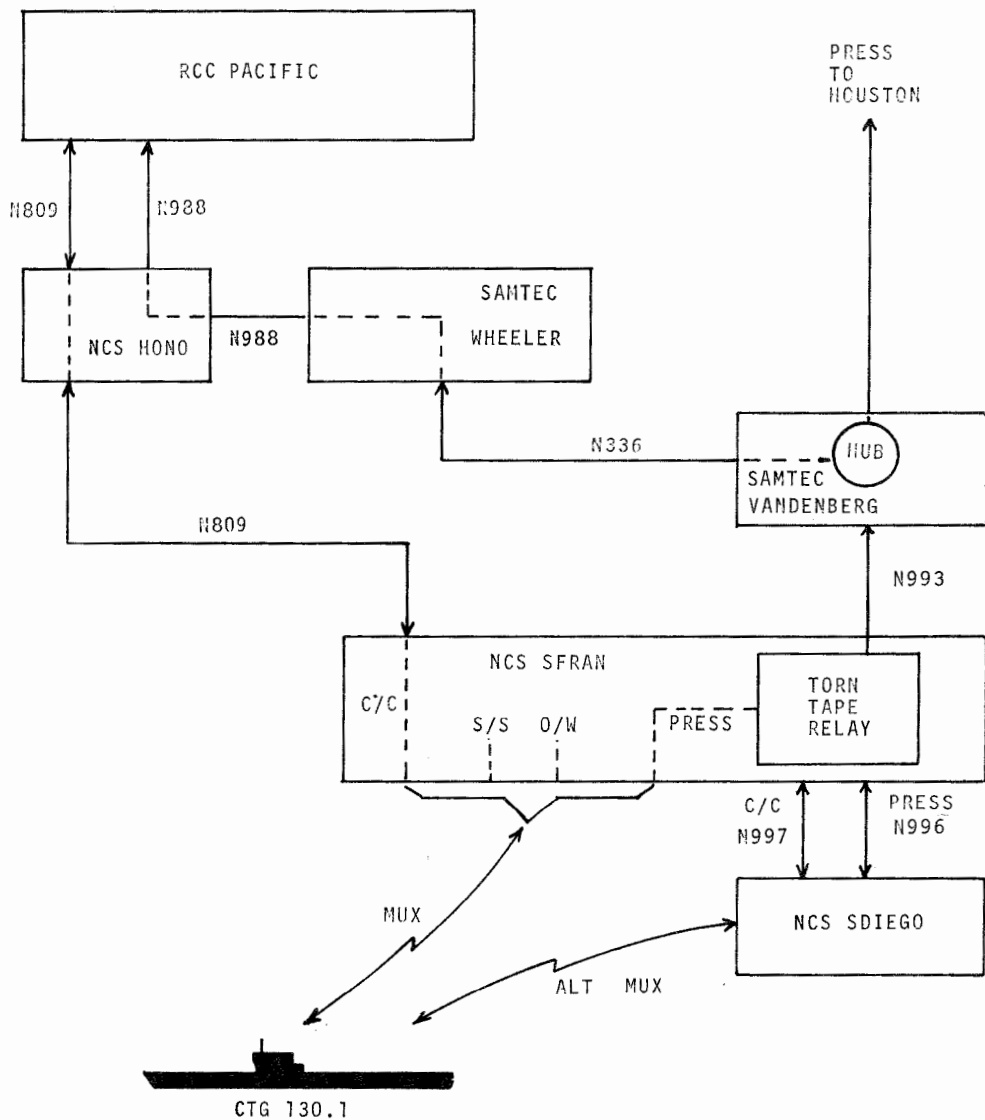


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Tab F to Appendix I to Annex E
Teletype Circuits - PRS in East-Pacific

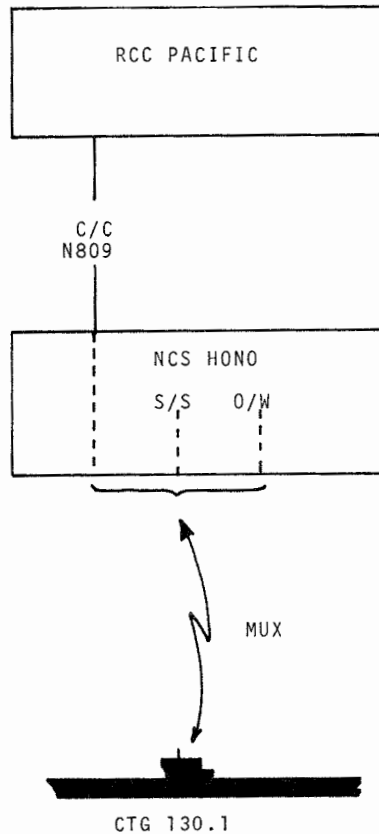


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Tab G to Appendix I to Annex E
Teletype Circuits - PRS in Mid-Pacific



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Appendix II to Annex E

Communications Plan for the Primary Landing Area

1. General. The communications plan in support of the primary landing area provides for communications between CTF 130, CTG 130.1, CTG 130.4 and units of the recovery forces in the recovery area.

a. Surface Recovery Force Communications

(1) The communications plan in support of the PRS during normal EOM recovery operations in the primary landing area is contained in Appendix I to this Annex.

b. Land-based Air Search Group Communications

(1) Sub-Recovery Control Centers. The SRCCs control the land-based aircraft that support recovery operations in the primary landing area. The SRCC at McClellan Air Force Base, California will support recovery operations in the primary landing area for Skylab IV.

(2) SRCC COMMON (Circuit HOTEL)

(a) The primary means of communication between CTF 130/CTG 130.4 and the land-based aircraft in the primary landing area shall be by HF SSB (3A3J) voice radio. This circuit is designated "Circuit HOTEL" and is depicted in Tab A. Frequencies for Circuit HOTEL will be taken from the appropriate section of Appendix V.

(b) CTF 130 will key two transmitters at NAVCOMMSTA Honolulu in support of Circuit HOTEL.

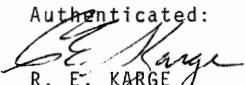
(c) Communications between CTG 130.4 and the 41ST ARRSQ (Aerospace Rescue and Recovery Squadron) located at McClellan AFB, California will be via AUTOVON.

(3) Circuit INDIA

(a) The primary means of communication between the PRS and USAF recovery aircraft is by UHF/HF air-to-ground circuit designated "Circuit INDIA". This circuit is depicted in Tab A. Frequencies for Circuit INDIA will be taken from the appropriate section of Appendix V.

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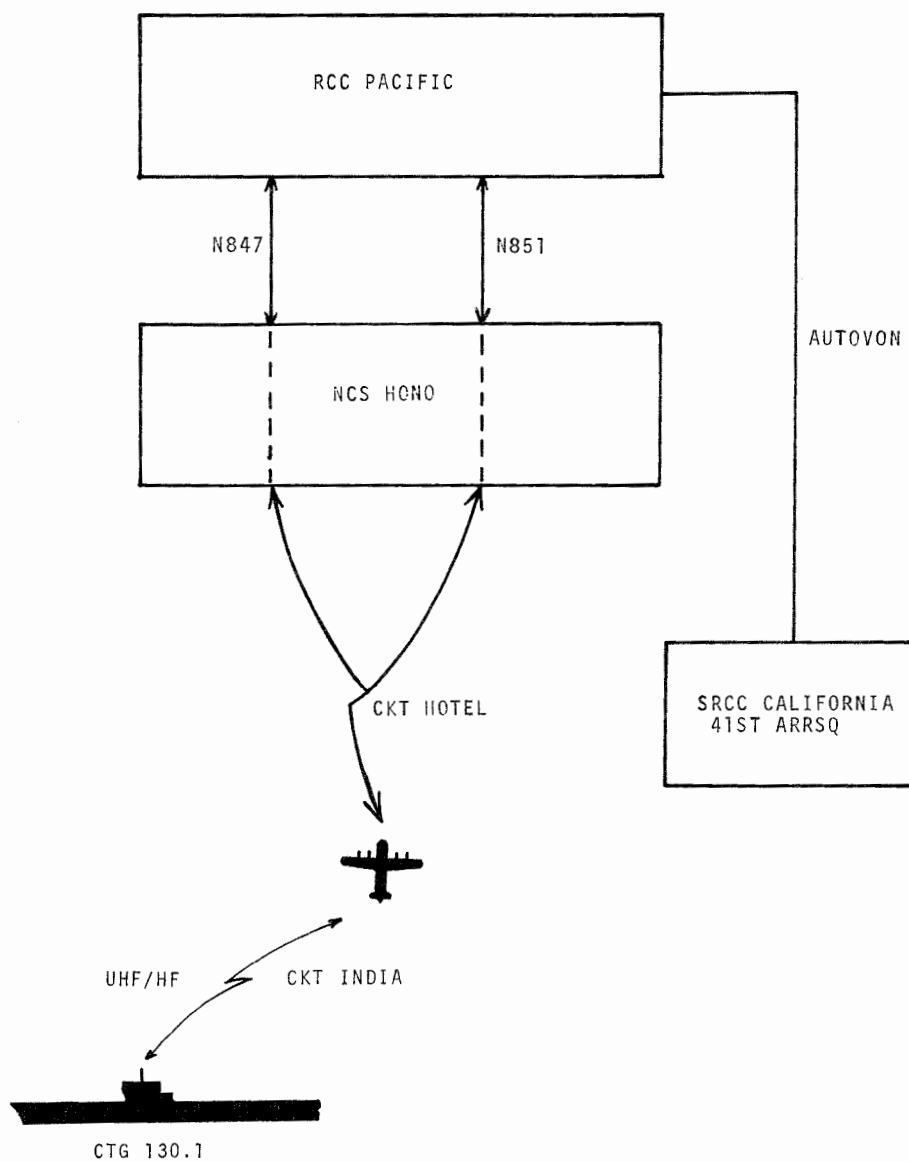
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Tabs:

A - SRCC Common Circuit HOTEL and Associated Circuits

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



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Reference (a) COMHAWSEAFRON OPLAN 305-72

Appendix III to Annex E

Recovery Communications Plan for the Secondary Landing Area (Fence Bases)

1. General. The communications plan in support of the SLA (Secondary Landing Area), fence bases, provides communications between CTF 130, CTG 130.2, CTG 130.4, the SRCCs and the NASA personnel in the SML aboard the C-5 aircraft at the specified fence base.

2. Surface Recovery Force Communications

a. PRS Communications

(1) The PRS (CTG 130.1) will deploy to the SLA to onload the SML and cover mid-Pacific target points prior to the normal EOM recovery. The communications plan in support of the PRS during this period is contained in Appendix I to this Annex.

b. SRS Voice Communications

(1) The primary means of communication between CTF 130 and the SRS shall be by HF SSB (3A3J) voice radio. This circuit, designated "SRS ALFA", is depicted in Tab A. Frequencies will be taken from the appropriate section of Appendix V.

(a) CTF 130 will key two transmitters at NAVCOMMSTA Honolulu in support of the "SRS ALFA" circuit.

(b) The NASA representative on board the SRS may desire to share the "SRS ALFA" circuit to pass traffic to the NASA representative at the RCC Pacific and will be accommodated on a not-to-interfere basis with operational communications.

(2) The SRS will provide a receive monitor of Circuit HOTEL with a speaker located on the bridge.

c. Air-to-Ground Communications

(1) The primary means of communication between the SRS and USAF recovery aircraft is by the UHF/HF air-to-ground circuit designated "Circuit INDIA". This circuit is depicted in Tab A. Frequencies for Circuit INDIA will be taken from the appropriate section of Appendix V.

3. Land-Based Air Search Group Communications

a. The SRCCs control the land-based aircraft that support recovery operations in the secondary landing area (fence bases) or in the event of a contingency landing. The SRCC at Hickam Air Force Base, Hawaii will support operations in the secondary landing area (fence base) for Skylab IV.

b. SRCC COMMON (Circuit HOTEL)

(1) The primary means of communication between CTF 130/CTG 130.4 and the land-based aircraft in the secondary landing area shall be by HF SSB (3A3J) voice radio. This circuit, designated "Circuit HOTEL", is depicted in Tab B. Frequencies for Circuit HOTEL will be taken from the appropriate section of Appendix V.

(a) CTF 130 will key two transmitters at NAVCOMMSTA Honolulu in support of Circuit HOTEL.

(b) Communications with TG 130.4 units at Hickam AFB, Hawaii will be via the Pacific Air Force Switchboard at Hickam AFB. The RCC Pacific and PACAF switchboard will be connected via direct line.

(c) The helicopter designated SWIM will utilize Circuit HOTEL to provide narration of recovery operations.

c. 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 secondary transceivers operating on 259.7 MHz.

Operation Order
COMFOURTEEN No. 342-73

(b) In the event of failure of normal UHF equipment in the CM (296.8 MHz and 259.7 MHz), or for emergency actions, the astronauts will use their survival radios which operate on 243.0 MHz. Voice contacts on the emergency frequency 243.0 MHz will be immediately reported to CTF 130.

4. Fence Base Communications Network

a. Fence Bases. In the event of a landing in the secondary landing area, prior to the arrival of the PRS, and dependent upon the CM target point, one of the following fence bases will be utilized to support the transfer of the Skylab crew from the HH-53 aircraft to the waiting C-5 aircraft which will contain the SML:

- (1) General Lyman Field, Hilo, Hawaii
- (2) Hickam Air Force Base, Honolulu, Hawaii
- (3) Barking Sands, Kekaha, Kauai, Hawaii
- (4) Johnston Island (contingency fence base)

The HH-53 helicopter transporting the Skylab crew to the waiting SML will contact the C-5 aircraft while inbound on 296.8 MHz for coordination purposes.

b. The SML will contain an acoustical med-data/voice handset in addition to a standard black dial-in telephone. Upon arrival, SML NASA personnel will provide the necessary cabling to connect the SML with the fence base utility panel which is located at the C-5 parking area. The fence base utility panel contains a standard 2-wire telephone jack connected for dial-in to the local common user telephone system and, (with the exception of General Lyman Field, Hilo, Hawaii), a 4-wire voice jack connected to the local communications facility. The 4-wire circuit will be extended to SAMTEC Wheeler AFB or to FOCCPAC, Kunia for interface with the NASA RECOVERY COMMON circuit to provide med-data operation and voice communication with MCC Houston.

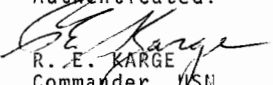
c. A portable ATS terminal aboard the C-5 aircraft will provide backup capability for the 4-wire NASA circuit at all of the fence bases having the 4-wire capability. No 4-wire circuitry will be available at General Lyman Field, Hilo, Hawaii. Accordingly, the portable ATS terminal will support NASA voice and med-data operations at that base.

d. The above circuitry is depicted in Tab C.

e. The following commercial telephone numbers will be used at the four fence base utility panels in the secondary landing area:

- | | |
|--|---------------------|
| (1) General Lyman Field, Hilo, Hawaii | Hawaii 808-935-1991 |
| (2) Hickam AFB, Honolulu, Hawaii | Hawaii 808-449-5650 |
| (3) Barking Sands, Kekaha, Kauai, Hawaii | Hawaii 808-471-6350 |
| (4) Johnston Island (contingency fence base) | 808-422-0531 |
| Ask operator for Johnston Island: Telephone 441-3330 ext. 3636 | |

Authenticated:

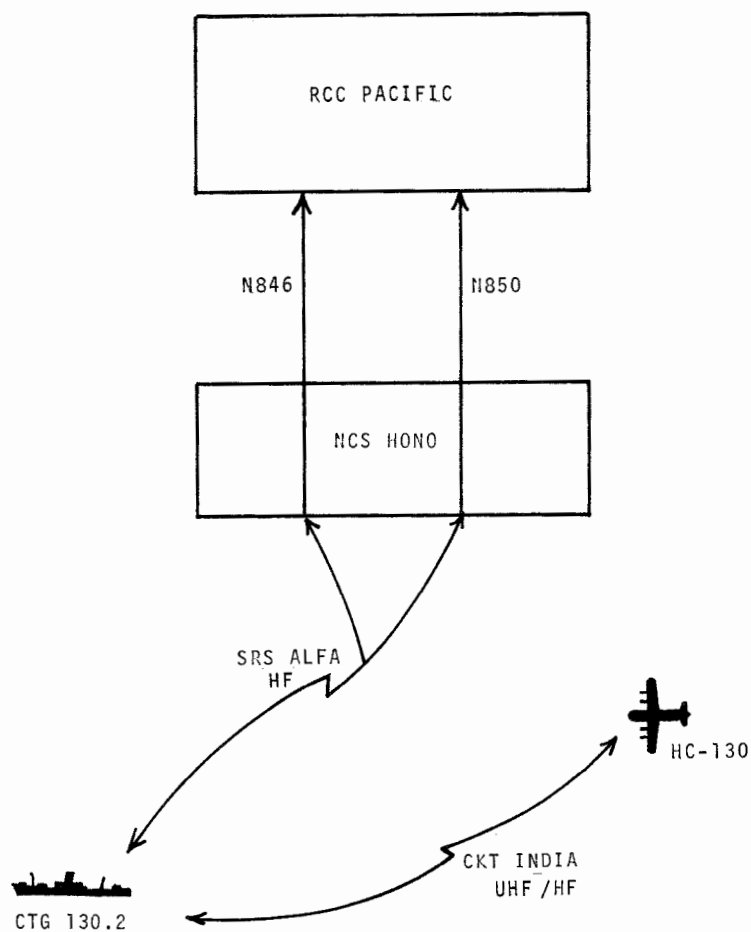

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Tabs:

- | | |
|---|--|
| A | - "SRS ALFA" and Circuit INDIA |
| B | - SRCC Common, Circuit HOTEL and Associated Circuits |
| C | - NASA Recovery Common (Fence Base Network) |

Tab A to Appendix III to Annex E
"SRS ALFA" and Circuit INDIA

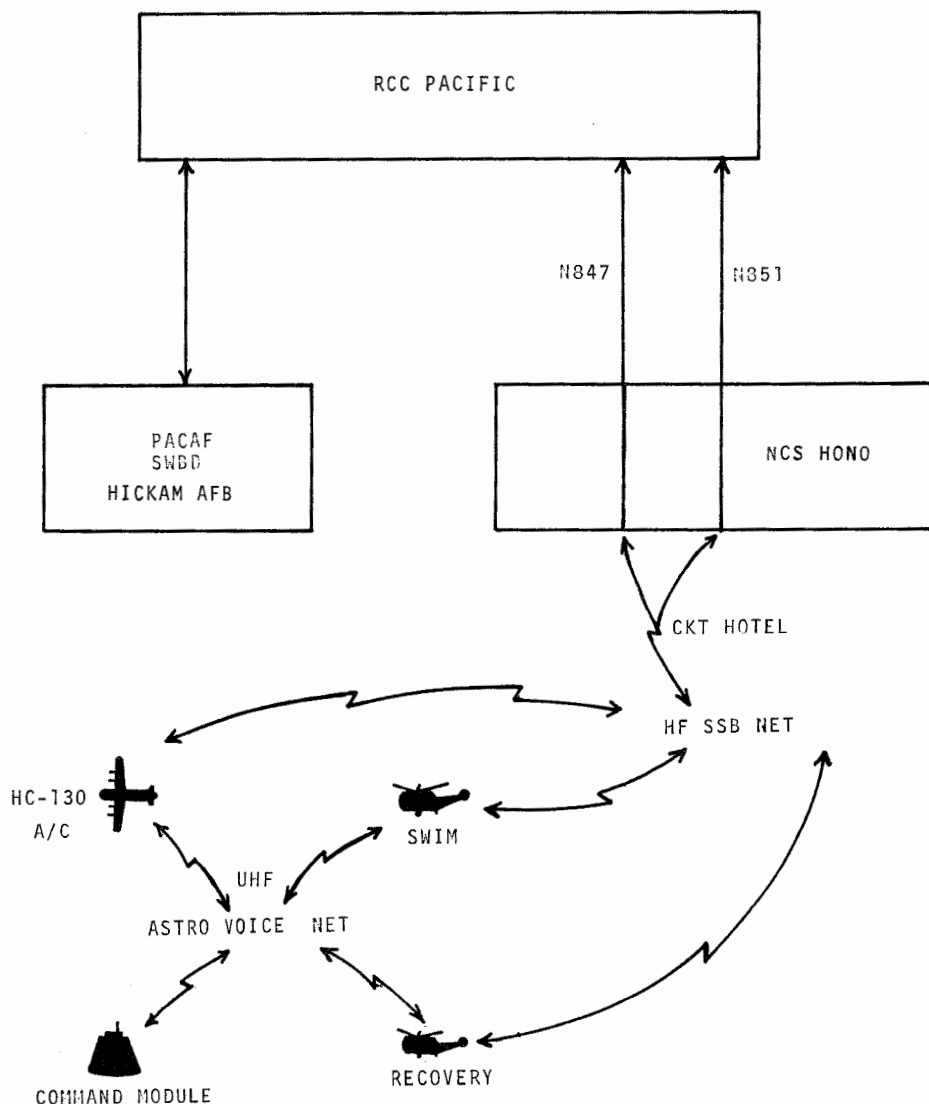


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Tab B to Appendix III to Annex E
SRCC Common Circuit HOTEL and Associated Circuits



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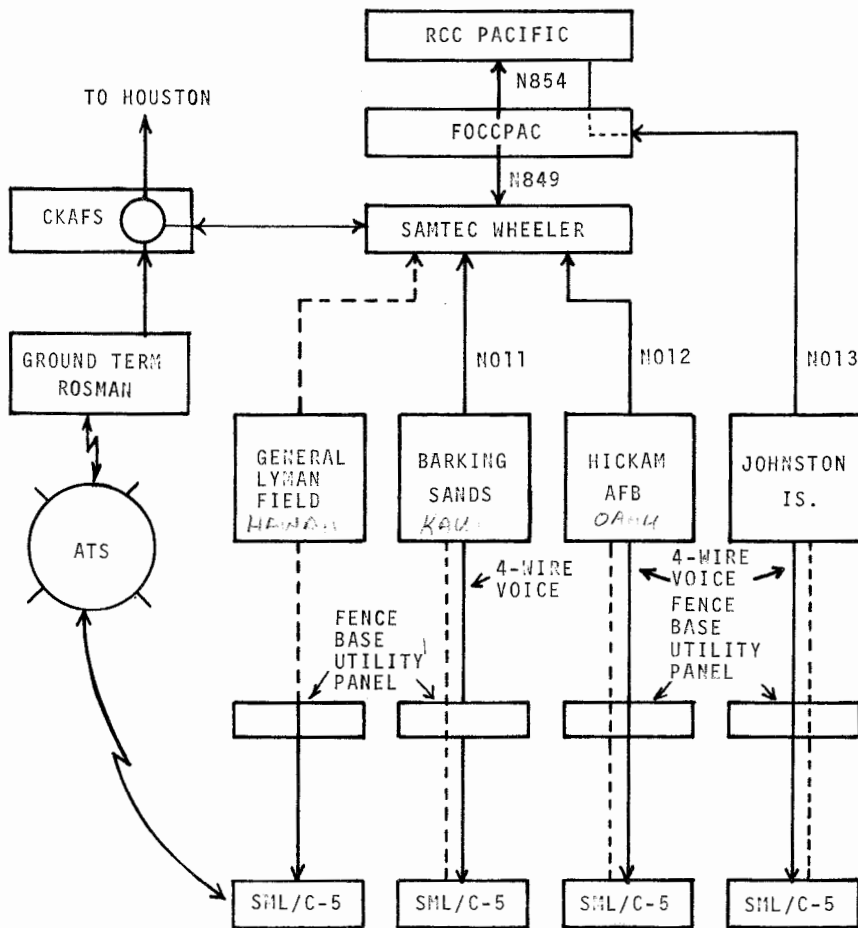
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Tab C to Appendix III to Annex E

NASA Recovery Common (Fence Base Network)



DASHED LINE INDICATES
COMMERCIAL TELEPHONE LINE

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Reference (a) COMHAWSEAFRON OPLAN 305-72

Appendix VIII 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 Skylab News Center at Houston. This requirement is addressed in Appendix I subparagraph 1.b.(2). The circuit will operate on a torn-tape relay basis at NAVCOMMSTA San Francisco with press traffic entered at that point into the press teletype network depicted in Tab A. The circuit will be activated upon departure of the PRS from San Diego for EOM and will be operational full-period until the ship returns to port following recovery operations. The circuit will be utilized for press pool copy only, using the format contained in paragraph 3 below. The CTF 130 PAO representative on board the PRS will accept only typed press pool copy from the pool writers, assign a consecutive PRS number to each release and submit to Radio for transmission. All press pool copy will be inspected at NAVCOMMSTA San Francisco to ensure readability prior to re-transmission. The embarked 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 as approved 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, interferes 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
- (5) Radio commentators position
- (6) Radio producer's position
- (7) Writers' position (1 location)

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

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

a. Press Pool Releases

FM: (Name of Ship)
TO: SKYLAB NEWS CENTER, MCC HOUSTON, TEX
SKYLAB NEWS CENTER, KENNEDY SPACE CENTER, FLA

BT

Operation Order
COMFOURTEEN No. 342-73

PRS NO 001 (To be numbered consecutively)

TEXT

BT

b. Press Number Continuity. At the end of each radio day, the PRS will send a radio comparison message in the format outlined below:

FM: (Name of Ship)

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

BT

UNCLAS

NUMBER COMPARISON - FOR RADIO DAY ENDING _____Z
(DTG) (Month,Year)

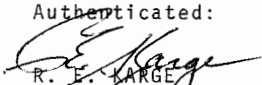
PRS SENT (number of messages sent during the period)

LAST PRESS NUMBER SENT (number)

BT

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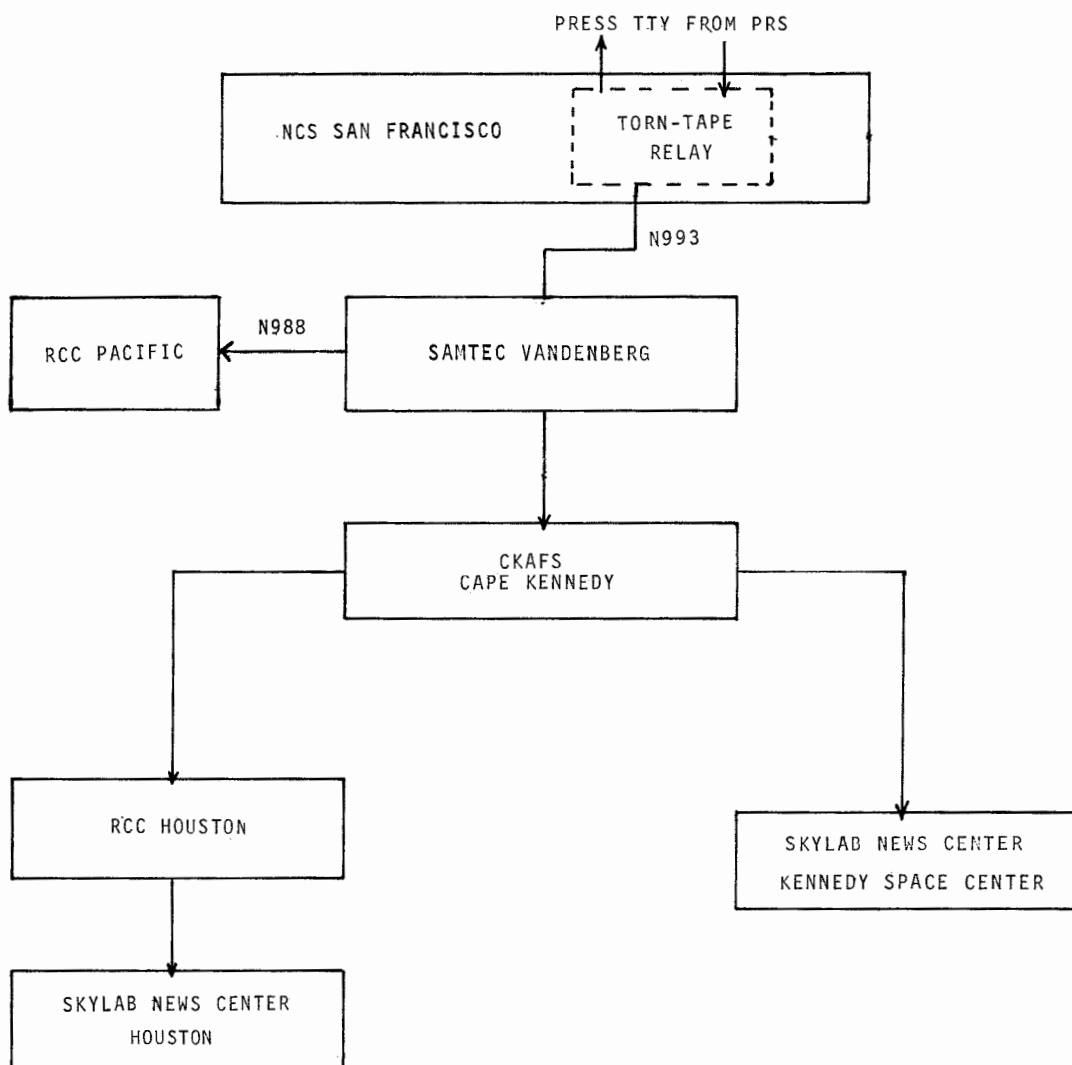

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Tab:

A - Press Teletype Circuits

Tab A to Appendix VIII to Annex E

Press Teletype Circuits



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Reference (a) COMHAWSEAFRON OPLAN 305-72

Appendix IV to Annex E

Recovery Communications Plan in Support of a Contingency Landing

1. General

- a. The contingency recovery plan is described in Annex D.
- b. A general recovery communications plan for a contingency landing is contained 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 areas. The CM could land anywhere along the groundtrack.

2. Forces

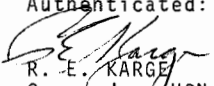
- a. In the event of a contingency landing, CTF 130 will utilize the nearest land-based air search unit or element and the closest ship capable of lending assistance. Additional military forces may be requested from the assets of regional SAR commanders or other commanders as appropriate.
- b. Assistance 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 frequencies and assets dedicated to support the primary and secondary landing areas will be available to support a contingency landing. Detailed circuit descriptions are contained in Appendices I, II and III and 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.
- d. CTF 130 maintains a portable HF contingency communications package for air drop in the event that a merchant ship-of-opportunity is required to recover the astronauts and/or command module. In addition to radio equipment, the package contains a portable gasoline powered generator.

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Appendix V to Annex E
Frequency Plan and Guard Assignments

FREQUENCY					PURPOSE						
CKT	(all kHz except as noted)					CTF 130	CTG 130.1	TG 130.1	CTG 130.2	CTG 130.4	TG 130.4
PRS ALFA and SRS ALFA	(a)	3089.5	(3088)	1	COMMAND/ CONTROL						
	(b)	4021.5	(4020)	1							
	** (c)	4556.5	(4555)	1	HF SSB Voice						
	(d)	4740.5	(4739)	3							
	** (e)	6691.5	(6690)	1							
	(f)	6694.5	(6693)	1							
	(g)	6698.5	(6697)	1							
	(h)	7363.5	(7362)	1							
	(i)	7454.5	(7453)	1							
	(j)	8977.5	(8976)	1							
	(k)	9121.5	(9120)	1							
	(l)	11196.5	(11195)	1							
	(m)	11215.5	(11214)	1							
	(n)	13238.5	(13237)	3							
	(o)	15062.5	(15061)	1							
	(p)	17986.5	(17985)	1							
	(q)	20491.5	(20490)	1							
	(r)	4458	1								
	(s)	4504	1								
	(t)	4705.5	2 (4704)								
	(u)	7827	1								
	(v)	7951	1								
	(w)	8022.5	2 (8021)								
	(x)	10152	1								
	(y)	10826	1								
	(z)	11005	1								
	(aa)	14603	1								
	(bb)	14829	1								
	(cc)	16042	1								
	(dd)	16297	1								
	(ee)	2248	1								
	(ff)	2470	1								
	(gg)	2656	1								
	(hh)	3265	1								
	(ii)	3277	1								
	(jj)	3319	1								
HOTEL (see note)	(a)	6745	(6743)	1	SRCC COMMON						
	** (b)	8981.5	(8980)	1							
	(c)	9040.5	(9039)	1	HF SSB Voice						
	(d)	11600	(11598)	2							
	** (e)	15088.5	(15087)	1							
	(f)	15548.5	(15547)	1							
	(g)	17986.5	(17985)	1							
	(h)	18408.5	(18407)	2							
	(i)	22738	(22736)	1							

CKT	FREQUENCY (all kHz except as noted)				PURPOSE			CTF 130	CTG 130.1	TG 130.1	CTG 130.2	CTG 130.4	TG 130.4
INDIA	(a)	142.5	MHz	1	Air to Ground Voice			G	X	W		W	
	(b)	149.4	MHz	1									
	** (c)	264.2	MHz	1									
	(d)	304.2	MHz	1									
	(e)	3102	(3100)	3									
	(f)	5072.5	(5071)	3									
ROMEO	(a)	11218.5	(11217)	3	UHF/HF Voice On-Scene Relay			G	X				
	(b)	15072.5	(15071)	1									
	(c)	22726.5	(22725)	1									

1. Legend:

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

2. Emission Authorization. The emission authorization for each frequency is indicated by the digit following the frequency in accordance with the following:

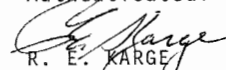
- 1 - 6A9B HAWAII and PACIFIC COAST
- 2 - 6A9B HAWAII only (Frequency usage not authorized from PACIFIC COAST)
- 3 - 3A3J ONLY HAWAII and PACIFIC COAST

NOTE 1: The frequencies appearing in parentheses indicate the window frequency when tuning 3A3J SSB emission.

2: Tuning 6A9B emission shall be in accordance with JANAP 195 (H), Section I, paragraph 121.3. (Note 9).

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Appendix VI 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 130.2	MIDPAC LEADER	
TG 130.2		MIDPAC 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 NEW ORLEANS (LPH 11) - "NEW ORLEANS".

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

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

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

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

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

- h. PRS Whaleboats --- "BOAT ONE", "BOAT TWO".

- i. Pararescue Swimmers --- "FAIRWAY ONE", "FAIRWAY TWO", etc.

- j. UDT Swimmers --- "UDT ONE", "UDT TWO", etc.

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	"NEW ORLEANS RADIO"
e. PRS Remote Station in the Medical Exam Spaces (SML)	"NEW ORLEANS MEDICAL"
f. PRS ATS Terminal	"NEW ORLEANS ATS"
g. NASA Personnel	"NEW ORLEANS RECOVERY"

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- h. NASA personnel at the C-5 parking area
at the respective fence bases

"HILO RECOVERY"

"HICKAM RECOVERY"

"JOHNSTON RECOVERY"

"KAUAI RECOVERY"

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

<u>Location</u>	<u>Voice Call</u>
a. NCS HONOLULU	"HAWAII RADIO"
NCS SAN DIEGO	"SAN DIEGO RADIO"
NCS SAN FRANCISCO	"SAN FRANCISCO RADIO"
SAMTEC VANDENBERG	"VANDENBERG CONTROL"
SAMTEC WHEELER	"WHEELER CONTROL"
BARKING SANDS, KAUAI	"BARKING SANDS CONTROL"
HICKAM AFB	"HICKAM CONTROL"
JOHNSTON IS.	"JOHNSTON CONTROL"

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

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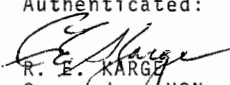

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Appendix VII to Annex E
Astronaut Communications Recording

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 48 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 equipment available. 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, and then only as dictated by established recovery procedures and necessity.

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COMNAV DIST

References: (a) COMHAWSEAFRON OPLAN 305-72
(b) DOD MGR for MSFS OPS and NASA MSC FCD Apollo Recovery Operational Procedures Manual, Revision E (10 October 72)

Annex G

Readiness and Training

1. General

a. Annex G to reference (a) sets forth overall guidance concerning training of units assigned to support Project Skylab. 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 and Air Force units assigned for this mission will receive training which will consist of the following as applicable:

- (1) Inport and underway recovery training
- (2) Weather observation and reporting training
- (3) Aircraft/swimmer recovery training

(4) Emergency medical treatment and flotation collar training for Navy, UDT and Air Force pararescue personnel by NASA. All training will be in accordance with references (a) and (b).

2. Equipment, Publications and Photographic Material

a. Required recovery equipment which is listed in Chapter 10, reference (b), will be issued to the recovery ship.

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 342-73
- (3) PACAF OPLAN C136
- (4) Reference (b)
- (5) Apollo Overall Medical Plan (ships only)
- (6) CINCPACFLT Operation Order 220-YR, Annex B (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 to reference (a))
- (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 the PRS and embarked units will be in accordance with Appendix I to this Annex.

5. Shipriders. It is planned that representatives from CTF 130 and NASA Flight Control Division will observe the exercises. Berthing requirements while embarked will be coordinated with the ship involved.

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6. Conduct of the Training

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

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 remote participating units. This training will be carried out in a manner that will duplicate the actual recovery as closely as possible to promote operational coordination and procedural optimization. A simulation will be conducted two days prior to the end of the mission (R-2), conditions allowing. Exercise times will coincide with those of the planned landing and be promulgated as soon as an actual landing time is determined.

8. The safety of personnel is paramount during all phases of the training. When 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 training 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 of this Annex.

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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.

TYPE I SIMEX

Boilerplate pickup. Position all aircraft in array for practice.
ELS deploy three 2-man UDT teams.
RECOVERY deploy 4-man UDT team for collar installation.
PRS retrieve CM using NASA winch for pickup. Debrief.

TYPE II SIMEX

Boilerplate pickup. Position all aircraft in array for practice.
ELS deploy three 2-man UDT teams.
RECOVERY deploy 4-man UDT team for collar installation.
SWIM deploy 3-man UDT team to act as astronauts.
RECOVERY make astronaut pickup with PHOTO flying in close as required.
Ship use NASA winch for CM pickup. Debrief.

TYPE III SIMEX

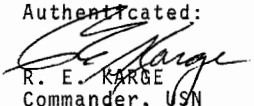
Boilerplate pickup. Position all aircraft in array for practice.
ELS deploy three 2-man UDT teams.
SWIM deploy 4-man UDT team for collar installation.
RECOVERY deploy 3-man UDT team to act as astronauts.
SWIM make astronaut pickup with PHOTO flying in close as required.
Ship use NASA winch for CM pickup. Debrief.

2. Circuits should be up and checked out with Pacific Chief one hour prior to the planned splash times. Embarked CTF 130 representatives will provide build-up information consisting of a Target Point Update, an Entry Sequence Report, and an Aircraft Position Update prior to each SIMEX. The requirement for all reports (Departure, Weather, etc.) begins with COMEX in accordance with Annex R. In the event of a communication failure with Pacific Chief, the SIMEXs will continue as scheduled with CTF 130 representatives aboard providing the inputs. The PRS and aircraft are required to be on station 20 minutes prior to the predicted splash-down.

3. See Annex A for SIMEX scheduling.

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Appendix II to Annex G
Training Communications Plan

1. PRS Communications Circuits. Underway training periods for USS NEW ORLEANS (LPH-11) afford the opportunity to conduct a "full-load" communications exercise between the NEW ORLEANS and CTF 130. Accordingly, the PRS training communications plan is divided into two categories; predeployment underway training communications for NEW ORLEANS, UDT 12 and HC 1; and communications test circuits for NEW ORLEANS and CTF 130.

a. Predeployment Underway Training Circuits. UHF/VHF voice circuits are required between NEW ORLEANS, HC 1 helicopters, UDT 12 swimmers and NEW ORLEANS' motor whaleboat. Frequencies for these circuits will be provided by NEW ORLEANS.

b. Communications Test Circuits for NEW ORLEANS and CTF 130

(1) Two voice circuits are required: CTF 130 Command and Control and NASA RECOVERY COMMON. These circuits will be brought up in the same manner as for the end-of-mission communications. Routing will be by HF through the appropriate NAVCOMMSTA, 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 the appropriate NAVCOMMSTA 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 Communications Coordinator	PACIFIC RADIO
PRS Commanding Officer	PRIMARY LEADER
USS NEW ORLEANS	NEW ORLEANS
NASA Personnel	NEW ORLEANS RECOVERY
PRS Communications Personnel	NEW ORLEANS RADIO
PRS Whaleboats	BOAT ONE, BOAT TWO
NAVCOMMSTA San Diego	SAN DIEGO RADIO
NAVCOMMSTA Honolulu	HAWAII RADIO
NAVCOMMSTA San Francisco	SAN FRANCISCO RADIO
PRS Aircraft	(IN ACCORDANCE WITH APPENDIX VI TO ANNEX E)

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 the CTF 130 RCC.

e. Additional Communications Requirements for SIMEXs. Astronaut Voice (296.8 MHz) will be set up and Circuit ROMEO checked out one hour prior to each SIMEX. Astronaut Voice will be set up with a position for embarked CTF 130 and NASA representatives to transmit and receive simulated astronaut voice traffic. CTF 130 at the RCC Pacific will be prepared to receive transmissions on Circuit ROMEO while the PRS is in the MIDPAC area.

2. SRS Training Communications Circuits

a. Ship/Shore HF SSB (3A3J) voice between the Duty Salvage Ship and CTF 130 (to be activated during underway periods only):

Primary	4740.5 kHz
Secondary	6691.5 kHz

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b. UHF voice between the Duty Salvage Ship, USAF aircraft, USAF pararescuemen and the Duty Salvage Ship motor whaleboats:

Primary	296.8 MHz
Secondary	259.7 MHz

c. Receive monitor on Circuit HOTEL with speaker located on the bridge.

d. Voice Call Signs

<u>Unit</u>	<u>Voice Call</u>
Duty Salvage Ship	(SHIP'S NAME)
Whaleboats	BOAT ONE, TWO, ETC.
Pararescue Swimmers	FAIRWAY ONE, TWO, ETC.
MC-130s	HAWAII RESCUE ONE, TWO, ETC.
HH-53Cs	RECOVERY, SWIM, ETC.
CTF 130 RCC	PACIFIC CHIEF
CTF 130 Communications Coordinator	PACIFIC RADIO
NCS Honolulu	HAWAII RADIO

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Operation Order
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COMNAVJIST

References: (a) COMHAWSEAFRON OPLAN 305-72
(b) Overall Medical Plan, Department of Defense Medical Support for Project Apollo Operations (Third Edition)

Annex H

Medical

1. General. References (a) and (b) provide detailed guidance necessary to perform the post-flight evaluations associated with Project Skylab.
2. Port Liaison Officers/Petty Officers. Medical Port Liaison Officers are designated by the Bureau of Medicine, Department of the Navy to support the DOD MGR's Assistant for Bioastronautics. 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 Project Skylab, the designated port liaison representatives are CDR H. E. DANIELS, MSC, USN, at the U. S. Naval Station Dispensary, Pearl Harbor, Hawaii and LCDR F. E. SMITH, MSC, USN, Chief of Operating Services, Naval Hospital, San Diego, California.
3. Shipboard Medical Personnel Requirements. The NASA medical team on the PRS will consist of flight surgeons, physicians, scientists and technicians. In addition to the NASA personnel, DOD medical personnel aboard the PRS will include surgeons, anesthesiologists, and surgical, X-ray and laboratory technicians totaling approximately 30 personnel.
4. SML (Skylab Mobile Laboratory). The SML is a portable self-contained medical facility consisting of six individual units and a utility package with shipping container. This facility will be maintained in a ready status at JSC, Houston. The decision for an early mission termination will be made in time to allow movement of the SML to a staging base near the predetermined landing area. ~~In a normal end of mission situation the SML, pre-loaded aboard a C-5A aircraft, will be flown to NAS North Island for either deployment to a "fence base" or loaded aboard the PRS. Should the mission continue to a planned completion in the primary landing area, the SML thus pre-positioned at NAS North Island, will be transported to the PRS prior to its departure from San Diego. This evolution is to ensure that the SML is in a position to be either transported to the SLA at the latest possible instant or loaded aboard the PRS for normal end of mission support. IMMEDIATELY PRIOR TO PRS ASSUMING TARGET POINT COVERAGE, THE SML WILL BE FLOWN TO HICKAM AFB AND UNLOADED ABOARD THE PRS.~~
5. Shipboard Medical Facilities Requirements. The post-flight medical examinations will normally be accomplished in the SML, however, the medical facilities of the PRS must be prepared to augment those of the SML if needed. A 100 ma portable X-ray machine will be required from the PRS during the examination process.

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~~COM 14 NAVDIST~~

Reference: (a) COMHAWSEAFRON OPLAN 305-72

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: RUWJAGE/FLENUMWEACEN MONTEREY

RUHHFSA/NWS PAC REG

RUWTDRA/NASA JSC HOUSTON MCC

INFO: RUHKBQH/RUHHLHH/CTF ONE THREE ZERO

RUHHAHA/FWC PEARL

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 and C format, are required from the PRS hourly, from six hours prior to CM landing until CM retrieval.

d. Consolidated weather reports may be made by the task group commander when operating within 10 nm of task units.

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

f. Aircraft weather reconnaissance responsibilities for the mid-Pacific zone and EOM will be assigned by the DOD Manager. The assigned activity/squadron will then coordinate with SMG (Spaceflight Meteorological Group), Honolulu, Hawaii and CTF 130 in determining type aircraft, staging base, briefing times and reporting procedures.

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Operation Order
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Reference: (b) DOD MGR for MSFS OPS and NASA MSC FCD Apollo Recovery Operational Procedures Manual, Revision E (10 October 1972)

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 130.2 will be authorized to check out of the movement report system for the period of deployment for recovery operations until OUTCHOP from CTF 130.
 - b. USAF units file movement reports in accordance with PACAF OPLAN C136 and PACAF's Project Skylab 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 the readiness of the assigned units 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 outlines 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 them to CTF 130.
 - b. Cost Factors Report. Individual PACFLT units supporting Project Skylab shall submit Cost Factors Reports in accordance with CINCPACFLTINST 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.

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Annex X

Distribution

Command	Copies	Command	Copies
AFETR (RSOAC)	4	FAIRECONRON ONE	1
AFETR (DOOP ATTN: RSOO)	5	FEDERAL COMMUNICATIONS COMMISSION	1
AIRPORT MGR GENERAL LYMAN FLD, HILO, HAWAII	1	FEDERAL COMMUNICATIONS COMMISSION PACIFIC REGION	1
CARAERON ONE ONE ONE	2	FIRST MOBILE COMMGRU	2
CCGD FOURTEEN	5	FLETACSUPPRON THREE ZERO	2
CG SAMTEC VAFB	2	FOCCPAC	2
CHIEF DCA PAC	3	FWC/JTWC GUAM	1
CHINFO	1	FWC NORVA	1
CINCPAC	3	FWC PEARL	2
CINCPAC (KUNIA)	1	HELSUPPRON 1	10
CINCPACAF	2	HQ ARRS SCOTT AFB	2
CINCPACFLT	8	HQ, 299TH INFANTRY	1
CNO	5	2ND BATTALION, HILO	1
COMASWGRU THREE	1	HQ USARPAC	1
COMBATCAMGRUPAC	1	HQ USARPAC (OFFICE OF THE CHIEF SURGEON)	1
COMBATCAMGRUPAC DET A	1	JCS	2
COMCRUDESAC	1	KWAJALEIN MISSILE RANGE	2
COMDESFLT FIVE	1	NAS AGANA, GUAM	1
COMFAIRALAMEDA	1	NAS BARBERS POINT	1
COMFAIRHAW COMNAVAIRPACREP BARBERS PT	1	NAS NORTH ISLAND	1
COMFAIRSDIEGO COMASWINGS PAC	1	NASA HQ WASH DC (CODE MORO)	2
COMFAIRWESTPAC	1	NASA JSC FC-7 HOUSTON TX	41
COMFE COMMREG, FUCHU	1	NAVAL WAR COLLEGE	1
COMHAWSEAFRON STAFF	30	NAVCOMMSTA GUAM	2
COMHAWSEAFRON STOCK	30	NAVCOMMSTA HONO	8
COMMAC	1	NAVCOMMSTA SAN DIEGO	5
COMNAVAIRPAC	4	NAVCOMMSTA SAN FRANCISCO	8
COMNAVCOMM	4	NCO PACIFIC HF/DF NET	2
COMNAVINS ~~PHIBRON EASTPAC~~	1	PACAF BASECOM, HICKAM	2
COMNAVMIANAS/CINCPACREPMARIANAS	2	PACCOMM AREA HICKAM	2
COMNAVSHIPYD PEARL	1	PACMISRANFAC HAW	3
COMNAVSPCWARGRU ONE ~~COMNAVINS/PHIBRON EASTPAC~~	1	SAMTEC VANDENBERG	2
COMPACMISRAH	3	SAMTEC HICKAM	2
COMPHIBPAC	1	SAMTEC WHEELER	2
COMPHIBOPSUPPAC	1	SKYLAB MISSION DIRECTOR, NASA KSC	2
COMSEA COMMREG, CLARK AB	1	SUPT USN PG SCHOOL MONTEREY	1
COMSERVPAC	1	UDT 11	5
CONSERVON FIVE CONSERVGRU FIVE	1	UDT 12	5
COMTHIRDFLT	1	USA HOSPITAL OKINAWA, RYUKYU	2
COMWESTAREA CG	4	USA TRIPLER ARMY MEDICAL CENTER	1
CTF 140/NAVY DEPUTY TO DDMS/ CNO REP MSFS OPS	3	USCINCSO	2
DCA	2	U. S. NAVAL HOSPITAL, SAN DIEGO	1
DCA OC	1	U. S. NAVAL STATION DISPENSARY, PEARL	2
DCS STA CLARK	1	USS GRAPPLE (ARS 7)	3
DCS STA FINEGAYAN	1	~~USS TICONDEROGA (CVS 14) NEW ORLEANS~~ 25	
DCS STA KWAJ	1	9TH WEARECONWG	1
DCS STA WAHIAWA	1	13TH AF JRCC	2
DDMS REP NASA HQ (CODE MOR)	1	15TH USAF DISPENSARY, HICKAM	1
~~DET ONE 41ST ARRWG, FUCHU AS~~	2	31ST ARRSQ (DOS)	2
~~DET THREE 15TH ABWG, JOHNSTON IS.~~	1	33RD ARRSQ (DOS)	2
DIRNAVSECGRU	1	39TH ARRWG (DO)	2
DOD MGR MSFS OPS	20	41ST ARRWG ~~(DO)~~ ~~WHEELER~~	4
FAA AREA MGR, GUAM	1	41ST ARRSQ HAMILTON AFB	1
FAA AREA MGR, SAMOA	1	57TH WEARECON SQDN	1
FAA AREA MGR, WAKE	1	76TH ARRSQ	2
FAA HONO ARTCC	1	326TH AIR DIV	2
FAA PACIFIC REGION (PC 500)	1	1957TH COMMGRU	1
FAA WESTERN REGION	1	1958TH COMSQ (AFCS)	1
		6594TH TEST GROUP	1

DET TWO 1136 SPECIAL ACTIVITIES SQD.

USS Bixster (ARS 33)

Authenticated: USS TAWAMENI (ATF 114)

R. E. KANGE USS GUAPAW (ATF 110)

Commander, USN
Manned Spacecraft Recovery Officer

COMNAVSEAFRON ONE

J. L. BUTTS RICHARD A PADDON
Rear Admiral, USN COM 14NAVDIST
Commander Hawaiian Sea Frontier and
Commander Manned Spacecraft Recovery Force,
Pacific (CTF 130)