

OPTICAL TECHNOLOGY DIVISION  
OPTO-MECHANICAL DESIGN ENGINEERING

Memorandum ME 53.

TO: Distribution  
DATE: September 1, 1971

FROM: L.B. Molaskey ✓

SUBJECT: Trip Report - Visit to San Diego Re: Recovery of RV #3

PURPOSE:

The purpose of this trip was to coordinate the fabrication of the underwater recovery hook with the Navy and to outline the tasks and responsibilities for the recovery operation.

ATTENDEES:

L. Molaskey - SSC  
[REDACTED] - HQS  
[REDACTED] - SPO

RESULTS:

The Navy has agreed to assume the responsibility for the fabrication of the hook using the SSC design. Completion of the hardware is scheduled for 14 September 1971. An in-air and at sea test program is planned starting 16 September and concluding about 1 October at the test site about 60 miles west of San Diego in the Pacific Ocean. The Trieste, after completing the test program, will be towed directly to the recovery site some 350 miles off of Hawaii.

The search vessel is scheduled to return from its last assignment, to Seattle, Washington before the end of this week. It will be outfitted there and will embark in about a week for the recovery site. It is scheduled to start the search on 1 October but is currently running about two days behind schedule.

The Trieste will rendezvous with the search vessel on about the 18th of October to commence the recovery operation. As scheduled, one dive can be made every three days. It is expected that the operation will be complete by 1 November.

DISCUSSION OF DETAILS:

The first meeting, after an introductory meeting with the commanding officer of Submarine Development Group One Captain [REDACTED] was held in [REDACTED]

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the group conference room with the following attendees:

Navy

Cdr. Brad Mooney - Chief Staff Officer CSDG-1  
L. Cdr. Ron Doyle - Sub Dev. Group One Staff  
L. Cdr. Rich Anderson - Sub Dev. Group One Staff  
Lt. Dick Taylor - Trieste Pilot

Others

L.B. Molaskey - SSC  
[REDACTED] - HQS  
[REDACTED] - SPO

[REDACTED] provided a briefing on the details of the recovery task describing the size, shape, weight, etc. of the payload and some of the background with regard to the effort performed to date.

L. Cdr. Anderson reviewed the Navy's effort to date and outlined the schedule requirements for deployment of the Trieste and search ship.

L.B. Molaskey presented a summary of the recovery techniques which have been considered to date resulting in the primary method embodied in the recovery hook design presented. The model of the prime recovery hardware was reviewed and demonstrated and it was agreed by all parties that the hook design and method of recovery proposed was probably the optimum approach.

The discussion which followed centered upon the means for fabricating and testing the hardware for the selected approach. In summary, the Navy agreed to assume responsibility for fabricating the required hardware in conformance with the SSC design. However, several minor design modifications were recommended. They are:

1. Rotate the cocking mechanism 90° with respect to the hook "open" direction so as to shorten the reach requirements for the manipulator.
2. Eliminate the main spring and provide counterweight mounting points for attaching lead weights which provide the same closing moment as the proposed spring.
3. Eliminate the bottom bar on the basket which presents a relatively long area for penetrating the mud on the ocean bottom. Replace this member with a bar, similar to the circumferential members, except that it is oriented in a

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plane parallel to the main hook arms.

4. Detail the latching mechanism (on a single drawing sheet) to provide the information necessary to fabricate the individual piece parts.

It was agreed that the above information would be forwarded to the Navy, by mail, before the beginning of next week (a phone call this morning 9-1-71 initiated the effort required to make the above drawing changes).

SPO reported that they had started fabrication of a special shipping container for return of the payload to the despooling facility. A telecon to Lt. Col. Hillock in request of the actual dimensions of the hardware, however, revealed that there was no design in process. HQS, therefore, requested that SSC take steps to procure the shipping container previously located by SSC. HQS was reminded of the restrictive message which authorized design activity only on the hardware involved. [REDACTED] agreed to instruct SSC, by message, to provide the container.

The detail steps to be performed by the recovery team were discussed. It was concluded that the most practical method of recovery was to use the hook as proposed by SSC. The dive will either be scheduled to bring the payload to the surface after dark or if need be, the Trieste will be maintained at a very deep (safe from a light exposure standpoint) level until after dark. Contrary to previous reports the payload will be suspended approximately 60 feet below the water surface during the transfer from the Trieste to the support ship. This constraint is due to the fact that the total cable length on the Trieste's winch is only 75 feet as compared to the earlier reported length of 120+ feet. The "after dark" recovery, however, eliminates the need to provide a light shroud and simplifies the hardware requirements considerably.

The matter of protecting the payload from fungus growth has not been solved by the addition of a fungicide because of the uncertainty of the possible long term damage potential of adding untested chemicals to the water. The result is either to maintain the payload, after recovery, at a temperature below 40°F or to limit the time at temperatures higher than 40° to a minimum. The approach selected as the most practical was a combination of both of the above. The Air Force is arranging to transfer the payload from the recovery vessel support ship to an Air Force operated ship from the recovery force. In this way, the payload can be returned to Hawaii in less than half the time required by the support ship. Upon reaching Hawaii the payload, in its shipping container, will be cooled by dry ice and insulation for the flight to Rochester. Logistics for these requirements are being handled by SPO.

This meeting concluded with an inspection tour of the Trieste. A series of photos was taken and will be available for review as soon as they are processed. The tour also included an inspection of the capsule simulator containing all the controls and instrumentation for systems on board.

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A second meeting was held in the afternoon at NUC (Naval Underwater Research and Development Center) to discuss the merits of the selected approach and to investigate the possibility of their shop fabricating the hardware. The attendees at this session were; in addition to SSC, HQS and SPO representatives:

Robert L. Watts - NUC Engineering  
Jim Held - NUC Engineering  
Art Schlosser - NUC Machine Shop

After discussing various alternate recovery approaches and equipment designs (all of which were quite complicated) the hook concept sketch was reviewed. It was again concluded that the design proposed was probably the best approach. The fabrication drawings were reviewed and the aforementioned changes discussed. Mr. Schlosser indicated that he could meet the schedule requirements if given sufficient priority and funds to apply the manpower required. A firm decision, however, could not be made until the commitment was reviewed by the proper authorities. It was agreed to have a firm commitment the following morning. At this writing there is still no word but it is probably 90% certain that that shop will do the job. Mr. Schlosser's phone number was made available so that the proposed changes could be coordinated directly.

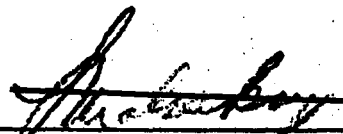
A back-up scheme was suggested as insurance in case there was a problem with the primary hook approach. After again discussing several approaches the one selected was the use of a net with a frame and plow teeth as illustrated in Figure 1. The Navy agreed to pursue the design and fabrication of this device as well as the primary hook.

A third meeting was arranged for the following morning to discuss the search operation with Dr. F. Speiss the search contractor. At this meeting the search technique was reviewed. The expected location was transmitted and the schedule discussed. Dr. Speiss reiterated his confidence that if the payload was in the area indicated that it could be located. He agreed that a HQS representative (probably Dale Ruth) would be of significant help on the search operation. It was tentatively agreed to proceed on that assumption and arrangements are to be made for Dale to meet the search vessel in Hawaii on about 1 October.

SCHEDULE SUMMARY:


The attached chart, Figure 2 shows the schedule for the overall recovery operation.

LBM/cj

  
L.B. Molaskey 9-2-71

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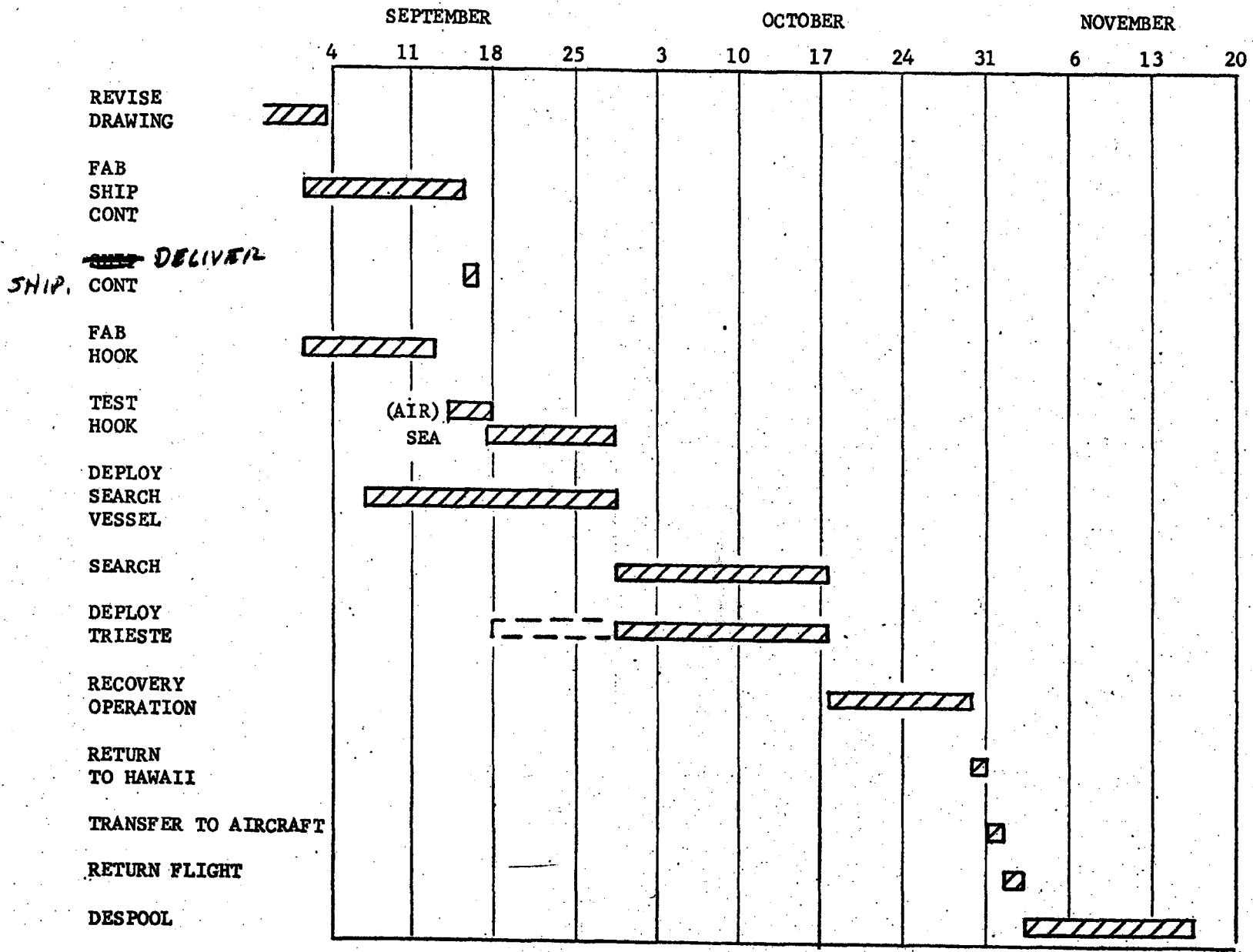


Figure 2

9-4-71  
LGM

BACK-UP RECOVERY  
TECHNIQUE

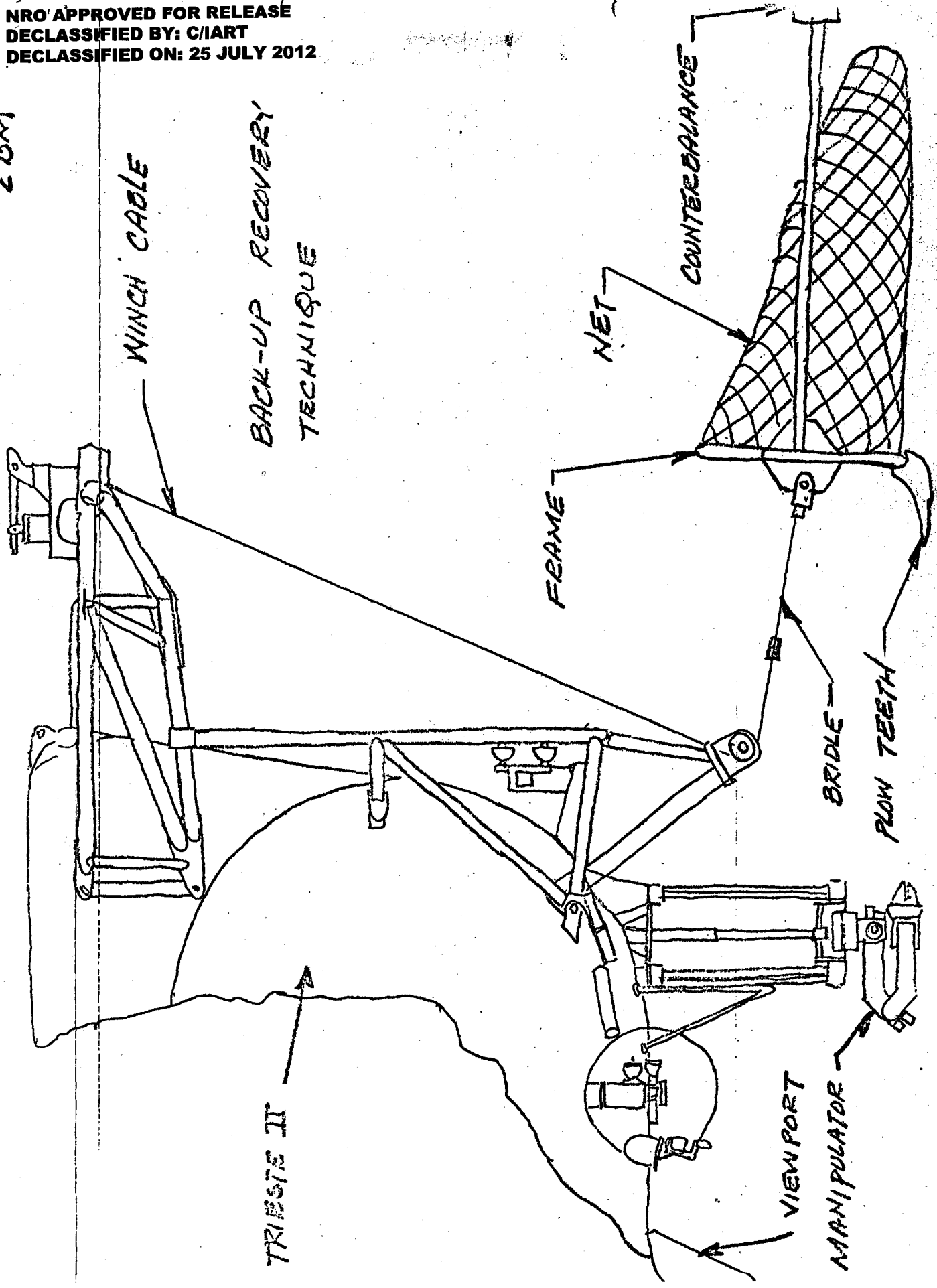


FIGURE 1