[redacted]

DEPARTMENT OF THE NAVY
USS DOLPHIN (AGSS 555)
FLEET POST OFFICE
SAN FRANCISCO, CALIFORNIA 96663-3400

DECLASSIFIED

5750
Ser AGSS555/55
23 FEB 1988

[redacted] - Unclassified upon removal of Enclosures (3) and (4)

From: Commanding Officer, USS DOLPHIN (AGSS 555)
To: Director of Naval History (OP-09BH), Washington, D.C. 20374-0571

Subj: COMMAND HISTORY OF USS DOLPHIN (AGSS 555) FOR CY87

Ref: (a) OPNAVINST 5750.12D

Encl: (1) Command Composition and Organization
(2) Chronology
(3) Narrative (U)
(4) Supporting Documents (U)

1. Per reference (a), enclosures (1) through (4) are forwarded for calendar year 1987.

D. W. SCHRECK

DECLASSIFIED BY: CNO (N09N2)
OPNAVINST 5513.16 SERIES
DATE: Nov 2005

Classified by: MULTIPLE SOURCES
Declassify on: OADR

DECLASSIFIED

[redacted]

## COMMAND COMPOSITION AND ORGANIZATION

1. USS DOLPHIN (AGSS 555) is a unique deep diving research submarine, designed to test advanced submarine structures and systems. She serves as a platform for underwater research at depths greater than previously possible with a vehicle of this type and size.

2. USS DOLPHIN's immediate superior in command is Commander, Submarine Development Group One, San Diego, California. DOLPHIN is presently commanded by Lieutenant Commander David W. Schreck, USN. He relieved Commander Robert H. Paleck on September 24th. Lieutenant Commander Schreck reported from Commander Submarine Development Group One where he was the New Developments Officer. Commander Paleck reported to Commander Submarine Development Group One as his Chief Staff Officer. USS DOLPHIN is homeported at San Diego, California, and is located at the Naval Ocean Systems Center (NOSC) there. For complete biographies of Commander Paleck and Lieutenant Commander Schreck, see the Change of Command Pamphlet in Enclosure (4).

CHRONOLOGY

1 JAN Continued Regular Overhaul, which commenced January 1985 in Mare Island Naval Shipyard, Vallejo, California.

14 APR Completed Regular Overhaul, commenced transit to homeport of San Diego, California.

24 APR Arrived at Naval Ocean Systems Center, San Diego, California.

29 JUN Completed installation of the Obstacle Avoidance Sonar System.

6 JUL Completed Shakedown Testing of the Obstacle Avoidance Sonar System and deployed a Volume Target Field off the Southeastern tip of Santa Catalina Island, CA.

2 AUG Completed installation of CLIPPER SHALE Program equipment.

8 AUG Completed CLIPPER SHALE Program, Phase One Testing.

26 AUG Completed installation of the AOS System.

2 SEP Completed Acoustic Optical System (AOS), Phase One Testing.

24 SEP LCDR D. W. Schreck, USN relieved CDR R. H. Paleck, USN of Command of USS DOLPHIN.

4 OCT Completed installation of Vorticity Meter System.

9 OCT Completed Vorticity Meter, Phase One Testing.

18 OCT Completed CLIPPER SHALE Program equipment reinstallation.

28 OCT Completed CLIPPER SHALE Program, Phase Two Testing.

12 NOV Completed reinstallation of AOS System.

24 NOV Completed AOS System, Phase Two Testing.

17 DEC Satisfactorily completed an Underway Material Inspection performed by the Board of Inspection and Survey, Pacific Fleet.

18 DEC Commenced removal of the BQR-2/BQS-4 Sonar System and installation of the AN/BQR-21 and integrated AN/BQS-4F EDM Sonar System.

NARRATIVE

1. Overhaul at Mare Island Naval Shipyard. (U)

(U) USS DOLPHIN conducted a Regular Overhaul and Integrated Logistics Overhaul at Mare Island Naval Shipyard from January 1985 to April 1987. Major accomplishments during this overhaul included thorough cleaning and refurbishment of the air systems, main propulsion cubicle restoration, replacement of topside superstructure, overhaul of steering and diving systems and Type 14 periscope. It was also discovered that many discrepancies existed in the ships plans, drawings, and support publications. An aggressive review was initiated to correct these deficiencies.

The overhaul, originally scheduled for nine months gradually extended to twenty-two months due primarily to delays in the factory (manufacturer) refurbishment of Parker-Hannifen air actuating valves and the Marrotta air reducers.

2. Obstacle Avoidance Sonar. (U)

(U) The Obstacle Avoidance Sonar (OAS) was developed specifically for USS DOLPHIN by the Applied Research Laboratory of the University of Texas. A similar sonar system is being developed for NR-1. The purpose of the Low Frequency portion of the OAS system is to give DOLPHIN a high frequency/high resolution sonar to aid in coming to periscope depth. The limitations of the AN/BQS-4 system made it inadequate for this purpose. The system is also under consideration as a replacement to the AN/BQS-14/15 sonar system as a Fast Attack Submarine under-ice sonar. A high frequency portion is to be installed in early 1988 for testing.

The Obstacle Avoidance Sonar performance exceeded expectations. The ship deployed a volume target field in the shoal water off the southeastern tip of Santa Catalina Island consisting of four 8 to 10 inch diameter calibrated targets and three deep ocean transponders (DOT's). The OAS system consistently detected all targets and was able to accurately map the field by interrogating the DOT's. For more information, see Operations Summary in Enclosure (4).

3. CLIPPER SHALE Program. (U)

(C) USS DOLPHIN performed Phase I and II testing of the CLIPPER SHALE Program during 1987 and Phase III testing is scheduled for early 1988. The purpose of the CLIPPER SHALE system is to perform Non-Acoustic Anti-Submarine Warfare. The results of Phase I and II testing indicated great promise for this system. For more information see Clipper Shale Phase I and II Operations Summaries in Enclosure (4).

4. Acoustic Optical System. (U)

(C) The Acoustic Optical System (AOS) consists of a remotely operated vehicle (ROV) and the associated housing and tether system. The two testing period objectives were to prove the feasibility of operating an ROV from a submerged platform. The DOLPHIN proved the ability to make coordinated maneuvers with the ROV, maintaining position relative to the ship during turns and speed changes. DOLPHIN also validated operating and casualty procedures for this system. Further testing is scheduled for early 1988. For more information, see the Operations Summaries in Enclosure (4).

Classified by: MULTIPLE SOURCES
Declassify on: OADR

NARRATIVE (Cont.)

5. Vorticity Meter System. (U)

(C) The Vorticity Meter System is another form of Non-Acoustic Anti-Submarine Warfare. Testing gave excellent results and this system shows great promise. Problems were experienced when electrical noise degraded system sensitivity. This was solved by improving electrical isolation between sensors and the tripod mounted on DOLPHIN's bow. For more information see the Operations Summary in Enclosure (4).

6. Change of Command. (U)

(U) On 24 September Commander Robert H. Paleck was relieved by Lieutenant Commander David W. Schreck in ceremonies at Pier Alpha, Naval Ocean Systems Center, San Diego, California. The speaker was Captain Michael C. Tiernan, Commander, Submarine Development Group One. Captain Tiernan awarded Commander Paleck the Meritorious Service Medal for outstanding performance in his tour on board USS DOLPHIN. Rear Admiral Hill, Commander, Submarine Group Five, was amoung the distinguished guests attending the ceremony.

7. Underway Material Inspection. (U)

(C) The ship satisfactorily completed an Underway Material Inspection (UMI), conducted 14-17 December and was certified for continued operations. Major deficiencies were: (1) Number 1 and 2 Diesel Generator reverse current trips failed to operate properly (corrected), (2) Rudder ram coupling nut was not properly torqued, (3) Number 1 Diesel Generator under/over speed mechanism failed, rendering the generator inoperative (corrected), (4) the cable run to the stern light is flooded making the light inoperative, (5) the AN/BRA-17 antenna cannot be used throughout the full frequency range, (6) the AN/PRC-96 emergency tranceiver was inoperative.

8. AN/BQR-21. (U)

(U) Installation of the AN/BQR-21 and integrated AN/BQS-4F EDM Sonar System began on 18 December and will finish in January 1988. The objective of this improvement is to upgrade DOLPHIN's sonar capabilities to a more state of the art digital system over the analog AN/BQR-2/BQS-4 system it will replace.

CONFIDENTIAL - UNCLASSIFIED upon removal of items 5 and 10.

SUPPORTING DOCUMENTS

1. Pamphlet "The USS DOLPHIN...a Research Submarine"
2. USS DOLPHIN Welcome Aboard Pamphlet
3. Obstacle Avoidance Sonar (OAS) Underway Testing Summary
4. CLIPPER SHALE, Phase One, Operations Summary
5. Operations Summary of AOS Sea Trials (U)
6. Change of Command Pamphlet
7. Vorticity Meter, Phase One, Operations Summary
8. CLIPPER SHALE, Phase Two, Operations Summary
9. AOS (Phase Two) Operations Summary
10. Underway Material Inspection Report (U)



Classified by: MULTIPLE SOURCES
Declassify on: OADR

Enclosure (4)

ENG

[redacted]
[redacted] NAVY
[redacted]
FLEET POST OFFICE
SAN FRANCISCO, CALIFORNIA 96663-3400

DECLASSIFIED

DECLASSIFIED

3300
Ser AGSS555/203
15 SEP 1987

[redacted] - Unclassified upon removal of Enclosures (1), (2) and (3)

From: Commanding Officer, USS DOLPHIN (AGSS 555)
To: Commander, Submarine Development Group 1

Subj: OPERATIONS SUMMARY OF AOS SEA TRIALS (U)

Ref: (a) CTG FOURTEEN PT SIX 200143Z AUG 87 (CTG 14.6 LOI 120-87)

Encl: (1) AOS Sea Trials Sequence of Events (U)
(2) Chronological Listing/Bibliography of USS DOLPHIN (AGSS 555)/AOS Program Correspondence and Message Traffic (U)
(3) AOS Sea Trials Lessons Learned (U)
(4) AOS Sea Trials Quicklook

1. This letter submits the USS DOLPHIN (AGSS 555) summary of operations conducted in support of AOS sea trials as directed by reference (a). Where possible, non-essential specifics are absent and references are referred to in order to reduce the volume of material enclosed and the level of classification of this report.

2. The dates and corresponding events of DOLPHIN's dedicated involvement with the AOS sea trials are provided in enclosure (1). In addition to that specific period, advantage was taken of opportunities available during previous inport maintenence and upkeep periods, subsequent to the ship's return to San Diego in April 1987, to conduct prerequisite location and foundation work. Administrative and operational correspondence and message traffic pertaining to DOLPHIN's involvement with the AOS program to date are provided by enclosure (2). Lessons learned regarding topics and areas where planning, action or performance can and should be improved in future DOLPHIN/AOS operations are provided in enclosure (3). Enclosure (4) is a quicklook summary analysis of data gathered from the AOS sea trials.

3. DOLPHIN's involvement in the AOS Program will continue during at least the first quarter of FY88. It should be noted that the system operated satisfactorily with the exception of the power generation equipment which was unreliable. While not all information was gathered during these sea trials as was hoped for, the trials proved the operability of the system though not the reliability. In spite of the power reliability problems, the bottom line is that the AOS concept was demonstrated to be quite sound and very achievable.

R. H. PALECK

Copy to:
[redacted] 5

DECLASSIFIED BY: CNO (N09N2)
OPNAVINST 5513.16 SERIES
DATE: Nov 2005

[redacted]

[redacted]

26 August

1700 Ship underway from NOSC Pier Alpha, transiting to initial dive site.

27 August

0330 Rendezvoused with TRB-10 and established communications via underwater comms. TRB-10 instructed to maintain station until DOLPHIN surfaced.

0420 Submerged the ship to conduct initial AOS testing. Initial dive conducted in areas 3811XX/3812XX. Time scheduled in areas 3702XX/3703XX was insufficient to support full dive period due to delayed underway.

0905 Surfaced the ship. Rendezvoused with TRB-10 again. Commenced troubleshooting electrical noise problem experienced in the AOS system.

1015 Successfully cleared the EMI problem with the AOS system by changing operating panel power from 400 HZ to 60HZ.

1105 Submitted SITREP 001.

2327 Submerged the ship to continue testing. TRB-10 maintaining station until DOLPHIN surfaces.

28 August

0539 AOS 400 HZ motor generator overheated. Launcher camera not trainable. AOS testing secured.

0626 Surfaced the ship. Rendezvoused with and then released TRB-10 to allow her to refuel. Commenced transit to SCI to effect personnel transfer to arrange for repairs of the motor generator.

0930 Conducted personnel transfer in Wilson Cove, SCI and commenced transit to San Diego to repair the motor generator.

1041 Submitted SITREP 002.

29 August

0700 Moored NOSC Pier Alpha.

0915 400 HZ motor generator removed from ship for repair at contractor facility. Investigating camera problem.

CLASSIFIED BY: DD-254 dtd 86 AUG 04 for Contract N00014-87-C-0127
DECLASSIFY ON: OADR

DECLASSIFIED

30 August

0800 400 HZ motor generator reinstalled onboard. Commencing system testing.

1200 No output voltage observed on 400 HZ motor generator. Local contractor called in to assist troubleshooting.

1700 Output voltage restored and was probably due to a loss of residual magnetism in the motor generator's field. Ship underway from NOSC, pier ALPHA, transiting to dive site.

31 August

0834 Submitted SITREP 003. While surfaced, system startup checks of the AOS system, 400 HZ motor generator output consistently dropped to zero when fully loaded. Commenced transit to Wilson Cove, SCI to await repair parts and technical assistance.

0800 Moored at Wilson Cove, buoy WC#3.

0830 Transferred AOS test director and two assistants ashore to discuss technical problems in San Diego.

1900 AOS personnel returned to boat with Arnhart Electric Co. technician.

2326 Submitted SITREP 004 reporting 400 HZ motor generator problems corrected and system fully tested.

1 September

0630 Transferred Arnhart technician ashore. Underway from Wilson Cove, transiting to dive site.

0816 Submerged the ship.

0930 Commenced AOS operations. All systems functioning normally.

1030 400 HZ motor generator motor breaker tripped due to an apparent overload. Commenced emergency recovery procedures. OAS display revealed that a second and third object (possibly large fish, sharks or mammals) appeared in same area as the ROV and may have physically interacted with the ROV causing it to power up all thrusters at once to reorient itself and causing entanglement of the vehicle in it's tether.

1105 Restarted SSMG after cooling down the 400 HZ MG and checking for satisfactory resistance to ground and continuity of all tether functions, and powered up the vehicle. Vehicle secured using the swim-in emergency recovery mode. AOS housing door shut approximately two-thirds due to partial ROV blockage of the door.

1147 Surfaced the ship. Securely stowed AOS in it's housing.

1609 Submitted SITREP 005. Transiting to Wilson Cove to transfer AOS and UMV detachment personnel.

1700 Transferred personnel ashore. Commencing transit to San Diego to effect repairs to 400 HZ motor generator. Postponing further AOS sea trials until reliability of system proven by exhaustive load testing.

2 September

0830 Moored NOSC pier ALPHA.

1930 After conducting various over-the-side tests at full load, motor generator continued to have problems. Due to rework required on the motor generator and proximity to the end of the sea trials period, further at sea testing was aborted until next scheduled AOS test period (Nov 87).

9 September

1600 Removal of AOS system complete.

[redacted]

CHRONOLOGICAL LISTING [redacted] OF USS DOLPHIN/AOS PROGRAM
CORRESPO[redacted] TRAFFIC (U)

| REFERENCE | SUBJECT | CONTENTS |
|---|---|---|
| Honeywell ltr dtd 12 Aug 87 | AOS Test Plan-Final | (U) Overall test plan including operating and emergency procedures. |
| CTG 14.6 [illegible] AUG 87 | CTG 14.6 LOI 120-87 | (U) Letter of Instruction for AOS Sea Trials. |
| USS DOLPHIN 271808Z AUG 87 | SITREP 001 | (C) Reports problems with launcher and SIT cameras after first dive. |
| USS DOLPHIN 281741Z AUG 87 | SITREP 002 | (C) Reports problem with 400 HZ SSMG and 400 HZ noise on telemetry cable after second dive. RTP ETA. |
| USS DOLPHIN 311034Z AUG 87 | SITREP 003 | (U) Reports problem with 400 HZ SSMG prior to first dive. ETA Wilson Cove. |
| USS DOLPHIN 010526Z SEP 87 | SITREP 004 | (U) Reports correction of problem with 400 HZ SSMG. Intentions to continue test plan. |
| USS DOLPHIN 012309Z SEP 87 | SITREP 005 | (U) Reports 400 HZ SSMG failure and abortion of sea trials. RTP ETA. |

CLASSIFIED BY: DD-254 dtd 86 AUG 04 for Contract N00014-87-C-0[illegible]27
DECLASSIFY ON: OADR



Encl (2)

[redacted]

AOS Program. S[redacted] Lessons Learned (U)

1. (U)Lesson Learned: Total Integrated System Testing Required.

Description: The 400 HZ SSMG was never actually used in pre-installation testing and this proved to be the most limiting piece of equipment during the sea trial period. Had the unit been used with the system during pre-installation testing, the overload problems might have been identified and corrected prior to shipboard installation. Following the replacement of the 400hz SSMG after its initial at sea failure, only a partial, light load test dockside was conducted. During the subsequent transit to the dive site, the 400 HZ SSMG failed again when a full load was placed on the machine. Again, thorough system testing was not completed which resulted in significant delays in the at sea testing.

Recommendation: For future projects, twelve hours of entire integrated system checkouts over the entire anticipated range of operations should be conducted dockside. This would eliminate to a large extent the last minute discovery of problems that could have been corrected earlier. Thorough testing should also be done following any replacement or repair of significant equipment.

2. (U)Lesson Learned: Better preparation required by installing activities prior to shipboard installation.

Description: This project served as yet another example of last minute preparations which forced a compression of the installation and pre-underway testing schedules. Approval for project installation (three separate temporary modifications) was delayed due to the late and incomplete submission of technical data by NOSC to NAVSEA. Dockside testing was delayed further by the tardy installation of the AC shore power breaker caused by lack of the correct parts for the breaker modification and last minute design changes. A lack of sufficient manpower forced the installing activity, NOSC, to work many aspects of the installation in series vice parallel paths.

Recommendation: The installing activities must anticipate all technical information required by the temporary modifications approving authorities and submit it well in advance of projected installation date to allow adequate time for technical review and administrative processing of approval. Material required must be identified as early as possible and installation shipchecks must be thorough enough to prevent late design changes which result in alterations to installation materials. Lastly, as demonstrated by this and the last major project installation (CLIPPER SHALE), NOSC requires knowledgeable technician augmentation in order to meet the demanding and constrained installation schedules.

CLASSIFIED BY: DD-254 dtd 26 AUG 84 for
Contract N00014-87-C-0127
DECLASSIFY ON: OADR

DECLASSIFIED

Encl (3)

[redacted]

3. (C)Lesson Learned: Prior ship[redacted]id off during casualty.

Description: In anticipation of AOS operations, the ship practiced unique ship training control and handling that would be required during the at sea testing. This included hovering and backing the boat submerged. This paid off well during the loss of 400 HZ power that occurred with the ROV deployed. Recovery was completed expeditiously and without incident.

Recommendation: Any at sea testing which requires unique ship handling and control should be practiced well ahead of time to allow crew proficiency to be developed. Scheduling should continue to allow for type training at sea prior to the planned testing, and the project's requirements for special ship control identified as early as possible.

4. (C)Lesson Learned: The University of Texas, Applied Research Lab, Obstacle Avoidance Sonar (OAS) system is an invaluable tool for use with the AOS system.

Description: During the submerged testing of the AOS system, the only consistently reliable, accurate means of locating the ROV was with the OAS sonar. With a dedicated OAS operator the AOS operator could effectively drive the vehicle to any point using the information provided by the OAS sonar.

Recommendation: Continue developing the coordination of AOS/OAS operation through the future of this program, and anticipate its future requirement associated with any further vehicle operation programs/systems from DOLPHIN.

AOS S[redacted]

RESULTS SUMMARY

COMPLETED OBJECTIVES

- OPERATING PROCEDURE VERIFICATION
  - PREPARATION / SYSTEM STARTUP
  - LAUNCH / DEPLOYMENT
  - MANEUVERING
  - RECOVERY / SYSTEM SHUTDOWN
- SHIP'S SONAR TRACKING OF AOS
- SHIP HANDLING TEAM / AOS OPERATOR COORDINATION
  - AOS STATION KEEPING RELATIVE TO SHIP (DEAD SLOW, 1.7 KT CONTINUOUS AND 0 TO 1.5 KT INTERMITTENT TURNS)
  - COORDINATED TURNS (1 KT AT 150 YD RANGE)
- INITIAL OPERATING ENVELOPE EXPLORATION (0 TO 1.5 KT AT 300 YD RANGE)
- EMERGENCY PROCEDURE APPLICATION
  - "DEAD" AOS RECOVERY (INCLUDING BACKING DOWN WITH STERNWAY)
- SAR EQUIPMENT OPERATION VERIFIED (DOCKSIDE TESTS)
  - RF BEACON / RADIO DIRECTION FINDER
  - ACOUSTIC PINGER / BEARING TRACKER

AOS SHAKEDOWN SEA TEST

RESULTS SUMMARY

REMAINING OBJECTIVES

DECLASSIFIED

- LONG RANGE OPERATIONS (310 TO 400 YD)
- COMPLETE OPERATING ENVELOPE EXPLORATION (1 TO 3 KT, RANGE TO 400 YD)
- [illegible] DEMONSTRATION BY AOS
- EVALUATION OF SHIP'S SONAR TRACKING OF AOS TRANSPONDER (COMMANDS / INTERROGATION / COLLECTED)
- EVALUATION OF HPU NOISE EFFECT ON SHIP'S SONAR RANGE

Encl (1)

CONFIDENTIAL

# AOS SHAKEDOWN SEA TEST RESULTS SUMMARY

## CONCLUSIONS DRAWN

- AOS OPERATIONAL CONCEPT IS VIABLE
  - SYSTEM OPERATING CHARACTERISTICS EXCEED EXPECTATIONS
  - SYSTEM / SHIP'S CONTROL AND SONAR OPERATIONS INTEGRATED WELL
  - COMBINATION OF TWO PRIMARY EMERGENCY RECOVERY PROCEDURES DEMONSTRATED UNDER REAL CONDITIONS
- SHIP'S SONAR OPERATOR SKILL AND INTEGRATION IN THE AOS OPERATION ARE CRUCIAL
- AOS OPERATOR SKILL AND EXPERIENCE LEVELS AND SHIPBOARD TRAINING ARE ALSO CRUCIAL
- EXISTING WRITTEN PROCEDURES ARE ADEQUATE FOR ROUTINE & EMERGENCY OPERATIONS
- SHIP'S MANEUVERABILITY AND RESPONSE ENHANCE AOS EMERGENCY OPERATIONS
- EXISTING AOS SHIPBOARD SYSTEM AND SHIP'S SUPPORT SYSTEMS WILL BE APPROPRIATE TO SUPPORT CONTINUED AOS OPERATIONS AND DEMONSTRATION SEA TEST AFTER CORRECTION OF 400 HZ MOTOR GENERATOR PROBLEM AND MISCELLANEOUS MINOR IMPROVEMENTS TO AOS HARDWARE.

[redacted]

AOS SHAKEDOWN SEA TEST
RESULTS SUMMARY

AOS SUBSYSTEM

| PROBLEM AREA | IMPROVEMENTS FOR DEMO |
|---|---|
| AOS OPERATION WITH CONSTANT LONG. THRUST | ADD "CRUISE CONTROL" (POT CALIBRATED IN % THRUST WITH CUTOUT SWITCH TO RETURN CONTROL TO JOY STICK) |
| OPERATIONAL INTEGRATION WITH SHIP'S SONAR OPERATOR | ADD SHIP'S SONAR TO AOS COMMUNICATION (MAY ONLY REQUIRE MONITORING NORMAL SONAR / CONTROL COMM LINE |
| CABLE TERMINATION | RETERMINATE BOTH ENDS OF BOTH SYSTEM AND SPARE CABLE USING IMPROVED DESIGN AND PROCEDURE |
| POTENTIAL CABLE SNAGS | ADD GUARDS TO FAIR POSSIBLE SNAG POINTS ON DEPLOYMENT UNIT AND ON AOS ITSELF |
| BENT ALUMINUM SKIDS/ BUMPERS, BROKEN ISOLATORS (AOS PUSHED IN BY DOCK) | STRAIGHTEN SKIDS AND REPLACE RUBBER ISOLATORS (CONSIDER FUTURE REPLACEMENT WITH STRONGER STAINLESS STEEL SKIDS) |





Encl (4)

[redacted]

ACS [redacted] TEST
RESULTS SUMMARY

VIEWING SUBSYSTEM

| PROBLEM AREA | IMPROVEMENTS FOR DEMO |
|---|---|
| TV CAMERA COVERAGE NEEDED | |
| o OVERALL SCENE AND PHOTO DOCUMENTATION | o INSTALL OSPREY TV/PHOTO CAMERA ON SHIP (NOSC) |
| o LAUNCH/RECOVERY VISIBILITY | o ADD FLASHER (UMV) TO STBD OF ACS, POINTING AFT (CONSIDER FUTURE REPLACEMENT OF BOTH LAUNCHER AND ACS BUBBLE CAMERA ELECTRONICS WITH NEW TYPE ICCD LLLTV) |
| o CABLE MONITORING | o REPOSITION WINCH TV CAMERA FOR BETTER VIEW INTO LAUNCHER; ADD SWITCH TO SELECT WINCH TV AT VCU |
| UMATIC VCR RECORD OPERATION AND RELIABILTY | THOROUGH TEST PRIOR TO REINSTALLATION ON SHIP (NEED AT HP FROM LENDERS MID OCTOBER: SIX VCRS) o SINGLE REMOTE CONTROL? o HIGHER QUALITY TAPES o SHIPBOARD SETUP FOR EDITING BETWEEN ACS DEPLOYMENTS |



[redacted]

AOS SHAKEDOWN SEA TEST
RESULTS SUMMARY

ACOUSTIC SUBSYSTEM

| PROBLEM AREA | IMPROVEMENTS FOR DEMO |
|---|---|
| TRANSPONDER INTERROGATION MASKING BY AOS NOISE | CHANGE TO RESPONDER<br>o ADD RESPONDER FUNCTION TO EXISTING TRANSPONDER<br>o PROVIDE TRIGGER SIGNAL TRANSMISSION THROUGH AOS SYSTEM<br>o ADD INTERROGATE TRIGGER PULSE DELAY (= RANGE) TO TO SHIP'S SONAR |

NOTE: THIS APPROACH HAS MINIMUM IMPACT (TECHNICAL, SCHEDULE AND COST) AND PRESERVES THE EXISTING TRANSPONDER CAPABILITY FOR USE IN TRACKING A "DEAD" AOS (DRIFTING FREE) WITH THE SHIP'S SONAR FOR SAR PURPOSES.

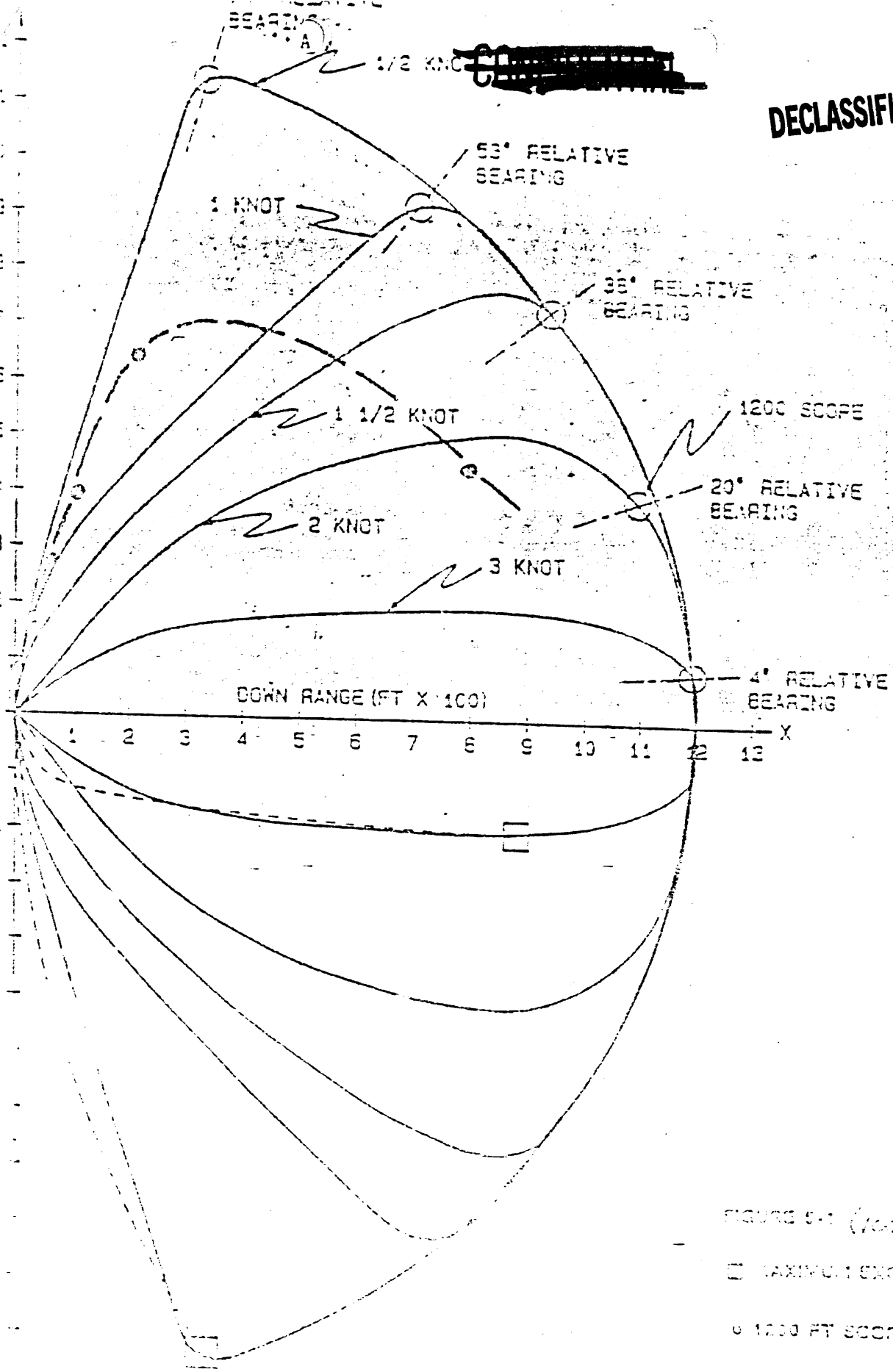


FIGURE 5-1 (100% THRUST)

□ MAXIMUM EXCURSION

⊙ 1200 FT SCOPE LIMIT

-- TAUT CABLE CATENARY



Encl (4)