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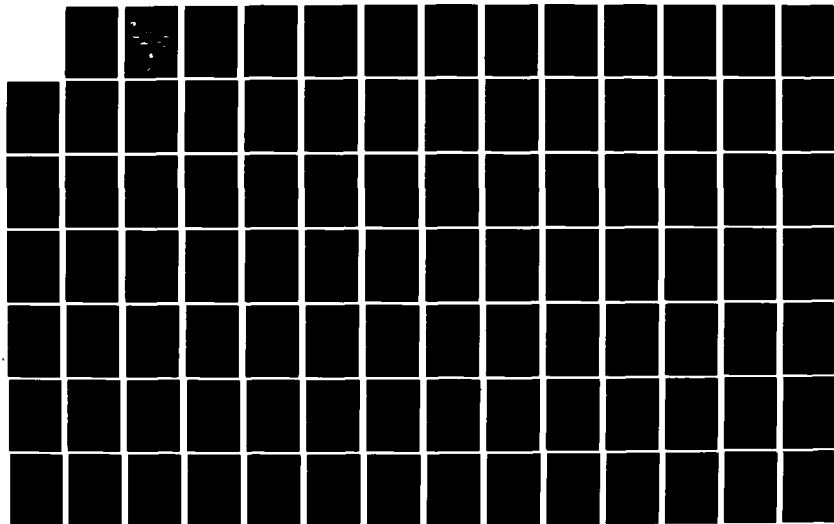
SHARPS III UPDATE REVIEW--AUTUMN 1982(U) NAVAL OCEAN  
RESEARCH AND DEVELOPMENT ACTIVITY NSTL STATION MS  
R M HOLT 14 SEP 82 NORDA-TN-169

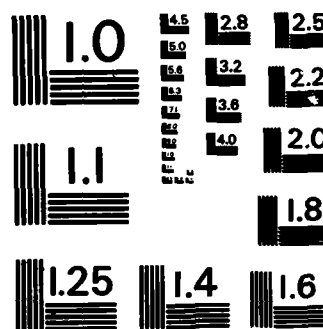
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Naval Ocean Research  
and Development Activity  
NSTL Station, Mississippi 39529

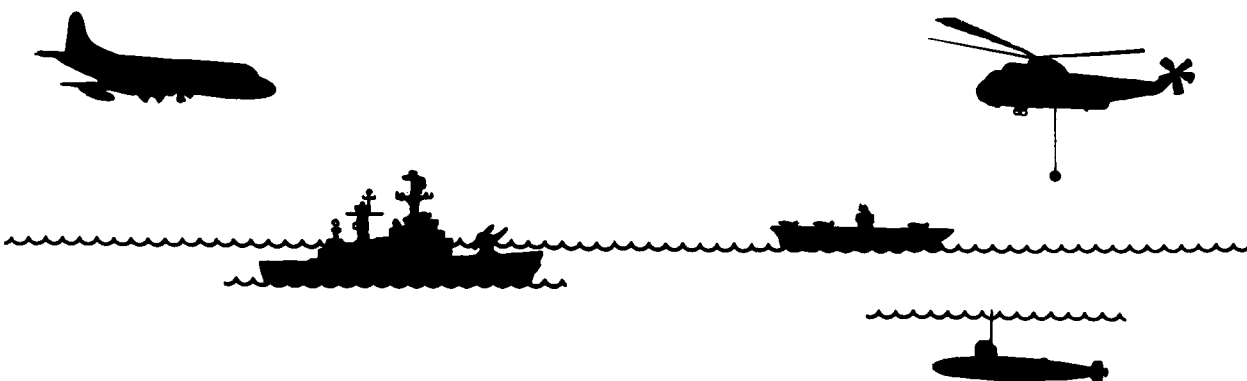
NORDA Technical Note 169



## Tactical ASW Environmental Acoustics Support Project

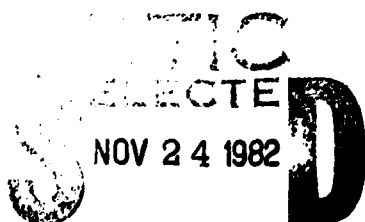
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### SHARPS III Update Review—Autumn 1982



R. M. Holt  
Ocean Data Systems, Inc.

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September 1982

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**SHARPS III UPDATE REVIEW  
AUTUMN 1982**

**Prepared by:**

**R. M. Holt  
Ocean Data Systems, Inc.  
14 September 1982**

**Documentation and model software changes  
contained herein reviewed and approved by:**

**C. C. Wilcox  
NORDA Code 115**

**R. W. McGirr  
NORDA Code 323**

**W. D. Kirby  
Science Applications, Inc.**

**22 September 1982  
in Monterey, California**

**DTIC  
ELECTE**  
NOV 24 1982

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for public release and sale; its  
distribution is unlimited.**

## ABSTRACT

This report documents a series of four update sets prepared for the SHARPS-III model and the SHARPS-III preprocessor at the Naval Ocean Research and Development Center (NORDA) and the Fleet Numerical Oceanography Center (FNOC). The first update, which was incorporated in July, 1982, reduced the length of the SHARPS-III output message by eliminating blank lines. The second modification added a capability to generate active sonobuoy predictions. The remaining two sets changed the method of determining self-noise for hull mounted sonars, and altered the effective ray angles at the sonar and surface used in computing surface reverberation from surface ducted paths. The latter three updates were prepared for implementation in the scheduled 01 Oct 82 SHARPS-III update. Included as appendices to this report are sample SHARPS-III outputs demonstrating the effects of these modifications and listings of the relevant update cards.



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| 2022          |  |
| 2023          |  |
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| 2025          |  |

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## 1.0 INTRODUCTION

The purpose of this report is to provide technical documentation on a series of four updates prepared for the operational version of the SHARPS-III model and the SHARPS-III preprocessor at Fleet Numerical Oceanography Center (FNOC), Monterey, California. Each update addresses a different issue and is independent of the others. Within this document, the following short descriptive titles will be used to reference each update: (1) Message Compaction, (2) ASB (for Active Sonobuoy), (3) Self-Noise, and (4) Ray Angle Treatment. The Message Compaction update was installed independently at FNOC in July, 1982. The other three were combined into a Consolidated Update delivered to FNOC for the scheduled 01 Oct 82 SHARPS update. The following table lists the relevant program file names and cycles as cataloged on the NORDA CDC computer system:

| <u>Update Name</u>  | <u>File* Name</u> | <u>Input Cycle</u> | <u>Output Cycle</u> | <u>ID</u> |
|---------------------|-------------------|--------------------|---------------------|-----------|
| Message Compaction  | SHARPSNORDAPL     | 17                 | 18                  | TEASLIB   |
|                     | SHARPSNORDALGO    | 17                 | 18                  | TEASLIB   |
| Consolidated Update | USERPL            | 17                 | 19                  | TEASLIB   |
|                     | USERLGO           | 17                 | 19                  | TEASLIB   |
|                     | POSTSORTPL        | 17                 | 19                  | TEASLIB   |
|                     | POSTSORTLGO       | 17                 | 19                  | TEASLIB   |
|                     | SHARPSNORDAPL     | 18                 | 19                  | TEASLIB   |
|                     | SHARPSNORDALGO    | 18                 | 19                  | TEASLIB   |
|                     | SHARPSACCPL**     | 4                  | 4                   | TEASLIB   |
|                     | SHARPSACCLGO**    | 4                  | 4                   | TEASLIB   |

\*NOTE: File names ending in "PL" are CDC Program Library files containing source code images. File names ending in "LGO" are binary, or object code files.

\*\*NOTE: These files were not affected by this update. They are shown here to complete the list of SHARPS related program files at NORDA.

The PL's are, to the greatest extent possible, duplicates of the operational versions at FNOC as of April, 1982. The only differences appear in SHARPSNORDAPL where the "LEVEL" statement (declaring extended core storage) was removed and several dummy and simulation routines were added to satisfy external references to unique FNOC subprograms. All such subprograms have only a cosmetic effect on SHARPS and in no way change computed values.

To comply with standard SHARPS update procedures, each update set has been assigned a unique three digit SHARPS Update Number (SUN) that is permanently associated with that set. For each update and affected program, two files have been cataloged at NORDA. The first file contains the update card images and the second is a full binary file created by applying the update images to the baseline PL. Similarly, two files have been generated for the final Consolidated Update set. The binary files have been used to test all updates. The naming convention adopted for these files uses the name of the baseline program followed by either "UPDATE" for the update card images, or "TEST" for the binary. This is followed by the SUN and a single letter that specifies the version of an update set. The binary file names always end with "LGO". The cycle numbers of these files are identical to the cycle numbers of the baseline programs. The following table summarizes program files at NORDA associated with individual update sets:

| <u>Update Name</u>     | <u>SUN</u> | <u>Update Card Image File</u> | <u>Binary File</u>  | <u>Cycle</u> | <u>ID</u> |
|------------------------|------------|-------------------------------|---------------------|--------------|-----------|
| Message<br>Compaction  | 007        | SHARPSUPDATE007A              | SHARPSTEST007ALGO   | 17           | TEASLIB   |
| ASB                    | 008        | USERUPDATE008B                | USERTEST008BLGO     | 17           | TEASLIB   |
|                        |            | POSTSORTUPDATE008B            | POSTSORTTEST008BLGO | 17           | TEASLIB   |
|                        |            | SHARPSUPDATE008C              | SHARPSTEST008CLGO   | 18           | TEASLIB   |
| Self-<br>Noise         | 009        | USERUPDATE009A                | USERTEST009ALGO     | 17           | TEASLIB   |
|                        |            | POSTSORTUPDATE009A            | POSTSORTTEST009ALGO | 17           | TEASLIB   |
|                        |            | SHARPSUPDATE009B              | SHARPSTEST009BLGO   | 18           | TEASLIB   |
| Ray Angle<br>Treatment | 011        | SHARPSUPDATE011C              | SHARPSTEST011CLGO   | 18           | TEASLIB   |
| Consolidated<br>Update | 012        | USERUPDATE012A                | USERTEST012ALGO     | 17           | TEASLIB   |
|                        |            | POSTSORTUPDATE012A            | POSTSORTTEST012ALGO | 17           | TEASLIB   |
|                        |            | SHARPSUPDATE012C              | SHARPSTEST012CLGO   | 18           | TEASLIB   |

By using the naming convention described above, it is convenient to reference a particular program version as program name baseline program cycle . SUN . For example, SHARPS 18.8 refers to SHARPS, cycle 18, with ASB updates applied.

The remainder of this document will describe each update in detail. Four topic areas will be addressed (where applicable) for each update: Problem, Analysis, Solution, and Results. "Problem" will entail an account of how the requirement for each update becomes known, including sample runs to demonstrate the problem where appropriate. "Analysis" will discuss shortcomings in the physics and/or the coding of the programs that created the problem. "Solution" will provide a technical description of modifications to the physics and/or coding employed to correct the problem. "Results" will present sample runs demonstrating the effects of each update. All sample runs are included as appendices to this document. Under this format, Sections 2.0, 3.0, 4.0, and 5.0 will discuss the Message Compaction, Active Sonobuoy, Self-Noise, and Ray Angle Treatment update sets, respectively.

FNOC updating procedures require that a unique update ident be defined for every subroutine and COMDECK that is modified. Each ident consists of the deck name followed by a two digit sequence number that is incremented with each new update. An asterisk may precede the sequence number if the maximum number of characters (nine) is not exceeded. It should be noted that whenever a COMDECK is modified all routines containing that COMDECK are also updated, even if no coding changes are required. This is accomplished by replacing only the "latest change date" card in such routines. Within SHARPS, deck names associated with COMDECKS are preceded by a "\$". Appendix A lists all update idents implemented in conjunction with the July and October, 1982, update sets.

Additional appendices to this publication present sample outputs and update card images. Specifically, updates for Message Compaction, Active Sonobuoys, Self-Noise, and Ray Angle Treatment appear as Appendices C, G, I, and L, respectively. Appendices B and D demonstrate the results of the Message Compaction update. Appendices E, F, and H show sample inputs and outputs relating to the Active Sonobuoy update. The impact of the Self-Noise update is displayed in Appendices J and K. Similarly, Ray Angle Treatment effects are contained in Appendices M and N.

When the Active Sonobuoy, Self-Noise, and Ray Angle Treatment updates are taken as a whole with conflicting updates reconciled, they comprise the final deliverable SHARPS update for FNOC. This version is referenced as 18.12 and will become 19.0 after final test and evaluation of these updates by FNOC. The only conflicting updates occurred in deleting the "latest change date" cards within subroutines that were affected by both the Active Sonobuoy and Self-Noise updates. In these cases, the references to those cards were removed from the Active Sonobuoy correction set when assembling the Consolidated Update set. Appendix O presents sample SHARPS messages from the final SHARPS 18.12 version.

Appendices P, Q, and R contain special tables recording the history of update identifiers installed in programs USER, POSTSORT, and SHARPS, respectively, since the inception of the NORDA configuration management effort for SHARPS. The right side of each table lists the ids for each COMDECK and DECK in columns under the appropriate program version designator. Columns delineated by double lines indicate a consolidated update set that was implemented in the operational model. Version designators are derived from the baseline program cycle number at NORDA, followed by a SHARPS Update Number. The left side of each table provides a quick reference to the DECK names in which each COMDECK appears.

The sonar description files input to SHARPS for all runs displayed in this document are "bogus" files that contain false parameter values and dummy sonar names, but generate message formats similar to those that will be output at FNOC.

## **2.0 MESSAGE COMPACTION**

### **2.1 PROBLEM**

The request to reduce the length of the standard SHARPS output message by eliminating blank lines and excluding the SQS-39 sonar was initiated by a serial letter from FNOC to CNOC, and was confirmed through a telephone conversation with LT B. Northridge on 02 Jun 82. Such a reduction would shorten a SHARPS message by approximately 25% without impacting adversely on user interpretation. The FNOC letter noted that no SQS-39 equipped ships are in operation and recommended eliminating that device from the standard message. Appendix B presents a simulated SHARPS output message prior to July, 1982.

### **2.2 ANALYSIS**

Excess blank lines in the SHARPS message were generated by three format statements in subroutine TITLINE that wrote the title lines of the message and one format statement in subroutine MSGLINE that wrote the prediction line for the dipping sonar. The presence or absence of any sonar in a SHARPS message reflects the contents of the sonar description file, not the status of the SHARPS code.

### **2.3 SOLUTION**

The appropriate format statements in subroutines TITLINE and MSGLINE were updated to avoid the excess blank lines. This effort resulted in the creation of the SHARPS Message Compaction update (SUN=007) which was implemented at FNOC in July, 1982. This correction set also was used to update SHARPS 17.0 at NORDA, resulting in the creation of SHARPS 18.0. Relevant update card images are listed in Appendix C.

A revised input deck was prepared for the SHARPS preprocessor which omitted cards relating to the SQS-39. This input was used to create a new standard sonar description file at FNOC.

### **2.4 RESULTS**

The revised standard message format is illustrated in Appendix D.

### 3.0 ACTIVE SONOBUOYS

#### 3.1 PROBLEM

The impetus to proceed with an active sonobuoy prediction capability within SHARPS was generated largely by file memos from Bill Kirby (SAI) dated 25 Jan 82, 18 Feb 82, and 22 Feb 82. These memos led to decisions concerning which buoys and which modes of operation should be included, and how the output should be formatted. Specifically, it was decided that SSQ-47, SSQ-50, and SSQ-62 prediction capability should be made available for the October, 1982, update. As shown in Appendix H, direct path and counter-detect predictions would be performed for both shallow and deep sonobuoy depths for a single operating frequency and various combinations of pulse lengths and wave forms (either continuous wave (CW) or FM). The different wave forms were to be simulated by using different noise limited recognition differential values. Additionally, the CW predictions for both the SSQ-50 and SSQ-62 were to be considered always noise limited, thus they require no time consuming reverberation calculations.

#### 3.2 ANALYSIS

The basic design features of SHARPS-III make it receptive to new sonars and output formats with relatively minor modifications. The three features of active sonobuoy processing that differ significantly from previously incorporated sonars are (1) the application and display of different pulse lengths within the forecast title line for a sonar, (2) the assumption that certain predictions will always be noise limited, and (3) the fixed depths associated with the sonobuoys that could exceed the bottom depth. Other than those peculiarities, the incorporation of the active sonobuoys was basically harmonious with SHARPS-III structure.

#### 3.3 SOLUTION

Two new title line types and two new message line types were introduced to accommodate the title and prediction line formats, respectively, for the active sonobuoys. Specifically, the SSQ-47 requires title line type 10 and message line type 11; both the SSQ-50 and SSQ-62 require title line type 12 and message line type 13. These must be specified on the system parameter cards

(type 10 cards) input to the SHARPS preprocessor when generating a sonar description file that will drive SHARPS through active sonobuoy predictions. Title line type 10 is designed to contain a single pulse length while title line type 12 will display 4 pulse lengths. This requirement presented a special problem in SHARPS because of the absence of a direct correlation between a title line type and a pulse length. To create such a correlation would have required an additional array in the sonar description file, thus rendering all existing files obsolete. Clearly, such a solution was unacceptable. The alternative was an update to subroutine MSGPRT in which the relative position within the SHARPS message of the first prediction range associated with a title line is used to define search keys to identify sonar description table line numbers that are relevant to that title line. The applicable pulse lengths are then retrieved from those sonar description table lines and passed to subroutine TITLINE for inclusion in the title line.

In a modification designed to allow for the possible inclusion of the three sonobuoys in the standard SHARPS message, various array sizes were increased within programs USER, POSTSORT, and SHARPS to permit up to 75 system parameter cards, 65 electronic parameter cards (type 21), 12 unique sonar depth codes, and 15 title and 35 message lines in the SHARPS output message. At the present time, however, it is anticipated that a separate sonar description file will be established for active sonobuoy predictions.

It is inherent in the design of the sonar description table that each active line, i.e., each line that relates to a direct path, convergence zone, or bottom bounce prediction has associated reverberation lines. SHARPS computes a target echo table for the active line and a reverberation table for the reverberation lines, then examines both tables in determining a reverberation limited detection range, if that range is shorter than the noise limited range. The specifications for the active sonobuoy processing allow the assumption that all direct path, CW forecasts for the SSQ-50 and SSQ-62 are noise limited. This assumption permits a significant savings in execution time because all reverberation calculations that would normally be required to support the aforementioned direct path predictions can be by-passed. The following modifications were implemented to take full advantage of this situation:

The user must punch a value of -99. for recognition differential for reverberation on those type 21 cards (preprocessor input) that relate to direct path, CW forecasts for the SSQ-50 and SSQ-62. This value serves as a sentinel in the preprocessor and SHARPS to skip related reverberation considerations. Specifically, in USER the test to determine if new reverberation lines are needed to support an active line is expanded to consider the value of the reverberation recognition differential. Additionally, updates to SHARPS subroutine RANGER set and test a logical flag that indicates if the current sonar description table line is a "no reverb" line. This flag precludes retrieving a reverberation table from extended core storage when processing such a line, and sets the detection range at the FOM (Figure of Merit), or noise limited range. The diversion from the expected sonar description table contents (i.e., each active line has associated reverberation lines) created an additional problem in subroutine RANGER that could cause an incorrect reverberation table to be used when processing a line that requires reverberation data. This obstacle was overcome by incorporating a definitive test on the required reverberation table that overrides certain assumptions regarding the sonar description table contents inherent in the previous test.

In accommodating the active sonobuoys, USER was updated to recognize seven new sonar depth indicators from type 21 cards. The first three characters of these indicators designate the sonar ("Q47", "Q50", or "Q62") and the fourth character must be either "S", "I", or "D" for shallow, intermediate, or deep, respectively (only the SSQ-62 can use the intermediate depth). The preprocessor derives four new sonar depth codes for the sonar description table from these indicators. Code 40000. specifies a shallow sonobuoy (all three buoys have the same shallow depth setting); 41000. specifies the intermediate depth for the SSQ-62; 42000. specifies a deep SSQ-47; 43000. specifies a deep SSQ-50 or SSQ-62 (which have the same deep setting). Updates to SHARPS subroutine STDEPTH interpret these codes appropriately and assign the actual sonar depths to elements in the sonar depth array (ZSON) and to new sonar depth variables.

SHARPS has a built-in safeguard that automatically relocates any calculated or requested sonar depth to a point at least one meter above the bottom if the sonar is originally at or below the bottom. Such processing is inappropriate for active sonobuoys which have fixed depths and should never be deployed where

the bottom is too shallow. It was decided that if an active sonobuoy depth exceeded the bottom, the associated prediction line(s) would be omitted from the SHARPS message, and an explanatory note would be placed in the dayfile. To accomplish this, an array is defined in subroutine STDEPTH containing the sonar depth codes of any active sonobuoys that are deeper than the bottom. This array is referenced by program SHARPS and subroutine RANGER when sequentially processing sonar description table lines, and all processing is by-passed for lines that relate to an active sonobuoy that exceeds the bottom depth. Furthermore, subroutine MSGLINE examines this array, and skips the writing of any message lines for which the sonar depth is too deep. The dayfile message is generated from MSGLINE.

On additional update necessitated by the incorporation of active sonobuoy predictions was increasing from nine to twelve the number of sonars for which predictions may be specifically requested via the SHPSIN file (TAPE25). This consideration will allow the active sonobuoy capability to be included with the standard message.

This effort resulted in the creation of the Active Sonobuoy updates (SUN = 008) for programs USER, POSTSORT, and SHARPS which were included in the 01 Oct 82 update package. Relevant update card images are listed in Appendix G.

### 3.4 RESULTS

Appendix E presents simulated input to the SHARPS preprocessor for a sonar description file that will drive SHARPS through active sonobuoy predictions for three buoys (designated SBA, SBB, and SBC on the type 10 cards). Note the following features of the input: (1) the platform speed is 0.0 knots, (2) the title lines are type 10 or 12, (3) the message lines are type 11 or 13, (4) new sonar depth indicators are employed (e.g., Q50D), and (5) reverberation recognition differential values of -99. are entered for the noise limited cases. Appendix F contains the full contents of the sonar description file generated by the input in Appendix E. All data shown in Appendices E and F are false. To initiate an operational active sonobuoy capability, a card deck similar in form to Appendix E but containing actual parameters was prepared and delivered to FNOC.

A sample SHARPS Active Sonobuoy Message is presented in Appendix H. Execution time for this message at NORDA was 195 seconds, or about 22 seconds per environment. FNOC execution times should be somewhat longer.

## 4.0 SELF-NOISE

### 4.1 PROBLEM

The issue of high sea state predictions by SHARPS that are overly optimistic and/or in poor agreement with other prediction systems and operating guidelines was discussed in a SHARPS file memo from Bill Kirby (SAI) dated 10 August, 1981. This memo recommended that SHARPS should be modified to use wind speed instead of sea state as the basis for calculating self-noise because of the accuracy of wind speed measurements compared to wave heights, and because wind speed drives self-noise determination in SIMAS. A more specific proposal, which included candidate coding, was presented in a follow-up memo dated 16 June, 1982, which recommended (1) removal from SHARPS of the method of deriving self-noise values for sea states 1 through 9 (i.e., return to using sea states 1 through 5 only), and (2) incorporation of the SIMAS algorithm which contains an inherent extrapolation for determining self-noise at wind speeds above sea state 5. The main reasons for deleting the existing SHARPS high sea state capability are the uncertain validity of the generated self-noise values, and the desirability of improving agreement with other prediction systems.

### 4.2 ANALYSIS

The algorithm which allowed SHARPS to derive and use self-noise values at sea states 1 through 9 was implemented with updates to programs USER, POSTSORT, and SHARPS in December, 1980. These updates introduced a flexible method for allowing the preprocessor to establish the desired self-noise tables for nine sea states in a sonar description file through either (1) values entered directly on cards, (2) values stored in program USER for certain sonars and operating modes, or (3) values calculated within USER. This capability could be removed by "yanking" the appropriate update identifiers, thus restoring the old code. ("Yanking" refers to use of a CDC UPDATE processor that removes all cards associated with specified correction sets, and restores any cards that may have been deleted by those sets.) A few desirable enhancements included in the December 1980 update that were unrelated to the high sea state functions would

be reinstated following the yanks. A problem arising from reverting to the old code was that all sonar description files created and cataloged at FNOC since December, 1980, would be rendered incompatible with the new version of SHARPS unless additional updates were included to allow SHARPS to accept sonar description files with either 5 or 9 sea states.

The candidate coding entailed an update for subroutine SLFNOYS which establishes a table relating sea state to wind speed. For a given wind speed, the bracketing sea state numbers are determined. The final self-noise value is then calculated by two-way interpolation in the self-noise tables based on (first) ship speed at each bracketing sea state and (second) wind speed. The coding generally followed the notation used in SIMAS.

#### 4.3 SOLUTION

The update sets that established the high sea state capability were identified by examining old update listings from December, 1980. A correction set was prepared for each relevant program (USER, POSTSORT, and SHARPS) that yanked these old sets, and selectively reinserted a few minor features that remain necessary. A special addition to subroutine SONIN causes the resultant SHARPS program to determine whether an input sonar description file contains self-noise data for 5 or 9 sea states. If it has 9 sea states, the values for sea states 6 through 9 are read into dummy variables and ignored. Thus, all existing sonar description files remain compatible with the new SHARPS version.

The candidate coding that updated subroutine SLFNOYS received minor modifications to meet ODSI programming standards without changing the premise of the logic.

This effort resulted in the creation of the self-noise updates (SUN = 009) for programs USER, POSTSORT, and SHARPS which were included in the 01 Oct 82 update package. Relevant update card images are listed in Appendix I.

#### 4.4 RESULTS

Test results of the self-noise update are presented in Appendices J (without updates or SHARPS 18.0) and K (with updates or SHARPS 18.9). Data used comprised three identical environments with the exception of wave heights and wind speeds which increased from 5 to 15 feet and 10 to 30 knots, respectively, with successive input profiles. Predicted detection ranges from SHARPS 18.9 (wind speed driven) are longer at the lower wind speed because the wind speed is between sea states 2 and 3, while the SHARPS 18.0 (or sea state driven) case uses sea state 4 to calculate self-noise. At the higher wind speed, the SHARPS 18.9 ranges are shorter because the 30 knot wind speed produced an effective sea state of 7, while SHARPS 18.0 truncated sea state to 5 because the input sonar description file had only 5 sea states. These results are not intended to serve as a definitive statement on the value of this modification, but the increased sensitivity to higher wind speeds is a desirable trend. The ultimate evaluation of the benefits from this self-noise update will require extensive operational application.

## 5.0 RAY ANGLE TREATMENT

### 5.1 PROBLEM

This update was initiated by a SHARPS-III file memo from Bill Kirby dated 11 August 82. The following text paraphrases that memo: The current use of eigenrays in SHARPS is not sufficient to give representative ray angles at the sonar and surface for surface reverberation calculations within a surface duct.

### 5.2 ANALYSIS

The best known source documenting this shortcoming as referenced in the Kirby memo is "Recommended Short Term Repair of NISSM II", A. I. Eller and H. J. Venne Jr., Science Applications, Inc., SAI-83-712-WA, March 1982. This publication showed that the angle treatment in models LIRA and LORA better matched actual surface reverberation data. Ray angles are defined to be functions of the sound speeds at the surface, sonar, and layer depth.

### 5.3 SOLUTION

The following excerpt from the Kirby memo defines the appropriate ray angle calculations:

Angle at the sonar

$$\phi_S = \frac{1}{2} \phi_L$$

where

$$\phi_L = \cos^{-1} \frac{C_S}{C_L}$$

is the surface duct limiting ray path angle, and  $C_S$  and  $C_L$  are the sound speed at the sonar and layer depths. The angle at the surface is

$$\phi_O = \cos^{-1} \frac{C_O}{C_L} \cos \phi_S$$

where additionally  $C_O$  is the sound speed at the surface.

To implement this change, an update was prepared for subroutine EIGEN in which the sonar and surface (target) ray angles assigned to each eigenray are calculated according to the above mathematics whenever (1) the sonar is within the surface layer, (2) the target is at the surface, (3) the AMOS flag is set, and (4) the eigenray vertexes in the layer. The surface angle is always set to the negative of the calculated value.

This effort resulted in the creation of the SHARPS Ray Angle Treatment update (SUN = 011) which was incorporated in the 01 Oct 82 update package. Relevant update card images are listed in Appendix L.

#### 5.4 RESULTS

The impact of this update is shown in surface reverberation tables contained in Appendices M (without updates or SHARPS 18.0) and N (with updates or SHARPS 18.11). The following profile was used in both cases with wind speed set at 24 knots:

| <u>Depth (m)</u> | <u>Sound Speed (m/s)</u> |
|------------------|--------------------------|
| 0.               | 1513.5                   |
| 100.             | 1521.5                   |
| 800.             | 1485.0                   |
| 1000.            | 1482.1                   |
| 1600.            | 1485.7                   |
| 2000.            | 1492.1                   |
| 5000.            | 1541.9                   |

Both tables show surface reverberation data as a function of time for a simulated SQS-23 sonar. The values appear very low because the effects of source level and horizontal beamwidth have not yet been included.

The magnitude of the differences in surface reverberation levels reaches 6. to 7. dB at certain times with the SHARPS 18.11 version generating the higher values. The resulting direct path prediction ranges decreased sharply in many cases. Such changes are expected because the test profile was designed to produce exaggerated surface reverberation effects from ducted paths (deep, strong surface layer and high wind speed) to demonstrate the potential impact of this update. For most environmental conditions, this modification is not expected to make significant changes to SHARPS forecast ranges, but it does represent another step toward improving agreement between prediction models.

This update is not expected to make significant changes to predicted SHARPS ranges, but it represents another step toward improving agreement between prediction models.

**APPENDIX A**

**UPDATE IDENTS**

| <u>Update<br/>Name</u> | <u>SUN</u> | <u>Affected<br/>Program</u> | <u>Update<br/>Idents</u>                                                                                                                                                                                                                                                     |
|------------------------|------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Message<br>Compaction  | 007        | SHARPS                      | TITLINE06<br>MSGLINE16                                                                                                                                                                                                                                                       |
| ASB                    | 008        | USER                        | \$LARAYU02<br>\$TARAYU02<br>USER*12<br>LINEU*04<br>TITLEU*04<br>UNSORTU05                                                                                                                                                                                                    |
|                        |            | POSTSORT                    | \$LARAYP02<br>\$TARAYP02<br>POSTSRT09<br>TITLEP*04<br>LINEP*04<br>UNSORTP05                                                                                                                                                                                                  |
|                        |            | SHARPS                      | SHARBLK11<br>\$MSGTIT06<br>\$OUTDAT2<br>\$SONTAB03<br>SHARP3*24<br>ENVIN*29<br>STDEPTH17<br>RANGER320<br>MSGPRT*22<br>MSGLINE17<br>TITLINE07<br>* CONVERT08<br>* LINE3*03<br>NM2*25<br>* SONIN*11<br>* TITLE3*05<br>* SETDIP*09<br>* SNOYSDP07<br>* SNOYSVD11<br>* VDSLVL*06 |
| Self-Noise             | 009        | USER                        | \$NOYSU*02<br>USER*13                                                                                                                                                                                                                                                        |
|                        |            | POSTSORT                    | \$NOYSP*02<br>POSTSORT10<br>NOISEP*04                                                                                                                                                                                                                                        |

| <u>Update<br/>Name</u> | <u>SUN</u> | <u>Affected<br/>Program</u> | <u>Update<br/>Idents</u>                                                                                                                                                                                    |
|------------------------|------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |            | SHARPS                      | \$SONDES08<br>ENVIN*30<br>NOISE3*07<br>SLFNOYS09<br>SNOYSDP08<br>SONIN*12<br>* SHARP3*25<br>* MSGLINE18<br>* MSGPRT*23<br>* NM2*26<br>* RANGER321<br>* SEXY*07<br>* SNOYSVD12<br>* UNSORT307<br>* VDSLVL*07 |
| Ray Angle<br>Treatment | 011        | SHARPS                      | EIGEN*18                                                                                                                                                                                                    |

\* Note: Indicates an update required only because a resident COMDECK was updated.

..

APPENDIX B  
SAMPLE SHARPS 17.0 OUTPUT

SHARPS III PREDICTION BASED ON 10 11Z SEP 82 DATA

01SP/EOTS 81032700Z M0/ 17.5/1513/ 32/ 17.5/1514, 34/ 17.5/1514  
 90/ 16.0/1510, 140/ 13.9/1504, 180/ 12.2/1499, 200/ 11.5/1497  
 240/ 10.4/1494, 300/ 9.0/1491, 400/ 7.9/1488, 500/ 7.0/1487  
 800/ 5.2/1484, 1200/ 3.9/1486, 2000/ 2.4/1493, 2200/ 2.2/1496  
 3000/ 2.0/1509, 4000/ 1.9/1526, 4206/ 1.9/1529  
 DRX(3260/ 943)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(4206)SLD( 34)  
 DP TGT 95 AVG SVL 1501 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 23/ 32 22/ 24 1/ 12 922/1190

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 M0/1 101/ 39 74/ 39 32/ 39 - 2099/3571  
 M0/2 23/ 28 23/ 28 23/ 28 2099/3571

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 99/ 43 77/ 41 34/ 39 1887/2976  
 RTR 145/ 44 127/ 44 110/ 44 591-604 2417/3571  
 PSV QT 66 - 66/ 45 - 45 NSY 237 -2380/ 49 -2316

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUD 96/ 44 42/ 40 30/ 38 1570/2380  
 RTR 123/ 44 101/ 44 74/ 40 1887/2380

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 130/ 45 99/ 44 34/ 39 2417/3571  
 RST 180/ 45 147/ 45 107/ 45 588-615 2628/4166  
 BR MIN-A/R 35/110 MAXSE-A/R 20/255 MAX-A/R 15/365  
 PSV QT 121 - 604/ 48 - 583 NSY 296 -1785/ 408 -1737

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 192/ 45 168/ 45 127/ 45 2417/3571  
 RST 246/ 45 222/ 45 177/ 45 588-640 2628/4166  
 BR MIN-A/R 35/110 MAXSE-A/R 10/421 MAX-A/R 10/543  
 PSV QT 234 -1190/ 49 -1158 NSY 550 -2976/ 546 -2895

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 186/ 45 181/ 45 167/ 45 2417/3571  
 RST 240/ 45 235/ 45 221/ 45 588-636 2628/4166  
 BR MIN-A/R 35/110 MAXSE-A/R 10/407 MAX-A/R 10/530  
 PSV QT 219 -1190/ 49 -1158 NSY 538 -2976/ 540 -2895

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUD 28/ 34 28/ 34 45 864/ 864  
 RTR 28/ 34 28/ 34 45 946/1158  
 GUD 28/ 34 28/ 34 45 864/ 864  
 RTR 28/ 34 28/ 34 45 946/1158

SNI 23/ 34 DU 6 PSV 1 - 1 CDC 1067 CDM 1190

05FA/FOTS 81032700Z M0/ 20.7/1523/ 81/ 18.5/1518, 101/ 17.6/1516  
 121/ 17.0/1514, 140/ 16.0/1512, 160/ 14.9/1509, 199/ 13.5/1505  
 300/ 11.3/1499, 400/ 9.5/1494, 600/ 5.6/1482, 650/ 5.2/1481  
 700/ 4.8/1481, 800/ 4.1/1479, 1400/ 2.6/1484, 1800/ 2.1/1489  
 2100/ 2.0/1493, 2600/ 1.8/1501, 3000/ 1.5/1507, 5121/ 1.5/1544  
 DRX(3937/ 1183)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(5121)SLD( 0)  
 DP TGT 61 AVG SVL 1506 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 23/ 34 23/ 31 22/ 22 942/1286

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 11/ 34 11/ 34 11/ 34 - 1993/3216  
 MD/2 23/ 28 23/ 28 23/ 28 1993/3216

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 15/ 34 15/ 34 15/ 34 1358/2509  
 RTP 17/ 34 17/ 34 17/ 34 635-646 1782/3136  
 PSV QT 32 - 32/ 32 - 32 NSY 33 -1930/ 33 -1881

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GND 12/ 34 12/ 34 12/ 34 1067/1881  
 RTP 12/ 34 12/ 34 12/ 34 1358/2509

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 23/ 34 23/ 34 23/ 34 2205/3216  
 RTP 21/ 34 21/ 34 21/ 34 - 2417/3860  
 BR MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV QT 33 - 657/ 33 - 33 NSY 33 -1930/ 33 -1254

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 23/ 34 23/ 34 23/ 34 2205/3216  
 RTP 21/ 34 21/ 34 21/ 34 639-668 2417/3860  
 BR MIN-A/R 15/336 MAXSE-A/R 10/462 MAX-A/R 10/517  
 PSV QT 33 -1286/ 33 -1254 NSY 575 -2573/ 584 -2509

SNH ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 23/ 34 23/ 34 23/ 34 2205/3216  
 RTP 21/ 34 21/ 34 21/ 34 639-666 2417/3860  
 BR MIN-A/R 15/336 MAXSE-A/R 10/462 MAX-A/R 10/498  
 PSV QT 33 -1286/ 33 - 685 NSY 555 -2573/ 551 -1881

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GND 45/ 52 45/ 52 27 897/1254  
 RTP 45/ 52 45/ 52 27 989/1254  
 GNDP 45/ 52 45/ 52 27 897/1254  
 RTPP 45/ 52 45/ 52 27 989/1254

SNT 43/ 45 DD 45 PSV 1 - 1 CDC 1015 CDM 1222

ORSP/FOTS 81032700Z M0/ 19.2/1519/ 17/ 19.2/1520, 18/ 19.2/1520  
 40/ 18.2/1517, 60/ 17.5/1515, 89/ 17.0/1514, 120/ 17.0/1515  
 150/ 16.8/1515, 191/ 16.4/1514, 300/ 15.6/1514, 400/ 14.1/1510  
 510/ 12.0/1505, 600/ 9.1/1496, 700/ 6.6/1488, 800/ 5.0/1483  
 900/ 4.4/1482, 1200/ 3.2/1483, 1600/ 2.5/1487, 1900/ 2.1/1490  
 2400/ 1.8/1497, 3475/ 1.6/1515, 4000/ 1.6/1524, 6000/ 1.6/1561  
 6949/ 1.6/1578  
 ORX(3675/ 3273)GR( 2.0)BL(1/1)WH( 1)WS(12)BD(6949)SLD( 18)  
 OP TGT 79 AVG SVL 1523 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 13/ 21 1/ 21 1/ 16 853/1286

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 6/ 28 6/ 27 6/ 24 - 1279/2573  
 MD/2 17/ 22 17/ 22 17/ 22 1226/2573

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 11/ 28 11/ 28 11/ 26 1358/2573  
 BTR 11/ 28 11/ 28 11/ 28 646-648 1887/3216  
 PSV OT 17 - 17/ 32 - 32 NSY 17 -1930/ 33 -1881

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUD 9/ 28 9/ 27 9/ 23 1279/1930  
 BTR 9/ 28 9/ 28 9/ 27 1464/1930

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 17/ 28 17/ 28 17/ 23 1782/3216  
 BTR 12/ 28 12/ 28 12/ 28 632-660 1993/3216  
 BB MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV OT 17 - 17/ 32 - 32 NSY 17 -1286/ 33 -1254

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 17/ 28 17/ 28 17/ 28 1782/3216  
 BTR 12/ 28 12/ 28 12/ 28 631-673 1993/3216  
 BB MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV OT 17 -1286/ 33 - 677 NSY 441 -2573/ 440 -1881

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 17/ 28 17/ 28 17/ 28 1782/3216  
 BTR 12/ 28 12/ 28 12/ 28 631-670 1993/3216  
 BB MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV OT 17 - 688/ 33 - 664 NSY 17 -1930/ 33 -1881

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUD 22/ 57 22/ 57 45 814/1254  
 BTR 22/ 57 22/ 57 45 914/1254  
 GUDP 22/ 57 22/ 56 45 814/1254  
 BTRP 22/ 57 22/ 57 45 914/1254

SVT 22/ 22 DU 5 PSV 1 - 1 CDC 971 CDM 1286

09SM/FOTS 81032700Z M0/ 18.0/1515/ 19/ 18.0/1515. 20/ 18.0/1515  
 40/ 12.8/1499, 60/ 9.4/1488, 80/ 7.1/1480, 120/ 4.3/1469  
 170/ 2.8/1463, 220/ 1.9/1460, 300/ .8/1457, 400/ .4/1457  
 500/ .3/1458, 600/ .2/1459, 700/ .2/1461, 2195/ .1/1485  
 DRX(3942/-1748)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2195)SLD( 20)  
 DP TGT 81 AVG SVL 1470 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 23/ 17 23/ 15 21/ 1 944/ 944

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 93/ 23 74/ 23 42/ 22 - 2787/2787  
 MD/2 23/ 17 23/ 17 23/ 17 2787/2787

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 92/ 27 77/ 24 61/ 23 2417/2417  
 RTP 139/ 27 94/ 27 94/ 27 - 2998/2998  
 PSV QT 218 - 218/ 30 - 30 NSY 473 - 473/ 411 - 411

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUD 89/ 24 70/ 23 30/ 22 1782/1782  
 RTP 95/ 24 94/ 24 74/ 24 2099/2099

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 100/ 28 93/ 28 59/ 23 2998/2998  
 RST 174/ 28 141/ 28 96/ 28 - 3210/3210  
 BB MIN-A/R 35/ 42 MAXSE-A/R 0/211 MAX-A/R 0/261  
 PSV QT 244 - 244/ 210 - 210 NSY 904 - 904/ 626 - 626

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 184/ 28 162/ 28 100/ 28 2998/2998  
 RST 193/ 28 193/ 28 170/ 28 - 3210/3210  
 BB MIN-A/R 15/ 88 MAXSE-A/R 0/211 MAX-A/R 0/261  
 PSV QT 682 - 682/ 440 - 440 NSY 1464 -1464/1015 -1015

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 179/ 28 175/ 28 161/ 28 2998/2998  
 RST 193/ 28 193/ 28 193/ 28 - 3210/3210  
 BB MIN-A/R 15/ 88 MAXSE-A/R 0/211 MAX-A/R 0/261  
 PSV QT 672 - 672/ 417 - 417 NSY 1358 -1358/1015 -1015

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUD 17/ 21 15/ 16 45 729/ 729  
 RTP 17/ 21 17/ 21 45 831/ 831  
 GUDP 17/ 21 10/ 9 45 729/ 729  
 RTPP 17/ 21 16/ 19 45 831/ 831

SNT 23/ 17 DD 5 PSV 7 - 7 CDC 1015 CDM 1015

SRFA/FOTS 81032700Z M0/ 10.4/1492/ 28/ 10.4/1492, 29/ 10.4/1492  
 60/ 8.9/1487, 30/ 8.8/1487, 182/ 8.8/1489  
 DRX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 29)  
 DP TGT 90 AVG SVL 1488 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 1/ 1 1/ 1 1/ 1 464/ 464

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 105/ 47 90/ 47 81/ 47 - 772/ 772  
 MD/2 1/ 1 1/ 1 1/ 1 766/ 766

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 112/ 85 95/ 64 88/ 59 712/ 712  
 RTP 163/120 144/ 95 126/ 92 - 843/ 843  
 PSV OT 112 - 112/ 82 - 82 NSY 321 - 321/ 249 - 249

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUN 95/ 60 88/ 59 76/ 51 574/ 574  
 RTP 122/ 91 99/ 60 89/ 59 652/ 652

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 151/ 98 101/ 66 74/ 49 919/ 919  
 RST 193/147 161/102 99/ 64 - 954/ 954  
 BR MTN-A/R 5/ 4 MAXSE-A/R 0/ 54 MAX-A/R 0/106  
 PSV OT 152 - 152/ 104 - 104 NSY 373 - 373/ 295 - 295

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 199/152 177/129 143/ 95 919/ 919  
 RST 263/204 228/164 180/138 - 954/ 954  
 BR MTN-A/R 5/ 4 MAXSE-A/R 0/ 54 MAX-A/R 0/106  
 PSV OT 274 - 274/ 212 - 212 NSY 550 - 550/ 444 - 444

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 194/148 189/145 178/131 919/ 919  
 RST 254/182 245/179 230/166 - 954/ 954  
 BR MTN-A/R 5/ 4 MAXSE-A/R 0/ 54 MAX-A/R 0/106  
 PSV OT 266 - 266/ 191 - 191 NSY 535 - 535/ 437 - 437

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUN 17/167 17/130 25 397/ 397  
 RTP 17/184 17/167 25 424/ 424  
 GUNP 48/188 48/122 20 408/ 408  
 RTPD 48/197 48/186 20 429/ 429

SNI 56/121 DD 20 PSV 11 - 11 CDC 386 CDM 386

5841/FOTS 81032700Z M0/ 5.5/1473/ 19/ 5.5/1473/ 20/ 5.5/1473  
 40/ 5.8/1475/ 60/ 5.6/1474/ 182/ 5.6/1477  
 ORX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 40)  
 DP TGT 101 AVG SVL 1475 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 1/ 1 1/ 1 1/ 1 482/ 487

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 64/ 84 64/ 84 54/ 84 - 941/ 974  
 MD/2 1/ 84 1/ 84 1/ 83 938/ 974

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 112/ 84 111/ 84 108/ 84 900/ 974  
 BTR 201/193 122/187 118/177 - 1120/1169  
 PSV OT 75 - 194/ 182 - 182 NSY 509 - 779/ 579 - 777

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUD 111/ 84 107/ 84 48/ 84 682/ 682  
 BTR 120/119 112/ 84 108/ 84 753/ 779

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 121/188 112/ 84 40/ 84 1266/1266  
 RST 217/200 122/191 111/ 84 - 1364/1364  
 RB MIN-A/R 42/ 20 MAXSE-A/R 0/ 63 MAX-A/R 0/ 90  
 PSV OT 145 - 194/ 188 - 188 NSY 438 - 682/ 483 - 647

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 221/201 210/198 119/185 1266/1266  
 RST 311/218 232/218 213/199 - 1364/1364  
 RB MIN-A/R 42/ 20 MAXSE-A/R 0/ 63 MAX-A/R 0/ 90  
 PSV OT 321 - 487/ 375 - 518 NSY 703 - 974/ 778 -1036

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 218/200 215/200 211/198 1266/1266  
 RST 308/218 305/218 232/218 - 1364/1364  
 RB MIN-A/R 42/ 20 MAXSE-A/R 0/ 63 MAX-A/R 0/ 90  
 PSV OT 315 - 487/ 313 - 388 NSY 692 - 974/ 723 -1036

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUD 39/128 87/ 86 25 488/ 488  
 BTR 89/161 89/ 89 25 488/ 488  
 GUD 95/130 90/ 78 20 487/ 487  
 BTR 95/145 94/ 87 20 487/ 487

SNT 99/ 72 DD 20 PSV 1 - 1 CDC 487 CDM 487

60SP/FOTS 81032700Z M0/ 17.8/1519/ 19/ 17.8/1519, 20/ 17.8/1519  
 60/ 14.9/1511, 100/ 13.8/1508, 120/ 13.5/1508, 150/ 13.5/1508  
 300/ 13.8/1513, 400/ 13.7/1514, 500/ 13.7/1516, 560/ 13.6/1516  
 600/ 13.5/1517, 900/ 13.0/1520, 1100/ 13.0/1523, 2700/ 13.0/1550  
 DRX( 0/ 0)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(2700)SLD( 20)  
 DP TGT A1 AVG SVL 1528 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 22/ 17 22/ 17 21/ 14 1014/1014

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 33/ 23 33/ 23 32/ 23 - 2029/2029  
 MD/2 23/ 17 23/ 17 23/ 17 2029/2029

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 74/ 28 64/ 26 46/ 23 2029/2029  
 RTD 109/ 28 97/ 28 84/ 28 - 2368/2368  
 PSV OT 66 - 66/ 32 - 32 NSY 995 -1417/ 727 -1288

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GND 69/ 26 51/ 23 25/ 23 1691/1691  
 RTD 88/ 26 69/ 26 55/ 24 1691/1691

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 99/ 28 71/ 28 26/ 23 2368/2368  
 RST 136/ 28 106/ 28 67/ 27 - 2706/2706  
 RR MIN-A/R 35/ 71 MAXSE-A/R 15/271 MAX-A/R 15/289  
 PSV OT 50 - 50/ 32 - 32 NSY 986 -1063/ 724 - 966

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 143/ 28 123/ 28 94/ 28 2368/2368  
 RST 183/ 28 164/ 28 131/ 28 - 2706/2706  
 RR MIN-A/R 35/ 71 MAXSE-A/R 15/338 MAX-A/R 15/367  
 PSV OT 708 - 708/ 644 - 644 NSY 1570 -1771/1358 -1611

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GND 139/ 28 134/ 28 125/ 28 2368/2368  
 RST 178/ 28 175/ 28 165/ 28 - 2706/2706  
 RR MIN-A/R 35/ 71 MAXSE-A/R 15/338 MAX-A/R 15/366  
 PSV OT 708 - 708/ 644 - 644 NSY 1570 -1771/1226 -1611

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GND 17/230 17/187 45 879/ 966  
 RTD 17/267 17/226 45 957/ 966  
 GND 17/190 17/152 45 879/ 966  
 RTD 17/233 17/189 45 957/ 966

SNT 24/ 18 DD 5 PSV 1 - 1 CDC 966 CDM 966

02HC/FOTS 81032700Z M0/ 20.7/1523/ 2700/ 13.0/1550,\*\*\*\*/ 0.0/\*\*\*\*  
 DRX(NA HALF CH)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2700)SLD(2700)  
 DP TGT 305 AVG SVL 1527 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 65/ 1 39/ 1 25/ 1 670/ 670

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 170/124 138/ 97 113/ 70 - 2099/2099  
 MD/2 107/ 1 102/ 1 77/ 1 2099/2099

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 174/125 153/104 120/ 84 1782/1782  
 RTR 244/267 216/249 185/237 - 2311/2311  
 PSV QT 170 - 170/ 92 - 92 NSY 572 - 572/ 733 - 733

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUID 148/124 119/ 97 101/ 67 1015/1015  
 RTR 183/242 155/133 120/100 1358/1358

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 238/239 184/105 120/ 61 2522/2522  
 RST 324/277 268/249 190/112 - 2787/2787  
 RR MIN-A/R 42/ 49 MAXSE-A/R 42/ 71 MAX-A/R 15/301  
 PSV QT 241 - 241/ 121 - 121 NSY 669 - 669/ 735 - 735

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 348/289 305/266 233/237 2522/2522  
 RST 435/437 401/430 318/274 - 2787/2787  
 RR MIN-A/R 42/ 49 MAXSE-A/R 25/137 MAX-A/R 15/366  
 PSV QT 502 - 502/ 448 - 448 NSY 1015 -1015/1226 -1226

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 337/282 327/278 303/265 2522/2522  
 RST 432/437 428/437 399/429 - 2787/2787  
 RR MIN-A/R 42/ 49 MAXSE-A/R 25/137 MAX-A/R 15/366  
 PSV QT 474 - 474/ 435 - 435 NSY 958 - 958/1120 -1120

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUID 167/131 109/101 45 876/ 876  
 RTR 181/148 165/124 45 942/ 942  
 GUIDP 161/116 94/ 86 45 876/ 876  
 RTSP 169/138 116/110 45 942/ 942

SNT 86/ 87 DU 45 PSV 1 - 1 CDC 939 CDM 939

02NG/FOTS 81032700Z M0/ 20.7/1523/ 400/ 16.7/1516,\*\*\*\*\*/ 0.0/\*\*\*\*  
 DPX(NA SHALLOW)GR: 2.0)BL(1/1)WH( 1)WS(13)BD( 400)SLD( 0)  
 DP TGT 61 AVG SVL 1519 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 22/ 21 22/ 21 22/ 21 932/ 932

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 211/223 202/153 193/ 43 - 1676/1676  
 MD/2 198/ 19 20/ 19 20/ 19 1676/1676

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 210/221 204/154 199/148 1279/1279  
 RTP 396/333 380/325 372/228 - 1782/1782  
 PSV OT 200 - 200/ 153 - 153 NSY 878 - 878/ 855 - 855

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUID 210/219 201/152 170/ 56 954/ 954  
 RTP 378/321 211/224 202/153 1173/1173

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 380/327 208/214 34/ 53 1993/1993  
 RST 391/410 383/331 207/155 - 2205/2205  
 BR MIN-A/R 42/ 7 MAXSE-A/R 0/188 MAX-A/R 0/209  
 PSV OT 378 - 378/ 220 - 220 NSY 925 - 925/ 934 - 934

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 392/412 390/403 378/319 1993/1993  
 RST 392/414 392/414 391/407 - 2205/2205  
 BR MIN-A/R 0/ 74 MAXSE-A/R 0/188 MAX-A/R 0/209  
 PSV OT 879 - 879/ 856 - 856 NSY 932 - 932/ 947 - 947

SNH ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUID 391/410 391/409 390/404 1993/1993  
 RST 392/414 392/414 392/414 - 2205/2205  
 BR MIN-A/R 0/ 74 MAXSE-A/R 0/188 MAX-A/R 0/209  
 PSV OT 874 - 874/ 683 - 683 NSY 931 - 931/ 947 - 947

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUID 132/159 114/131 45 1226/1226  
 RTP 132/167 132/155 45 1358/1358  
 GUID 132/147 51/ 83 45 1226/1226  
 RTP 132/164 129/141 45 1358/1358

SNI 72/ 84 DU 45 PSV 1 - 1 CDC 1358 CDM 1358

APPENDIX C

UPDATE CARD IMAGES FOR SHARPS 17.7  
(MESSAGE COMPACTION)

```

*ID TITLINE00
*/
*/ PROGRAMMER - R. MOLT, OCEAN DATA SYSTEMS, INC.
*/ DATE - 22 JUN 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO ELIMINATE BLANK LINES BETWEEN
*/ SONARS IN THE SHARPS MESSAGE TO REDUCE THE OVERALL MESSAGE LENGTH.
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH IDENT MSGLINE15
*/
*I TITLINE.7
C ***** LATEST CHANGE 22JUN 82
*D TITLINE03.1
9001 FORMAT(1X, A4, 3(****, A2, *KTS****), 9(1H-), *CDC/CUM-*)
*D TITLINE03.2
9003 FORMAT(1X, A4, 3(****, A2, *KTS****), *--CZW----CDC/CUM-*)
*D TITLINE05.1
9007 FORMAT(1X, A4, 2(****, A2, *KTS****), *---ID*, 15(1H-),
*ID MSGLINE16
*/
*/ PROGRAMMER - R. MOLT, OCEAN DATA SYSTEMS, INC.
*/ DATE - 22 JUN 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO ELIMINATE BLANK LINES BETWEEN
*/ SONARS IN THE SHARPS MESSAGE TO REDUCE THE OVERALL MESSAGE LENGTH.
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH IDENT TITLINE06
*/
*D MSGLINE15.1
C ***** LATEST CHANGE 22JUN 82
*D MSGLINE10.1
9009 FORMAT(1X, A3, 3X, A3, 1H/, A3, 5X, *DD *, 13, 6X, *PSV *,

```

APPENDIX D  
SAMPLE SHARPS 18.0 OUTPUT

SHARPS III PREDICTION BASED ON 10 11Z SEP 82 DATA

01SP/EOTS 81032700Z M0/ 17.5/1513/ 32/ 17.5/1514, 34/ 17.5/1514  
 30/ 16.0/1510, 140/ 13.9/1504, 180/ 12.2/1499, 200/ 11.5/1497  
 240/ 10.4/1494, 300/ 9.0/1491, 400/ 7.9/1488, 500/ 7.0/1487  
 800/ 5.2/1484, 1200/ 3.9/1486, 2000/ 2.4/1493, 2200/ 2.2/1496  
 3000/ 2.0/1509, 4000/ 1.9/1526, 4206/ 1.9/1529

DRX(3260/ 943)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(4206)SLD( 34)

DP TGT 95 AVG SVL 1501 POD 50.

|        |            |          |       |           |            |            |           |                   |
|--------|------------|----------|-------|-----------|------------|------------|-----------|-------------------|
| SNA    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CDC/CDM-          |
| ALL    | 23/        | 32       |       | 22/       | 24         | 1/         | 12        | 922/1190          |
| SNR    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CZW---CDC/CDM-    |
| M0/1   | 100/       | 39       |       | 74/       | 39         | 32/        | 39        | - 2099/3571       |
| M0/2   | 23/        | 28       |       | 23/       | 28         | 23/        | 28        | 2099/3571         |
| SNC    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CZW---CDC/CDM-    |
| GIN    | 99/        | 43       |       | 77/       | 41         | 34/        | 39        | 1887/2976         |
| RTR    | 145/       | 44       |       | 127/      | 44         | 110/       | 44        | 591-604 2417/3571 |
| PSV QT | 66 -       | 66/      | 45 -  | 45        | NSY        | 237 -2380/ | 49 -2316  |                   |
| SND    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CDC/CDM-          |
| GIN    | 96/        | 44       |       | 42/       | 40         | 30/        | 38        | 1570/2380         |
| RTR    | 123/       | 44       |       | 101/      | 44         | 74/        | 40        | 1887/2380         |
| SNE    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CZW---CDC/CDM-    |
| GIN    | 130/       | 45       |       | 99/       | 44         | 34/        | 39        | 2417/3571         |
| RST    | 180/       | 45       |       | 147/      | 45         | 107/       | 45        | 588-615 2628/4166 |
| BB     | MIN-A/R    | 35/110   |       | MAXSE-A/R | 20/255     | MAX-A/R    | 15/365    |                   |
| PSV QT | 121 -      | 604/     | 48 -  | 583       | NSY        | 296 -1785/ | 408 -1737 |                   |
| SNF    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CZW---CDC/CDM-    |
| GIN    | 192/       | 45       |       | 168/      | 45         | 127/       | 45        | 2417/3571         |
| RST    | 246/       | 45       |       | 222/      | 45         | 177/       | 45        | 588-640 2628/4166 |
| BB     | MIN-A/R    | 35/110   |       | MAXSE-A/R | 10/421     | MAX-A/R    | 10/543    |                   |
| PSV QT | 234 -1190/ | 49 -1158 |       | NSY       | 550 -2976/ | 546 -2895  |           |                   |
| SNH    | ---        | 12KTS    | ----- | 18KTS     | -----      | 24KTS      | -----     | CZW---CDC/CDM-    |
| GIN    | 186/       | 45       |       | 181/      | 45         | 167/       | 45        | 2417/3571         |
| RST    | 240/       | 45       |       | 235/      | 45         | 221/       | 45        | 588-636 2628/4166 |
| BB     | MIN-A/R    | 35/110   |       | MAXSE-A/R | 10/407     | MAX-A/R    | 10/530    |                   |
| PSV QT | 219 -1190/ | 49 -1158 |       | NSY       | 538 -2976/ | 540 -2895  |           |                   |
| SNH    | ---        | 12KTS    | ----- | 18KTS     | -----      | TD-----    | -----     | CDC/CDM-          |
| GIN    | 28/        | 34       |       | 28/       | 34         | 45         |           | 864/ 864          |
| RTR    | 28/        | 34       |       | 28/       | 34         | 45         |           | 946/1158          |
| GINP   | 28/        | 34       |       | 28/       | 34         | 45         |           | 864/ 864          |
| RTRP   | 28/        | 34       |       | 28/       | 34         | 45         |           | 946/1158          |
| SNT    | 23/        | 34       |       | DU        | 6          | PSV        | 1 - 1     | CDC 1067 CDM 1190 |

05FA/FOTS 81032700Z MO/ 20.7/1523/ 81/ 18.5/1518, 101/ 17.6/1516  
 121/ 17.0/1514, 140/ 16.0/1512, 160/ 14.9/1509, 199/ 13.5/1505  
 300/ 11.3/1499, 400/ 9.5/1494, 600/ 5.6/1482, 650/ 5.2/1481  
 700/ 4.8/1481, 800/ 4.1/1479, 1400/ 2.6/1484, 1800/ 2.1/1489  
 2100/ 2.0/1493, 2600/ 1.8/1501, 3000/ 1.5/1507, 5121/ 1.5/1544  
 DPX(3937/ 1183)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(5121)SLD( 0)  
 DP TGT / 61 AVG SVL 1506 POD 50.

|        |           |          |           |                         |
|--------|-----------|----------|-----------|-------------------------|
| SNA    | ---12KTS  | ---18KTS | ---24KTS  | -----CDC/CDM-           |
| ALL    | 23/ 34    | 23/ 31   | 22/ 22    | 942/1286                |
| SNR    | ---12KTS  | ---18KTS | ---24KTS  | -----CZW---CDC/CDM-     |
| MO/1   | 11/ 34    | 11/ 34   | 11/ 34    | - 1993/3216             |
| MO/2   | 23/ 28    | 23/ 28   | 23/ 28    | 1993/3216               |
| SNC    | ---12KTS  | ---18KTS | ---24KTS  | -----CZW---CDC/CDM-     |
| GUO    | 15/ 34    | 15/ 34   | 15/ 34    | 1358/2509               |
| BTR    | 17/ 34    | 17/ 34   | 17/ 34    | 635-646 1782/3136       |
| PSV QT | 32 -      | 32/ 32 - | 32 NSY    | 33 -1930/ 33 -1881      |
| SND    | ---12KTS  | ---18KTS | ---24KTS  | -----CDC/CDM-           |
| GUO    | 12/ 34    | 12/ 34   | 12/ 34    | 1067/1881               |
| BTR    | 12/ 34    | 12/ 34   | 12/ 34    | 1358/2509               |
| SNE    | ---12KTS  | ---18KTS | ---24KTS  | -----CZW---CDC/CDM-     |
| GUO    | 23/ 34    | 23/ 34   | 23/ 34    | 2205/3216               |
| BST    | 21/ 34    | 21/ 34   | 21/ 34    | - 2417/3860             |
| BB     | MIN-A/R   | /        | MAXSE-A/R | /                       |
| PSV QT | 33 - 657/ | 33 -     | 33 NSY    | 33 -1930/ 33 -1254      |
| SNF    | ---12KTS  | ---18KTS | ---24KTS  | -----CZW---CDC/CDM-     |
| GUO    | 23/ 34    | 23/ 34   | 23/ 34    | 2205/3216               |
| RST    | 21/ 34    | 21/ 34   | 21/ 34    | 639-668 2417/3860       |
| BB     | MIN-A/R   | 15/336   | MAXSE-A/R | 10/462 MAX-A/R 10/517   |
| PSV QT | 33 -1286/ | 33 -1254 | NSY       | 575 -2573/ 584 -2509    |
| SNG    | ---12KTS  | ---18KTS | ---24KTS  | -----CZW---CDC/CDM-     |
| GUO    | 23/ 34    | 23/ 34   | 23/ 34    | 2205/3216               |
| BST    | 21/ 34    | 21/ 34   | 21/ 34    | 639-666 2417/3860       |
| BB     | MIN-A/P   | 15/336   | MAXSE-A/R | 10/462 MAX-A/R 10/498   |
| PSV QT | 33 -1286/ | 33 - 685 | NSY       | 555 -2573/ 551 -1881    |
| SNH    | ---12KTS  | ---18KTS | ---TD     | -----CDC/CDM-           |
| GUO    | 45/ 52    | 45/ 52   | 27        | 897/1254                |
| BTR    | 45/ 52    | 45/ 52   | 27        | 989/1254                |
| GUO    | 45/ 52    | 45/ 52   | 27        | 897/1254                |
| RTOP   | 45/ 52    | 45/ 52   | 27        | 989/1254                |
| SNI    | 43/ 45    | DD 45    | PSV       | 1 - 1 CDC 1015 CDM 1222 |

08SF/FOTS 81032700Z M0/ 19.2/1519/ 17/ 19.2/1520, 18/ 19.2/1520  
 40/ 18.2/1517, 60/ 17.5/1515, 89/ 17.0/1514, 120/ 17.0/1515  
 150/ 16.8/1515, 191/ 16.4/1514, 300/ 15.6/1514, 400/ 14.1/1510  
 510/ 12.0/1505, 600/ 9.1/1496, 700/ 6.6/1488, 800/ 5.0/1483  
 900/ 4.4/1482, 1200/ 3.2/1483, 1600/ 2.5/1487, 1900/ 2.1/1490  
 2400/ 1.8/1497, 3475/ 1.6/1515, 4000/ 1.6/1524, 6000/ 1.6/1561  
 6949/ 1.6/1578

DRX(3675/ 3273)GR( 2.0)BL(1/1)WH( 1)WS(12)BD(6949)SLD( 18)  
 DP TGT 79 AVG SVL 1523 POD 50.

|        |           |       |       |           |       |         |            |                    |
|--------|-----------|-------|-------|-----------|-------|---------|------------|--------------------|
| SNA    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CDC/CDM-           |
| ALL    | 13/       | 21    |       | 1/        | 21    | 1/      | 16         | 853/1286           |
| SNR    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CZW---CDC/CDM-     |
| MD/1   | 6/        | 28    |       | 6/        | 27    | 6/      | 24         | - 1279/2573        |
| MD/2   | 17/       | 22    |       | 17/       | 22    | 17/     | 22         | 1226/2573          |
| SNC    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CZW---CDC/CDM-     |
| GUO    | 11/       | 28    |       | 11/       | 28    | 11/     | 26         | 1358/2573          |
| RTR    | 11/       | 28    |       | 11/       | 28    | 11/     | 28         | 646-648 1887/3216  |
| PSV QT | 17 -      |       |       | 17/       | 32 -  | 32      | NSY        | 17 -1930/ 33 -1881 |
| SND    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CDC/CDM-           |
| GUO    | 9/        | 28    |       | 9/        | 27    | 9/      | 23         | 1279/1930          |
| RTR    | 9/        | 28    |       | 9/        | 28    | 9/      | 27         | 1464/1930          |
| SNE    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CZW---CDC/CDM-     |
| GUO    | 17/       | 28    |       | 17/       | 28    | 17/     | 23         | 1782/3216          |
| RST    | 12/       | 28    |       | 12/       | 28    | 12/     | 28         | 632-660 1993/3216  |
| RR     | MIN-A/R   | /     |       | MAXSE-A/R | /     | MAX-A/R | /          |                    |
| PSV QT | 17 -      |       |       | 17/       | 32 -  | 32      | NSY        | 17 -1286/ 33 -1254 |
| SNF    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CZW---CDC/CDM-     |
| GUO    | 17/       | 28    |       | 17/       | 28    | 17/     | 28         | 1782/3216          |
| RST    | 12/       | 28    |       | 12/       | 28    | 12/     | 28         | 631-673 1993/3216  |
| RR     | MIN-A/P   | /     |       | MAXSE-A/R | /     | MAX-A/R | /          |                    |
| PSV QT | 17 -1286/ |       |       | 33 -      | 677   | NSY     | 441 -2573/ | 440 -1881          |
| SNG    | ---       | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----      | CZW---CDC/CDM-     |
| GUO    | 17/       | 28    |       | 17/       | 28    | 17/     | 28         | 1782/3216          |
| RST    | 12/       | 28    |       | 12/       | 28    | 12/     | 28         | 631-670 1993/3216  |
| RR     | MIN-A/P   | /     |       | MAXSE-A/R | /     | MAX-A/R | /          |                    |
| PSV QT | 17 -      | 688/  |       | 33 -      | 664   | NSY     | 17 -1930/  | 33 -1881           |
| SNH    | ---       | 12KTS | ----- | 18KTS     | ----- | TD      | -----      | CDC/CDM-           |
| GUO    | 22/       | 57    |       | 22/       | 57    | 45      |            | 814/1254           |
| RTR    | 22/       | 57    |       | 22/       | 57    | 45      |            | 914/1254           |
| GUOP   | 22/       | 57    |       | 22/       | 56    | 45      |            | 814/1254           |
| RTRP   | 22/       | 57    |       | 22/       | 57    | 45      |            | 914/1254           |
| SNI    | 22/       | 22    |       | DU        | 5     | PSV     | 1 - 1      | CDC 971 CDM 1286   |

09SM/FOTS 81032700Z M0/ 18.0/1515/ 19/ 18.0/1515, 20/ 18.0/1515  
 40/ 12.8/1499, 60/ 9.4/1488, 80/ 7.1/1480, 120/ 4.3/1469  
 170/ 2.8/1463, 220/ 1.9/1460, 300/ .8/1457, 400/ .4/1457  
 500/ .3/1458, 600/ .2/1459, 700/ .2/1461, 2195/ .1/1485  
 DRX(3942/-1748)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2195)SLD( 20)  
 DP TGT 81 AVG SVL 1470 POD 50.

|        |         |       |       |           |       |        |         |                   |
|--------|---------|-------|-------|-----------|-------|--------|---------|-------------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CDC/CDM-          |
| ALL    | 23/     | 17    |       | 23/       | 15    | 21/    | 1       | 944/ 944          |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| MD/1   | 93/     | 23    |       | 74/       | 23    | 42/    | 22      | - 2787/2787       |
| MD/2   | 23/     | 17    |       | 23/       | 17    | 23/    | 17      | 2787/2787         |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUO    | 92/     | 27    |       | 77/       | 24    | 61/    | 23      | 2417/2417         |
| RTD    | 139/    | 27    |       | 94/       | 27    | 94/    | 27      | - 2998/2998       |
| PSV OT | 218 -   | 218/  | 30 -  | 30        | NSY   | 473 -  | 473/    | 411 - 411         |
| SND    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CDC/CDM-          |
| GUO    | 89/     | 24    |       | 70/       | 23    | 30/    | 22      | 1782/1782         |
| RTD    | 95/     | 24    |       | 94/       | 24    | 74/    | 24      | 2099/2099         |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUO    | 100/    | 28    |       | 93/       | 28    | 59/    | 23      | 2998/2998         |
| RST    | 174/    | 28    |       | 141/      | 28    | 96/    | 28      | - 3210/3210       |
| BR     | MIN-A/R | 35/   | 42    | MAXSE-A/R | 0/    | 211    | MAX-A/R | 0/261             |
| PSV OT | 244 -   | 244/  | 210 - | 210       | NSY   | 904 -  | 904/    | 626 - 626         |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUO    | 184/    | 28    |       | 162/      | 28    | 100/   | 28      | 2998/2998         |
| RST    | 193/    | 28    |       | 193/      | 28    | 170/   | 28      | - 3210/3210       |
| BR     | MIN-A/R | 15/   | 88    | MAXSE-A/R | 0/    | 211    | MAX-A/R | 0/261             |
| PSV OT | 582 -   | 682/  | 440 - | 440       | NSY   | 1464 - | 1464/   | 1015 -1015        |
| SNG    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUO    | 179/    | 28    |       | 175/      | 28    | 161/   | 28      | 2998/2998         |
| RST    | 193/    | 28    |       | 193/      | 28    | 193/   | 28      | - 3210/3210       |
| BR     | MIN-A/R | 15/   | 88    | MAXSE-A/R | 0/    | 211    | MAX-A/R | 0/261             |
| PSV OT | 672 -   | 672/  | 417 - | 417       | NSY   | 1358 - | 1358/   | 1015 -1015        |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD     | -----   | CDC/CDM-          |
| GUO    | 17/     | 21    |       | 15/       | 16    | 45     |         | 729/ 729          |
| RTD    | 17/     | 21    |       | 17/       | 21    | 45     |         | 831/ 831          |
| GUOP   | 17/     | 21    |       | 10/       | 9     | 45     |         | 729/ 729          |
| RTOP   | 17/     | 21    |       | 16/       | 19    | 45     |         | 831/ 831          |
| SNI    | 23/     | 17    |       | DD        | 5     | PSV    | 7 - 7   | CDC 1015 CDM 1015 |

58FA/FOTS 81032700Z M0/ 10.4/1492/ 28/ 10.4/1492, 29/ 10.4/1492  
 60/ 8.9/1487, 80/ 8.8/1487, 182/ 8.8/1489  
 DRX(MA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 29)  
 DP TGT 90 AVG SVL 1488 POD 50.

|        |         |            |       |           |       |             |         |                 |
|--------|---------|------------|-------|-----------|-------|-------------|---------|-----------------|
| SNA    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CDC/CDM-        |
| ALL    | 1/      | 1          |       | 1/        | 1     | 1/          | 1       | 464/ 464        |
| SNR    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CZW---CDC/CDM-  |
| MD/1   | 105/    | 47         |       | 90/       | 47    | 81/         | 47      | - 772/ 772      |
| MD/2   | 1/      | 1          |       | 1/        | 1     | 1/          | 1       | 766/ 766        |
| SNC    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CZW---CDC/CDM-  |
| GUO    | 112/    | 85         |       | 95/       | 64    | 88/         | 59      | 712/ 712        |
| RTR    | 163/120 |            |       | 144/ 95   |       | 126/ 92     |         | - 843/ 843      |
| PSV OT | 112 -   | 112/ 82 -  |       | 82 NSY    | 321 - | 321/ 249 -  |         | 249             |
| SND    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CDC/CDM-        |
| GUO    | 95/     | 60         |       | 88/       | 59    | 76/         | 51      | 574/ 574        |
| RTP    | 122/    | 91         |       | 99/       | 60    | 89/         | 59      | 652/ 652        |
| SNE    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CZW---CDC/CDM-  |
| GUO    | 151/    | 98         |       | 101/      | 66    | 74/         | 49      | 919/ 919        |
| BST    | 193/147 |            |       | 161/102   |       | 99/ 64      |         | - 954/ 954      |
| BR     | MIN-A/R | 5/         | 4     | MAXSE-A/R | 0/    | 54          | MAX-A/R | 0/106           |
| PSV OT | 152 -   | 152/ 104 - |       | 104 NSY   | 373 - | 373/ 295 -  |         | 295             |
| SNE    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CZW---CDC/CDM-  |
| GUO    | 199/152 |            |       | 177/129   |       | 143/ 95     |         | 919/ 919        |
| BST    | 263/204 |            |       | 228/164   |       | 180/138     |         | - 954/ 954      |
| BR     | MIN-A/R | 5/         | 4     | MAXSE-A/R | 0/    | 54          | MAX-A/R | 0/106           |
| PSV OT | 274 -   | 274/ 212 - |       | 212 NSY   | 550 - | 550/ 444 -  |         | 444             |
| SNG    | ---     | 12KTS      | ----- | 18KTS     | ----- | 24KTS       | -----   | CZW---CDC/CDM-  |
| GUO    | 194/148 |            |       | 189/145   |       | 178/131     |         | 919/ 919        |
| BST    | 254/182 |            |       | 245/179   |       | 230/166     |         | - 954/ 954      |
| BR     | MIN-A/R | 5/         | 4     | MAXSE-A/R | 0/    | 54          | MAX-A/R | 0/106           |
| PSV OT | 266 -   | 266/ 191 - |       | 191 NSY   | 535 - | 535/ 437 -  |         | 437             |
| SNH    | ---     | 12KTS      | ----- | 18KTS     | ----- | TD          | -----   | CDC/CDM-        |
| GUO    | 17/167  |            |       | 17/130    |       | 25          |         | 397/ 397        |
| RTR    | 17/184  |            |       | 17/167    |       | 25          |         | 424/ 424        |
| GUO    | 48/188  |            |       | 48/122    |       | 20          |         | 408/ 408        |
| RTRP   | 48/197  |            |       | 48/186    |       | 20          |         | 429/ 429        |
| SNI    | 50/121  |            |       | DU 20     |       | PSV 11 - 11 |         | CDC 386 CDM 386 |

58WI/EOTS 81032700Z M0/ 5.5/1473/ 19/ 5.5/1473, 20/ 5.5/1473  
 40/ 5.8/1475, 60/ 5.6/1474, 182/ 5.6/1477  
 DRX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 40)  
 DP TGT 101 AVG SVL 1475 POD 50.

|        |         |          |           |       |         |       |          |                 |
|--------|---------|----------|-----------|-------|---------|-------|----------|-----------------|
| SNA    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CDC/CDM-        |
| ALL    | 1/      | 1        |           | 1/    | 1       | 1/    | 1        | 482/ 487        |
| SNR    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CZW---CDC/CDM-  |
| MD/1   | 64/     | 84       |           | 64/   | 84      | 54/   | 84       | - 941/ 974      |
| MD/2   | 1/      | 84       |           | 1/    | 84      | 1/    | 83       | 938/ 974        |
| SNC    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CZW---CDC/CDM-  |
| GUID   | 112/    | 84       |           | 111/  | 84      | 108/  | 84       | 900/ 974        |
| RTR    | 201/    | 193      |           | 122/  | 187     | 118/  | 177      | - 1120/1169     |
| PSV QT | 75 -    | 194/ 182 | -         | 182   | NSY     | 509 - | 779/ 579 | - 777           |
| SND    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CDC/CDM-        |
| GUID   | 111/    | 84       |           | 107/  | 84      | 48/   | 84       | 682/ 682        |
| RTR    | 120/    | 119      |           | 112/  | 84      | 108/  | 84       | 753/ 779        |
| SNE    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CZW---CDC/CDM-  |
| GUID   | 121/    | 188      |           | 112/  | 84      | 40/   | 84       | 1266/1266       |
| BST    | 217/    | 200      |           | 122/  | 191     | 111/  | 84       | - 1364/1364     |
| BR     | MIN-A/R | 42/ 20   | MAXSE-A/R | 0/ 63 | MAX-A/R | 0/ 90 |          |                 |
| PSV QT | 145 -   | 194/ 188 | -         | 188   | NSY     | 438 - | 682/ 483 | - 647           |
| SNE    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CZW---CDC/CDM-  |
| GUID   | 221/    | 201      |           | 210/  | 198     | 119/  | 185      | 1266/1266       |
| BST    | 311/    | 218      |           | 232/  | 218     | 213/  | 199      | - 1364/1364     |
| BR     | MIN-A/R | 42/ 20   | MAXSE-A/R | 0/ 63 | MAX-A/R | 0/ 90 |          |                 |
| PSV QT | 321 -   | 487/ 375 | -         | 518   | NSY     | 703 - | 974/ 778 | -1036           |
| SNG    | ---     | 12KTS    | -----     | 18KTS | -----   | 24KTS | -----    | CZW---CDC/CDM-  |
| GUID   | 218/    | 200      |           | 215/  | 200     | 211/  | 198      | 1266/1266       |
| BST    | 308/    | 218      |           | 305/  | 218     | 232/  | 218      | - 1364/1364     |
| BR     | MIN-A/R | 42/ 20   | MAXSE-A/R | 0/ 63 | MAX-A/R | 0/ 90 |          |                 |
| PSV QT | 315 -   | 487/ 313 | -         | 388   | NSY     | 692 - | 974/ 723 | -1036           |
| SNH    | ---     | 12KTS    | -----     | 18KTS | -----   | TD    | -----    | CDC/CDM-        |
| GUID   | 89/     | 128      |           | 87/   | 86      | 25    |          | 488/ 488        |
| RTR    | 89/     | 161      |           | 89/   | 89      | 25    |          | 488/ 488        |
| GUIDD  | 95/     | 130      |           | 90/   | 78      | 20    |          | 487/ 487        |
| RTWD   | 95/     | 145      |           | 94/   | 87      | 20    |          | 487/ 487        |
| SNH    | 89/     | 72       |           | DD    | 20      | PSV   | 1 - 1    | CDC 487 CDM 487 |

60SP/FOTS 81032700Z M0/ 17.8/1519/ 19/ 17.8/1519, 20/ 17.8/1519  
 60/ 14.9/1511, 100/ 13.8/1508, 120/ 13.5/1508, 150/ 13.5/1508  
 300/ 13.8/1513, 400/ 13.7/1514, 500/ 13.7/1516, 560/ 13.6/1516  
 600/ 13.5/1517, 900/ 13.0/1520, 1100/ 13.0/1523, 2700/ 13.0/1550  
 DRX( 0/ 0)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(2700)SLD( 20)  
 DP TGT 81 AVG SVL 1528 POD 50.

|        |         |       |       |           |       |         |         |                 |
|--------|---------|-------|-------|-----------|-------|---------|---------|-----------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CDC/CDM-        |
| ALL    | 22/     | 17    |       | 22/       | 17    | 21/     | 14      | 1014/1014       |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| MD/1   | 33/     | 23    |       | 33/       | 23    | 32/     | 23      | - 2029/2029     |
| MD/2   | 23/     | 17    |       | 23/       | 17    | 23/     | 17      | 2029/2029       |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 74/     | 28    |       | 64/       | 26    | 46/     | 23      | 2029/2029       |
| RTR    | 109/    | 28    |       | 97/       | 28    | 84/     | 28      | - 2368/2368     |
| PSV QT | 66 -    | 66/   | 32 -  | 32        | NSY   | 995     | -1417/  | 727 -1288       |
| SND    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CDC/CDM-        |
| GUO    | 69/     | 26    |       | 51/       | 23    | 25/     | 23      | 1691/1691       |
| RTR    | 88/     | 26    |       | 69/       | 26    | 55/     | 24      | 1691/1691       |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 99/     | 28    |       | 71/       | 28    | 26/     | 23      | 2368/2368       |
| RST    | 136/    | 28    |       | 106/      | 28    | 67/     | 27      | - 2706/2706     |
| BB     | MIN-A/R | 35/   | 71    | MAXSE-A/R | 15/   | 271     | MAX-A/R | 15/289          |
| PSV QT | 50 -    | 50/   | 32 -  | 32        | NSY   | 986     | -1063/  | 724 - 966       |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 143/    | 28    |       | 123/      | 28    | 94/     | 28      | 2368/2368       |
| RST    | 183/    | 28    |       | 164/      | 28    | 131/    | 28      | - 2706/2706     |
| BB     | MIN-A/R | 35/   | 71    | MAXSE-A/R | 15/   | 338     | MAX-A/R | 15/367          |
| PSV QT | 708 -   | 708/  | 644 - | 644       | NSY   | 1570    | -1771/  | 1358 -1611      |
| SNG    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 138/    | 28    |       | 134/      | 28    | 125/    | 28      | 2368/2368       |
| RST    | 178/    | 28    |       | 175/      | 28    | 165/    | 28      | - 2706/2706     |
| BB     | MIN-A/R | 35/   | 71    | MAXSE-A/R | 15/   | 338     | MAX-A/R | 15/366          |
| PSV QT | 708 -   | 708/  | 644 - | 644       | NSY   | 1570    | -1771/  | 1226 -1611      |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD----- | -----   | CDC/CDM-        |
| GUO    | 17/     | 230   |       | 17/       | 187   | 45      |         | 879/ 966        |
| RTR    | 17/     | 267   |       | 17/       | 226   | 45      |         | 957/ 966        |
| GUO    | 17/     | 190   |       | 17/       | 152   | 45      |         | 879/ 966        |
| RTR    | 17/     | 233   |       | 17/       | 189   | 45      |         | 957/ 966        |
| SNT    | 24/     | 18    |       | DD        | 5     | PSV     | 1 - 1   | CDC 966 CDM 966 |

02HC/EOTS 01032700Z MO/ 20.7/1523/ 2700/ 13.0/1550,\*\*\*\*\*/ 0.0/\*\*\*\*  
 DRX(NA HALF CH)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2700)SLD(2700)  
 DP TGT 305 AVG SVL 1527 POD 50.

|        |         |       |       |           |       |         |         |                 |
|--------|---------|-------|-------|-----------|-------|---------|---------|-----------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CDC/CDM-        |
| ALL    | 65/     | 1     |       | 39/       | 1     | 25/     | 1       | 670/ 670        |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| MD/1   | 170/124 |       |       | 138/ 97   |       | 113/ 70 |         | 2099/2099       |
| MD/2   | 107/    | 1     |       | 102/      | 1     | 77/     | 1       | 2099/2099       |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 174/125 |       |       | 153/104   |       | 120/ 84 |         | 1782/1782       |
| BTR    | 244/267 |       |       | 216/249   |       | 185/237 |         | 2311/2311       |
| PSV OT | 170 -   | 170/  | 92 -  | 92        | NSY   | 572 -   | 572/    | 733 - 733       |
| SNQ    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CDC/CDM-        |
| GUO    | 148/124 |       |       | 119/ 97   |       | 101/ 67 |         | 1015/1015       |
| BTR    | 183/242 |       |       | 155/133   |       | 120/100 |         | 1358/1358       |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 238/239 |       |       | 184/105   |       | 120/ 61 |         | 2522/2522       |
| RST    | 324/277 |       |       | 268/249   |       | 190/112 |         | 2787/2787       |
| BB     | MIN-A/R | 42/   | 49    | MAXSE-A/R | 42/   | 71      | MAX-A/R | 15/301          |
| PSV OT | 241 -   | 241/  | 121 - | 121       | NSY   | 669 -   | 669/    | 735 - 735       |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 348/289 |       |       | 305/266   |       | 233/237 |         | 2522/2522       |
| RST    | 435/437 |       |       | 401/430   |       | 318/274 |         | 2787/2787       |
| BB     | MIN-A/R | 42/   | 49    | MAXSE-A/R | 25/   | 137     | MAX-A/R | 15/366          |
| PSV OT | 502 -   | 502/  | 448 - | 448       | NSY   | 1015 -  | 1015/   | 1226 -1226      |
| SNQ    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUO    | 337/282 |       |       | 327/278   |       | 303/265 |         | 2522/2522       |
| RST    | 432/437 |       |       | 428/437   |       | 399/429 |         | 2787/2787       |
| BB     | MIN-A/R | 42/   | 49    | MAXSE-A/R | 25/   | 137     | MAX-A/R | 15/366          |
| PSV OT | 474 -   | 474/  | 435 - | 435       | NSY   | 958 -   | 958/    | 1120 -1120      |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD      | -----   | CDC/CDM-        |
| GUO    | 167/131 |       |       | 109/101   |       | 45      |         | 876/ 876        |
| BTR    | 181/148 |       |       | 165/124   |       | 45      |         | 942/ 942        |
| GUOP   | 161/116 |       |       | 94/ 86    |       | 45      |         | 876/ 876        |
| BTOP   | 169/138 |       |       | 116/110   |       | 45      |         | 942/ 942        |
| SNI    | 86/ 87  |       |       | DO 45     |       | PSV     | 1 - 1   | CDC 939 CDM 939 |

02N/80TS 81072700/ 0/ 20.7/1523/ 400/ 16.7/1516,\*\*\*\*/ 0.0/\*\*\*\*

GRRX(1)A SH(1) L(1) J(1) L(1/1)WH(1)WS(1)BD(400)SLD(0)

NP TGT 61 SVL 1519 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-

22/ 2      22/ 21      22/ 21      932/ 932

SN# ---12KTS-----13KTS-----24KTS-----CZW-----CDC/CDM-

147/1 211/223 202/153 193/ 43 - 1670/1676

45/2 198/ 10 20/ 19 20/ 19 1676/1676

SMC --- 12KTS --- 1KTS --- 24KTS --- CZW --- CDC/CDM ---

GIN 210/221 204/154 199/148 1279/1279

BTR 3A6/333 380/325 372/228 - 17A2/1782

PSV DT 200 - 200/ 153 - 153 NSY 878 - 878/ 855 - 855

SN7 ---12KTS-----18KTS-----24KTS-----CDC/COM-

G.D 210/219      201/152      170/ 56      954/ 954

ATR 378/321 211/224 202/153 1173/1173

SME ---12KTS-----18KTS-----24KTS-----CZW-----CDC/CDM-

Grp 14/327 209/214 34/ 53 1993/1993

BSI 391/410 388/331 207/155 - 2205/2205

BB MIN-A/R 42/ 7 MAXSE-A/R 0/188 MAX-A/R 0/209

PCV DT 378 - 378/ 220 - 220 NSY 925 - 925/ 934 - 934

SNF ---12RTS-----19RTS-----24RTS-----C/W- ---EDC/EDM-  
GND 20031115 20031102 20031210 20031100

|     |         |         |         |           |
|-----|---------|---------|---------|-----------|
| GHH | 392/412 | 390/403 | 378/319 | 1993/1993 |
| ECF | 393/414 | 393/414 | 391/407 | 3305/3305 |

88 MIN=118 01 34 MAX65=118 01188 MAX=118 01288

85X 01 838 - 838/ 856 - 856 NSX 833 - 833/ 847 - 847

ENC 134 TS 1 TS 24 KTS 674 CDC /CDM

1001/1001 1002/1002 1003/1003 1004/1004 1005/1005 1006/1006 1007/1007 1008/1008 1009/1009 1010/1010 1011/1011 1012/1012 1013/1013 1014/1014 1015/1015 1016/1016 1017/1017 1018/1018 1019/1019 1020/1020 1021/1021 1022/1022 1023/1023 1024/1024 1025/1025 1026/1026 1027/1027 1028/1028 1029/1029 1030/1030 1031/1031 1032/1032 1033/1033 1034/1034 1035/1035 1036/1036 1037/1037 1038/1038 1039/1039 1040/1040 1041/1041 1042/1042 1043/1043 1044/1044 1045/1045 1046/1046 1047/1047 1048/1048 1049/1049 1050/1050 1051/1051 1052/1052 1053/1053 1054/1054 1055/1055 1056/1056 1057/1057 1058/1058 1059/1059 1060/1060 1061/1061 1062/1062 1063/1063 1064/1064 1065/1065 1066/1066 1067/1067 1068/1068 1069/1069 1070/1070 1071/1071 1072/1072 1073/1073 1074/1074 1075/1075 1076/1076 1077/1077 1078/1078 1079/1079 1080/1080 1081/1081 1082/1082 1083/1083 1084/1084 1085/1085 1086/1086 1087/1087 1088/1088 1089/1089 1090/1090 1091/1091 1092/1092 1093/1093 1094/1094 1095/1095 1096/1096 1097/1097 1098/1098 1099/1099 1100/1100 1101/1101 1102/1102 1103/1103 1104/1104 1105/1105 1106/1106 1107/1107 1108/1108 1109/1109 1110/1110 1111/1111 1112/1112 1113/1113 1114/1114 1115/1115 1116/1116 1117/1117 1118/1118 1119/1119 1120/1120 1121/1121 1122/1122 1123/1123 1124/1124 1125/1125 1126/1126 1127/1127 1128/1128 1129/1129 1130/1130 1131/1131 1132/1132 1133/1133 1134/1134 1135/1135 1136/1136 1137/1137 1138/1138 1139/1139 1140/1140 1141/1141 1142/1142 1143/1143 1144/1144 1145/1145 1146/1146 1147/1147 1148/1148 1149/1149 1150/1150 1151/1151 1152/1152 1153/1153 1154/1154 1155/1155 1156/1156 1157/1157 1158/1158 1159/1159 1160/1160 1161/1161 1162/1162 1163/1163 1164/1164 1165/1165 1166/1166 1167/1167 1168/1168 1169/1169 1170/1170 1171/1171 1172/1172 1173/1173 1174/1174 1175/1175 1176/1176 1177/1177 1178/1178 1179/1179 1180/1180 1181/1181 1182/1182 1183/1183 1184/1184 1185/1185 1186/1186 1187/1187 1188/1188 1189/1189 1190/1190 1191/1191 1192/1192 1193/1193 1194/1194 1195/1195 1196/1196 1197/1197 1198/1198 1199/1199 1200/1200 1201/1201 1202/1202 1203/1203 1204/1204 1205/1205 1206/1206 1207/1207 1208/1208 1209/1209 1210/1210 1211/1211 1212/1212 1213/1213 1214/1214 1215/1215 1216/1216 1217/1217 1218/1218 1219/1219 1220/1220 1221/1221 1222/1222 1223/1223 1224/1224 1225/1225 1226/1226 1227/1227 1228/1228 1229/1229 1230/1230 1231/1231 1232/1232 1233/1233 1234/1234 1235/1235 1236/1236 1237/1237 1238/1238 1239/1239 1240/1240 1241/1241 1242/1242 1243/1243 1244/1244 1245/1245 1246/1246 1247/1247 1248/1248 1249/1249 1250/1250 1251/1251 1252/1252 1253/1253 1254/1254 1255/1255 1256/1256 1257/1257 1258/1258 1259/1259 1260/1260 1261/1261 1262/1262 1263/1263 1264/1264 1265/1265 1266/1266 1267/1267 1268/1268 1269/1269 1270/1270 1271/1271 1272/1272 1273/1273 1274/1274 1275/1275 1276/1276 1277/1277 1278/1278 1279/1279 1280/1280 1281/1281 1282/1282 1283/1283 1284/1284 1285/1285 1286/1286 1287/1287 1288/1288 1289/1289 1290/1290 1291/1291 1292/1292 1293/1293 1294/1294 1295/1295 1296/1296 1297/1297 1298/1298 1299/1299 1300/1300 1301/1301 1302/1302 1303/1303 1304/1304 1305/1305 1306/1306 1307/1307 1308/1308 1309/1309 1310/1310 1311/1311 1312/1312 1313/1313 1314/1314 1315/1315 1316/1316 1317/1317 1318/1318 1319/1319 1320/1320 1321/1321 1322/1322 1323/1323 1324/1324 1325/1325 1326/1326 1327/1327 1328/1328 1329/1329 1330/1330 1331/1331 1332/1332 1333/1333 1334/1334 1335/1335 1336/1336 1337/1337 1338/1338 1339/1339 1340/1340 1341/1341 1342/1342 1343/1343 1344/1344 1345/1345 1346/1346 1347/1347 1348/1348 1349/1349 1350/1350 1351/1351 1352/1352 1353/1353 1354/1354 1355/1355 1356/1356 1357/1357 1358/1358 1359/1359 1360/1360 1361/1361 1362/1362 1363/1363 1364/1364 1365/1365 1366/1366 1367/1367 1368/1368 1369/1369 1370/1370 1371/1371 1372/1372 1373/1373 1374/1374 1375/1375 1376/1376 1377/1377 1378/1378 1379/1379 1380/1380 1381/1381 1382/1382 1383/1383 1384/1384 1385/1385 1386/1386 1387/1387 1388/1388 1389/1389 1390/1390 1391/1391 1392/1392 1393/1393 1394/1394 1395/1395 1396/1396 1397/1397 1398/1398 1399/1399 1400/1400 1401/1401 1402/1402 1403/1403 1404/1404 1405/1405 1406/1406 1407/1407 1408/1408 1409/1409 1410

|     |         |         |         |           |
|-----|---------|---------|---------|-----------|
| GNP | 3917410 | 3917404 | 3907404 | 1993/1993 |
| FST | 3934414 | 3934414 | 3934414 | 2205/2205 |

BB MIN-A/R 0/74 MAXSE-A/R 0/188 MAX-A/R 0/209

PSV RI 874 - 874/ 683 - 683 NSY 931 - 931/ 947 - 947

SN4 ---12KTS---18KTS-----TD-----CDC/CDM-

|     |         |         |    |           |
|-----|---------|---------|----|-----------|
| GRD | 132/155 | 114/131 | 45 | 1226/1226 |
|-----|---------|---------|----|-----------|

|     |         |         |    |           |
|-----|---------|---------|----|-----------|
| 813 | 132/167 | 132/155 | 45 | 1358/1358 |
|-----|---------|---------|----|-----------|

|       |         |        |    |           |
|-------|---------|--------|----|-----------|
| GROUP | 132/147 | 51/ 83 | 45 | 1226/1226 |
|-------|---------|--------|----|-----------|

|      |         |         |    |            |
|------|---------|---------|----|------------|
| ATOD | 132/154 | 129/141 | 45 | 134.9/1358 |
|------|---------|---------|----|------------|

SNI 12/84 NC 45 PSV 1 - 1 CDC 1358 CDM 1358

**APPENDIX E**  
**SAMPLE PREPROCESSOR INPUT FOR ACTIVE SONOBUOYS**

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|                                                       |                 |          |           |
|-------------------------------------------------------|-----------------|----------|-----------|
| 10 SRA ASBY-A SHAL                                    | 1 2 1A BL 1 00  | 1 DIRECT | 11 2 10 1 |
| 10 SRA ASBY-A SHAL                                    | 2 1 1A 1 00     | 1 CD     | 11 2 10 1 |
| 10 SRA ASBY-A DEEP                                    | 3 2 1A BL 1 00  | 1 DIRECT | 11 3 10 1 |
| 10 SBA ASBY-A DEEP                                    | 4 1 1A 1 00     | 1 CD     | 11 3 10 1 |
| 10 SRA ASBY-B SHAL                                    | 5 2 1A BL 1 00  | 2 DIRECT | 13 5 12 4 |
| 10 SRA ASBY-B SHAL                                    | 6 2 1A BL 1 00  | 2 DIRECT | 13 5 12 4 |
| 10 SRA ASBY-B SHAL                                    | 7 2 1A BL 1 00  | 2 DIRECT | 13 5 12 4 |
| 10 SRA ASBY-B SHAL                                    | 8 2 1A BL 1 00  | 2 DIRECT | 13 5 12 4 |
| 10 SRA ASBY-B SHAL                                    | 9 1 1A 1 00     | 2 CD     | 13 5 12 4 |
| 10 SRA ASBY-B DEEP                                    | 10 2 1A BL 1 00 | 2 DIRECT | 13 6 12 4 |
| 10 SRA ASBY-B DEEP                                    | 11 2 1A BL 1 00 | 2 DIRECT | 13 6 12 4 |
| 10 SRA ASBY-B DEEP                                    | 12 2 1A BL 1 00 | 2 DIRECT | 13 6 12 4 |
| 10 SRA ASBY-B DEEP                                    | 13 2 1A BL 1 00 | 2 DIRECT | 13 6 12 4 |
| 10 SRA ASBY-B DEEP                                    | 14 1 1A 1 00    | 2 CD     | 13 6 12 4 |
| 10 SRC ASBY-C SHAL                                    | 15 2 1A BL 1 00 | 2 DIRECT | 13 8 12 7 |
| 10 SRC ASBY-C SHAL                                    | 16 2 1A BL 1 00 | 2 DIRECT | 13 8 12 7 |
| 10 SRC ASBY-C SHAL                                    | 17 2 1A BL 1 00 | 2 DIRECT | 13 8 12 7 |
| 10 SRC ASBY-C SHAL                                    | 18 2 1A BL 1 00 | 2 DIRECT | 13 8 12 7 |
| 10 SRC ASBY-C SHAL                                    | 19 1 1A 1 00    | 2 CD     | 13 8 12 7 |
| 10 SRC ASBY-C DEEP                                    | 20 2 1A BL 1 00 | 2 DIRECT | 13 9 12 7 |
| 10 SRC ASBY-C DEEP                                    | 21 2 1A BL 1 00 | 2 DIRECT | 13 9 12 7 |
| 10 SRC ASBY-C DEEP                                    | 22 2 1A BL 1 00 | 2 DIRECT | 13 9 12 7 |
| 10 SRC ASBY-C DEEP                                    | 23 2 1A BL 1 00 | 2 DIRECT | 13 9 12 7 |
| 10 SRC ASBY-C DEEP                                    | 24 1 1A 1 00    | 2 CD     | 13 9 12 7 |
| P1 10475 14.0 1 0 0 22.0 22.0 360. .100 180.0-4.014.  |                 |          |           |
| P1 20475 14.0 1 0 0 22.0 .100 180.0 25                |                 |          |           |
| P1 30470 14.0 1 0 0 22.0 22.0 360. .100 180.0-4.014.0 |                 |          |           |
| P1 40470 14.0 1 0 0 22.0 .100 180.0 25                |                 |          |           |
| P1 50505 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-13.-99.  |                 |          |           |
| P1 60505 9.0 1 0 0 27.0 27.0 360. .500 210.0-10.-99.  |                 |          |           |
| P1 70505 9.0 1 0 0 27.0 27.0 360. .100 210.0-3.0-99.  |                 |          |           |
| P1 80505 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-8.0-5.0  |                 |          |           |
| P1 90505 9.0 1 0 0 27.0 1.00 210.0 25                 |                 |          |           |
| P1 100500 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-13.-99. |                 |          |           |
| P1 110500 9.0 1 0 0 27.0 27.0 360. .500 210.0-10.-99. |                 |          |           |
| P1 120500 9.0 1 0 0 27.0 27.0 360. .100 210.0-3.0-99. |                 |          |           |
| P1 130500 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-5.0-5.0 |                 |          |           |
| P1 140500 9.0 1 0 0 27.0 1.00 210.0 25                |                 |          |           |
| P1 150625 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-15.-99. |                 |          |           |
| P1 160625 9.0 1 0 0 27.0 27.0 360. .500 210.0-13.-99. |                 |          |           |
| P1 170625 9.0 1 0 0 27.0 27.0 360. .100 210.0-6.0-99. |                 |          |           |
| P1 180625 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-10.-10. |                 |          |           |
| P1 190625 9.0 1 0 0 27.0 1.00 210.0 25                |                 |          |           |
| P1 200620 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-15.-99. |                 |          |           |
| P1 210620 9.0 1 0 0 27.0 27.0 360. .500 210.0-13.-99. |                 |          |           |
| P1 220620 9.0 1 0 0 27.0 27.0 360. .100 210.0-6.0-99. |                 |          |           |
| P1 230620 9.0 1 0 0 27.0 27.0 360. 1.00 210.0-10.-10. |                 |          |           |
| P1 240620 9.0 1 0 0 27.0 1.00 210.0 25                |                 |          |           |
| 70 1 1 01 590 620 650 680 700 -5                      |                 |          |           |
| 30 2 1 01 650 680 720 750 770 -5                      |                 |          |           |

APPENDIX F

SAMPLE PREPROCESSOR OUTPUT FOR ACTIVE SONOBUOYS

TITLE ARRAYS

| SORTYP | SPEEDS | NO. | FORMAT |
|--------|--------|-----|--------|
| SBA    | 1      | 10  |        |
| SBB    | 4      | 12  |        |
| SBC    | 7      | 12  |        |

LINE ARRAYS

| LWCODE | KLO | KHI | MLIND | NOTITLE | MTYPE |
|--------|-----|-----|-------|---------|-------|
| 1      | 4   | 2   | 1     | 11      |       |
| 5      | 6   | 3   | 1     | 11      |       |
| 9      | 18  | 5   | 2     | 13      |       |
| 19     | 28  | 6   | 2     | 13      |       |
| 29     | 38  | 8   | 3     | 13      |       |
| 39     | 48  | 9   | 3     | 13      |       |

SELF-NOISE TABLE DIRECTORY

| TABLE NO. | STARTING INDEX | NO ENTRIES |
|-----------|----------------|------------|
| 1         | 1              | 1          |
| 2         | 2              | 1          |

COMPOSITE SELF-NOISE TABLE

| INDEX | SPEED | NOISE BY SEA STATE |     |     |     |
|-------|-------|--------------------|-----|-----|-----|
|       | 1     | 2                  | 3   | 4   | 5   |
| 1     | 1.    | 59.                | 62. | 65. | 70. |
| 2     | 1.    | 65.                | 69. | 72. | 77. |

NO. OF DISTINCT SONAR DEPTHS = 3

| CODE   | MAX BR ANG. |
|--------|-------------|
| 400001 | 27.000000   |
| 420001 | 22.000000   |
| 430001 | 27.000000   |

| SORTED SONAR DESCRIPTION TABLE |         |      |        |        |        |        |       |       |       |       |        |       |      |       |        |        |       |       |        |    |
|--------------------------------|---------|------|--------|--------|--------|--------|-------|-------|-------|-------|--------|-------|------|-------|--------|--------|-------|-------|--------|----|
| ZSON                           | 2TGT    | PATH | XDPANG | YVBHWN | RDPAWG | RVAWMD | PULN  | TYPE  | NSPTR | SPEED | SACLEV | RDWN  | RDWR | EMWMD | NONVB  | OUTPUT | IROUT | NOCHS | SYSCHD |    |
| 1 40000.                       | 0.      | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 401   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | -3    | 0000  | 1      | 00 |
| 2 40000.                       | 0.      | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 401   | 2     | 0      | 210.0 | -4.  | -4.   | 360.00 | -3     | -3    | 0000  | 14     | 00 |
| 3 40000.                       | 0.      | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 401   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -1     | -1    | 0000  | 4      | 00 |
| 4 40000.                       | 10.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 310   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -3     | 13    | 37    | 2      | 00 |
| 5 40000.                       | 1A.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 310   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -3     | 13    | 17    | 17     | 00 |
| 6 40000.                       | 1A.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 320   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -3     | 13    | 38    | 10     | 00 |
| 7 40000.                       | 10.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 320   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -3     | 13    | 18    | 17     | 00 |
| 8 40000.                       | 1A.     | 1    | 14.0   | 0.     | 22.00  | 0.     | 0.00  | 1.000 | 310   | 2     | 0      | 180.0 | 25.  | 0.    | 0.00   | -1     | 3     | 3     | 4      | 00 |
| 9 40000.                       | 1A.     | 1    | 14.0   | 0.     | 22.00  | 0.     | 0.00  | 1.000 | 320   | 1     | 0      | 180.0 | 25.  | 0.    | 0.00   | -1     | 3     | 4     | 10     | 00 |
| 10 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -6.  | -6.   | 360.00 | -4     | 11    | 33    | 3      | 00 |
| 11 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -3.  | -3.   | 360.00 | -2     | 11    | 13    | 14     | 00 |
| 12 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -13. | -99.  | 360.00 | -4     | 9     | 31    | 9      | 00 |
| 13 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -99.  | 360.00 | -2     | 9     | 11    | 14     | 00 |
| 14 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -15. | -99.  | 360.00 | -4     | 7     | 29    | 9      | 00 |
| 15 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -13. | -99.  | 360.00 | -2     | 7     | 9     | 14     | 00 |
| 16 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 7     | 35    | 14     | 00 |
| 17 40000.                      | 10.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -4.  | -4.   | 360.00 | -3     | 7     | 15    | 14     | 00 |
| 18 40000.                      | 10.     | 2    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 110   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -1     | 1     | 1     | 4      | 00 |
| 19 40000.                      | 100.    | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 402   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 7     | 0000  | 2      | 00 |
| 20 40000.                      | 100.    | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 402   | 2     | 0      | 210.0 | -4.  | -4.   | 360.00 | -3     | 7     | 0000  | 14     | 00 |
| 21 40000.                      | 100.    | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 402   | 2     | 0      | 210.0 | -4.  | 14.   | 360.00 | -1     | 0000  | 0000  | 4      | 00 |
| 22 40000.                      | 1000.   | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 403   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 7     | 0000  | 2      | 00 |
| 23 40000.                      | 1000.   | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 403   | 2     | 0      | 210.0 | -5.  | -5.   | 360.00 | -3     | 7     | 0000  | 14     | 00 |
| 24 40000.                      | 1000.   | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 403   | 2     | 0      | 180.0 | -4.  | 14.   | 360.00 | -1     | 0000  | 0000  | 4      | 00 |
| 25 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -4.  | -99.  | 360.00 | -4     | 12    | 34    | 2      | 00 |
| 26 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -13. | -99.  | 360.00 | -2     | 12    | 14    | 14     | 00 |
| 27 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -13. | -99.  | 360.00 | -4     | 10    | 32    | 9      | 00 |
| 28 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -99.  | 360.00 | -2     | 10    | 12    | 14     | 00 |
| 29 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -15. | -99.  | 360.00 | -4     | 8     | 30    | 14     | 00 |
| 30 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -13. | -99.  | 360.00 | -2     | 8     | 10    | 14     | 00 |
| 31 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 8     | 34    | 14     | 00 |
| 32 40000.                      | 30000.  | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -5.  | -5.   | 360.00 | -3     | 8     | 16    | 14     | 00 |
| 33 40000.                      | 30000.  | 2    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 110   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -1     | 2     | 2     | 4      | 00 |
| 34 40000.                      | 30000.  | 2    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 7     | 0000  | 2      | 00 |
| 35 40000.                      | 100000. | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 404   | 2     | 0      | 210.0 | -5.  | -5.   | 360.00 | -3     | 7     | 0000  | 14     | 00 |
| 36 40000.                      | 100000. | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 404   | 2     | 0      | 210.0 | -4.  | 14.   | 360.00 | -1     | 0000  | 0000  | 4      | 00 |
| 37 40000.                      | 100000. | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 404   | 2     | 0      | 180.0 | -4.  | 14.   | 360.00 | -1     | 0000  | 0000  | 4      | 00 |
| 38 40000.                      | 1A.     | 1    | 14.0   | 0.     | 22.00  | 0.     | 0.00  | 1.000 | 310   | 1     | 0      | 180.0 | 25.  | 0.    | 0.00   | -2     | 0     | 7     | 2      | 00 |
| 39 40000.                      | 1A.     | 1    | 14.0   | 0.     | 22.00  | 0.     | 0.00  | 1.000 | 320   | 1     | 0      | 180.0 | 25.  | 0.    | 0.00   | -2     | 0     | 8     | 10     | 00 |
| 40 40000.                      | 1A.     | 2    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 110   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -2     | 4     | 0000  | 3      | 00 |
| 41 40000.                      | 100.    | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 402   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -2     | 4     | 0000  | 2      | 00 |
| 42 40000.                      | 1000.   | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 403   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -2     | 4     | 0000  | 2      | 00 |
| 43 40000.                      | 30000.  | 2    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 110   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -2     | 4     | 0000  | 2      | 00 |
| 44 40000.                      | 100000. | 1    | 14.0   | 0.     | 22.00  | 0.     | 22.00 | 1.000 | 404   | 1     | 0      | 180.0 | -4.  | 14.   | 360.00 | -2     | 4     | 0000  | 2      | 00 |
| 45 40000.                      | 0.      | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 401   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -4     | 7     | 0000  | 14     | 00 |
| 46 40000.                      | 0.      | 1    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 401   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -4     | 7     | 0000  | 14     | 00 |
| 47 40000.                      | 1A.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 310   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -4     | 20    | 47    | 2      | 00 |
| 48 40000.                      | 1A.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 310   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -4     | 20    | 27    | 17     | 00 |
| 49 40000.                      | 1A.     | 1    | 9.0    | 0.     | 27.00  | 0.     | 0.00  | 1.000 | 320   | 2     | 0      | 210.0 | 25.  | 0.    | 0.00   | -4     | 20    | 48    | 10     | 00 |
| 50 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -4.  | -99.  | 360.00 | -3     | 18    | 28    | 17     | 00 |
| 51 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -4.  | -99.  | 360.00 | -3     | 18    | 43    | 3      | 00 |
| 52 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -13. | -99.  | 360.00 | -3     | 16    | 23    | 14     | 00 |
| 53 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 16    | 41    | 19     | 00 |
| 54 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -10. | -10.  | 360.00 | -3     | 16    | 21    | 14     | 00 |
| 55 40000.                      | 1A.     | 2    | 9.0    | 0.     | 27.00  | 0.     | 27.00 | 1.000 | 110   | 2     | 0      | 210.0 | -15. | -99.  | 360.00 | -3     | 14    | 39    | 9      | 00 |

| SORTED SONAR DESCRIPTION TABLE |         |      |      |        |        |        |         |        |      |       |       |        |      |        |       |        |       |       |         |
|--------------------------------|---------|------|------|--------|--------|--------|---------|--------|------|-------|-------|--------|------|--------|-------|--------|-------|-------|---------|
| ZSON                           | ZTGT    | PATH | FREQ | XDPRNG | KVBHWD | RDPRNG | RVARHED | PULLEN | TYPE | NSPTR | SPEED | SHCLEV | RDNR | ENHWD  | MORVS | OUTPUT | IROUT | NOCHS | \$YSCDS |
| 56 43000.                      | 1A.     | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -99. | 340.00 | -3    | 14     | 19    | 14    | 2       |
| 57 43000.                      | 1B.     | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -10. | 340.00 | -4    | 14     | 45    | 14    | 3       |
| 58 43000.                      | 1B.     | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -5.  | 340.00 | -4    | 14     | 25    | 14    | 2       |
| 59 43000.                      | 100.    | 1    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 402  | 2     | 0     | 210.0  | -10. | 340.00 | -4    | 0000   | 0000  | 2     | 00      |
| 60 43000.                      | 100.    | 1    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 402  | 2     | 0     | 210.0  | -5.  | 340.00 | -4    | 0000   | 0000  | 14    | 00      |
| 61 43000.                      | 1000.   | 1    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 403  | 2     | 0     | 210.0  | -10. | 340.00 | -4    | 0000   | 0000  | 2     | 00      |
| 62 43000.                      | 1000.   | 1    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 403  | 2     | 0     | 210.0  | -5.  | 340.00 | -4    | 0000   | 0000  | 14    | 00      |
| 63 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -6.  | 340.00 | -3    | 19     | 44    | 2     | 3       |
| 64 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -3.  | 340.00 | -3    | 19     | 24    | 14    | 2       |
| 65 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -13. | 340.00 | -3    | 17     | 42    | 9     | 3       |
| 66 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -10. | 340.00 | -3    | 17     | 22    | 14    | 2       |
| 67 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -15. | 340.00 | -3    | 15     | 40    | 19    | 3       |
| 68 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -13. | 340.00 | -3    | 15     | 20    | 14    | 2       |
| 69 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -10. | 340.00 | -4    | 15     | 46    | 14    | 3       |
| 70 43000.                      | 30000.  | 2    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 110  | 2     | 0     | 210.0  | -5.  | 340.00 | -4    | 15     | 26    | 14    | 2       |
| 71 43000.                      | 100000. | 1    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 404  | 2     | 0     | 210.0  | -10. | 340.00 | -4    | 0000   | 0000  | 2     | 00      |
| 72 43000.                      | 100000. | 1    | 9.0  | 0.     | 27.00  | 0.     | 27.00   | 1.000  | 404  | 2     | 0     | 210.0  | -5.  | 340.00 | -4    | 0000   | 0000  | 14    | 00      |

APPENDIX G  
UPDATE CARD IMAGES FOR USER 17.8, POSTSORT 17.8,  
AND SHARPS 18.8  
(ACTIVE SONOBUOYS)

```

*ID $IARAYU02
*O $IARAYU01.1.2
COMMON / LARAYS / LNM0DE(15), KLOW(15), KHIGH(15), NOTITLE(15),
MLINO(15), MTYPE(15)
*ID $IARAYU02
*O $IARAYU01.1.2
COMMON / TARAYS / SONTYP(15), SPED1(15), SPEED2(15), SPEED3(15),
TLINO(15), TTYPE(15)
*ID USER=12
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
// PREDICTIONS FOR ACTIVE SONOBUOYS.
// THIS UPDATE INTRODUCES TITLE LINE TYPES 10 (Q47) AND 12(Q50 AND
// Q62), AND MESSAGE LINE TYPES 11(Q47) AND 13(Q50 AND Q62). THE Q47
// PREDICTION CONSISTS OF DIRECT PATH RANGES AGAINST A SHALLOW AND
// DEEP TARGET FOR A SINGLE CW PULSE LENGTH FOR BOTH A SHALLOW AND
// DEEP HYDROPHONE, AND COUNTER DETECT RANGES. FOR BOTH THE Q50 AND
// Q62, THE PREDICTION CONSISTS OF DIRECT PATH RANGES AGAINST A SHALLOW
// AND DEEP TARGET FOR 3 CW PULSE LENGTHS AND 1 FM PULSE LENGTH FOR
// BOTH A SHALLOW AND DEEP HYDROPHONE, AND COUNTER DETECT RANGES.
// THE MAX NUMBER OF TYPE 10 INPUT CARDS IS INCREASED FROM 60 TO 75,
// AND TYPE 21 INPUT CARDS FROM 55 TO 65. FOR CW PULSES FOR THE Q50
// AND Q62, THE USER SHOULD SPECIFY A RECOGNITION DIFFERENTIAL FOR
// REVERB OF -99, 00. THIS SERVES AS A FLAG INDICATING THE
// PREDICTION WILL ALWAYS BE NOISE LIMITED, AND USER WILL NOT
// GENERATE ANY REVERBERATION LINES FOR THE SONAR DESCRIPTION TABLE
// TO SUPPORT THE DIRECT PATH LINES FOR THESE CASES.
// THIS UPDATE RECOGNIZES 7 NEW SONAR DEPTH INDICATORS TO BE PUNCHED
// IN COLUMNS 6-9 OF TYPE 21 CARDS. THE FIRST 3 CHARACTERS DESIGNATE
// THE SONAR (Q47, Q50, OR Q62), THE 4TH CHARACTER CAN BE S, I, OR D,
// FOR SHALLOW, INTERMEDIATE, OR DEEP, RESPECTIVELY. (ONLY THE Q62
// USES THE INTERMEDIATE DEPTH.) PROGRAM USER DERIVES 4 NEW SONAR
// DEPTH CODES FOR THE SONAR DESCRIPTION TABLE - 40000, INDICATES A
// SHALLOW SONOBUOY, 41000, INDICATES THE INTERMEDIATE DEPTH FOR THE
// Q62, 42000, INDICATES A DEEP Q47, AND 43000, INDICATES A DEEP Q50
// OR Q62. ACTUAL DEPTHS ARE ASSIGNED IN SHARPS.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
// $IARAYU02, $IARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
// $IARAYP02, $IARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
// POSTSONT1, MSGTIT06, SOUTDAT2, $SONTAR03, SHARBLK11, SHARP3*24,
// ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPTW17, TITLINE07,
// LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETOIP*09, SNOYSOP07,
// SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3,
//
*O USER*11.3
C ***** LATEST CHANGE - 01 OCT 82
*O USER*06.1.4
DIMENSION SCODE(75), STYPE(75), SINST(75), SMODE(75), ISPARM(75),
1 NOZT(75), ZT(2,75), NOSPD(75), SPEED(3,75),
2 NOYSID(75), PREDTYP(75), MSGTYP(75), MSGLINO(75),
3 TTLTYP(75), TTLINO(75)
*O USER*09.7.10
DIMENSION IZS(65), FRE(165), NOOPANG(65), XDEPANG(8,65),
1 XDEPANG(A,65), XVMMWD(65), HVMMWD(65), EHMMWD(65),
2 PULLEN(65), SWCLEV(65), RDNN(65),
3 RDNR(65), RMWK(3,65)
*O USER*06.12
DIMENSION NSAVE(75), ZRVB(4)
*O USER*09.11

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      DIMENSION IZS(10), SLCODE(3)
*01 USER*09.09
      DATA IZSCODE / 4H V13, 11T, 1LP, 4H0475, 4H047D, 4H050S,
1          4H050D, 4H0A25, 4H0A2D, 4H062I /
*01 USER*11.12
      DATA MAXJ /15/, MAXK /35/, MAXSNT /25/, MAXSUP /150/
*01 USER*11.17
      DATA MAXSYS /75/, MAXLEC /65/
*01 USER*232.233
*01 USER*09.78
*01 USER*235
      2          EMBWID(I), PULSLEN(I), SRCLEV(I), RDNR(I),
      3          RUNR(I), (RMRK(J,I), J=1,3)
9030 FORMAT(I2, 1X, I2, A4, 1X, F4.0, 1X, I1, 2(1X, F2.0),
1          4(1X, F4.0) 1X, A5, 2F4.0, 1X, 2A10, A3)
*01 USER*672.673
      IF (RDNR(I) .NE. 0) ENCODE(5,0160,P(17)) RDNR(I)
8160 FORMAT(F5.1)
*01 USER*09.112
      PRINT 8170, (RMRK(J,I), J=1,3), I, IZS(I), FREQ(I), NOOPANG(I),
*01 USER*09.113
8170 FORMAT(2X, 3A10, /, 4X, I2, 5X, A4, 3X, F5.2, 4X, I1, 5X,
*01 USER*712
8180 FORMAT(33X, 3(A3,1H),, A3, 2X, 3(A3,1H),, A3)
*01 USER*07.1
      IF (I1 .EQ. 11) INC = 4
      IF (I1 .EQ. 13) INC = 10
*01 USER*967
*01 USER*981
C
C      IF PTYPE INDICATES ACTIVE PREDICTION, DECREMENT
C      REVERBERATION POINTER (REVERB POINTER IS KEPT IN THE
C      NEGATIVE), BUT IF RECOGNITION DIFFERENTIAL FOR REVERB IS
C      -99., IT INDICATES A SPECIAL CASE IN WHICH THE ACTIVE SONAR
C      IS ASSUMED TO BE NOISE LIMITED, THEREFORE REVERB LINES ARE
C      NOT GENERATED.
C
      IF ( (PTYPE .GE. 100) .AND. (PTYPE .LE. 199) .AND.
1          (RDNR(IN3) .NE. -99.) ) NR= NR - 1
*01 USER*09.114
      IF (IZS(IN3) .EQ. IZSCODE(1)) ZSUSE = 20000.
C
C      ALL SHALLOW SONOBUOY DEPTHS SHARE THE SAME CODE BECAUSE
C      THEY HAVE THE SAME DEPTH.
C      THE Q50 AND Q62 DEEP DEPTH SHARE THE SAME CODE BECAUSE
C      THEY HAVE THE SAME DEPTH.
C
      IF (IZS(IN3) .EQ. IZSCODE(4)) ZSUSE = 40000.
      IF (IZS(IN3) .EQ. IZSCODE(5)) ZSUSE = 42000.
      IF (IZS(IN3) .EQ. IZSCODE(6)) ZSUSE = 40000.
      IF (IZS(IN3) .EQ. IZSCODE(7)) ZSUSE = 43000.
      IF (IZS(IN3) .EQ. IZSCODE(8)) ZSUSE = 40000.
      IF (IZS(IN3) .EQ. IZSCODE(9)) ZSUSE = 43000.
      IF (IZS(IN3) .EQ. IZSCODE(10)) ZSUSE = 41000.
C
      IF (ZSUSE .NE. 0.0) GO TO 4070
*01 USER*09.168.172
*01 USER*990
*01 USER*1093
C
C      IF RECOGNITION DIFFERENTIAL FOR REVERB IS -99., IT SIGNALS
C      ACTIVE SONOBUOYS THAT ARE NOISE LIMITED (CW PULSE FOR
C      Q50 AND Q62). SKIP REVERB LINES.
C
      IF (RDNR(IN3) .EQ. -99.) GO TO 4540
*01 USER*

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C      IF THE 14TH ELECTRONIC PARAMETER SET HAS A RECOGNITION
C      DIFFERENTIAL FOR REVERB OF -99., NO REVERB LINES EXIST FOR
C      THAT SET.
C
C      IF (RDNH(IX) .EQ. -99.) GO TO 4510
C
C      *C USFR
C      *ID LINEU*04
C      /*
C      /* PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
C      /* DATE - 01 OCT 82
C      /*
C      /* THE PURPOSE OF THIS UPDATE IS TO MAKE MINOR ADJUSTMENTS TO FORMAT
C      /* STATEMENTS TO ACCOMMODATE VALUES THAT MAY BE ENCOUNTERED WITH ACTIVE
C      /* SONOBUOY INPUTS.
C      /*
C      /* THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
C      /* USFR*12, SLARAYU02, STARAYU02, TITLEU*04, UNSORTU05 IN USER1
C      /* SLARAYP02, STARAYP02, POSTSRT00, TITLEP*04, LINEP*04, UNSORTP05 IN
C      /* POSTSHT1 MSGTIT06, SOUTDAT2, SSONTAB03, SHARHLK11, SHARP3*24,
C      /* ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPHT17, TITLINE07,
C      /* LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
C      /* SNOYSVD11, VDSLVL*06, CONVERT00 IN SHARP3,
C      /*
C      *D LINEU*03.1
C      C      ***** LATEST CHANGE - 01 OCT 82
C      *D LINEU*02.1
C      C      2 35(1X, A10, 2(2X,13), 3X, 12, 6X, 12, 5X, 12, / 1)
C
C      *C LINEU
C      *ID TITLEU*04
C      /*
C      /* PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
C      /* DATE - 01 OCT 82
C      /*
C      /* THE PURPOSE OF THIS UPDATE IS TO MAKE MINOR ADJUSTMENTS TO FORMAT
C      /* STATEMENTS TO ACCOMMODATE VALUES THAT MAY BE ENCOUNTERED WITH ACTIVE
C      /* SONOBUOY INPUTS.
C      /*
C      /* THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
C      /* USFR*12, SLARAYU02, STARAYU02, LINEU*04, UNSORTU05 IN USER1
C      /* SLARAYP02, STARAYP02, POSTSRT00, TITLEP*04, LINEP*04, UNSORTP05 IN
C      /* POSTSHT1 MSGTIT06, SOUTDAT2, SSONTAB03, SHARHLK11, SHARP3*24,
C      /* ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPHT17, TITLINE07,
C      /* LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
C      /* SNOYSVD11, VDSLVL*06, CONVERT00 IN SHARP3,
C      /*
C      *D TITLEU*03.1
C      C      ***** LATEST CHANGE - 01 OCT 82
C      *D TITLEU*02.4
C      C      1 *NO., 2X, *FORMAT*, //, 15(2X,A3,5X,3(A2,1X),2X,
C
C      *C TITLEU
C      *ID UNSORTU05
C      /*
C      /* PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
C      /* DATE - 01 OCT 82
C      /*
C      /* THE PURPOSE OF THIS UPDATE IS TO MAKE MINOR ADJUSTMENTS TO FORMAT
C      /* STATEMENTS TO ACCOMMODATE VALUES THAT MAY BE ENCOUNTERED WITH ACTIVE
C      /* SONOBUOY INPUTS.
C      /*
C      /* THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
C      /* USFR*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, IN USER1
C      /* SLARAYP02, STARAYP02, POSTSHT09, TITLEP*04, LINEP*04, UNSORTP05 IN
C      /* POSTSHT1 MSGTIT06, SOUTDAT2, SSONTAB03, SHARHLK11, SHARP3*24,
C      /* ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPHT17, TITLINE07,
C      /* LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,

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\*/ SANYSV011, VDSLVL006, CONVERT08 IN SHAMP3.

\*/

\*/ UNSORTU04.1

/\* \*\*\*\*\* LATEST CHANGE - 01 OCT 82

\*/ UNSORTU04.5.6

\*/ UNSORTU02.12

Q

A

R

\*/ UNSORTU

2X, 2(F3.0,2X,F5.2,2X), F5.3, 1X, 13, 2X,  
14, 3X, 12, 4X, F5.1, 2(2X,F4.0), 1X, F6.2, 2X, 13,  
3X, 13, 2X, 14, 2X, 12 / 1)

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*ID $LAWAYP02
*ID $LAWAYP01.1.2
  COMMON / LAWAYS / LNMDEF(35), KLOW(35), KHIGH(35), NOTITLE(35),
    *      *      *      *      *      *      *      *      *      *
*ID $STARAYP02
*ID $STARAYP01.1.2
  COMMON / TARAYS / SONTYP(15), SPEED1(15), SPEED2(15), SPEED3(15),
    *      *      *      *      *      *      *      *      *      *
*ID POSTSHT09
*//
*// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
*// DATE - 01 OCT 82
*//
*// THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM PREDICTIONS
*// FOR ACTIVE SONORUOYS. IT INCREASED THE SIZE OF CERTAIN ARRAYS TO
*// ACCOMMODATE THE EXPANDED SONAR DESCRIPTION TABLE.
*//
*// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*// USPR012, SLARAYU02, STARAYU02, LINEU004, TITLEU004, UNSORTU05 IN USER1
*// SLARAYP02, STARAYP02, TITLEP004, LINEP004, UNSORTP05 IN
*// POSTSORT1 SMSHTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3024,
*// ENVIN029, MSGLINE17, MSGPRT022, RANGER320, STDEPTH17, TITLINE07,
*// LINE3003, NM2025, SONIN011, TITLE3005, SETDIP009, SNOYSDP07,
*// SNOYSVD11, VDSLVL006, CONVERT08 IN SHARP3.
*//
*ID POSTSRT08.3
C      *      *      *      *      *      *      *      *      *      *
*// LATEST CHANGE - 01 OCT 82
*ID POSTSRT08.5
  DIMENSION CODESON(12), BBMAN0(12)
*ID POSTSRT08.4
  DIMENSION NEGNOS(100), NOS(250), NEGSORT(100), NOSORT(250),
*ID POSTSRT08.34
  DATA MAXNEC /100/, MAXNOS /250/, MAXRVB /50/, MAXPLE /70/
*ID POSTSRT08.40
  DATA MAXSON /12/
*ID POSTSRT08.6
  DO 1210 I=2,MAXSON
*OC POSTSRT
*ID TITLEP004
*//
*// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
*// DATE - 01 OCT 82
*//
*// THE PURPOSE OF THIS UPDATE IS TO MAKE MINOR ADJUSTMENTS TO FORMAT
*// STATEMENTS TO ACCOMMODATE VALUES THAT MAY BE ENCOUNTERED WITH ACTIVE
*// SONORUOY INPUTS.
*//
*// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*// USPR012, SLARAYU02, STARAYU02, LINEU004, TITLEU004, UNSORTU05 IN USER1
*// SLARAYP02, STARAYP02, POSTSHT09, LINEP004, UNSORTP05 IN
*// POSTSRT1 SMSHTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3024,
*// ENVIN029, MSGLINE17, MSGPRT022, RANGER320, STDEPTH17, TITLINE07,
*// LINE3003, NM2025, SONIN011, TITLE3005, SETDIP009, SNOYSDP07,
*// SNOYSVD11, VDSLVL006, CONVERT08 IN SHARP3.
*//
*ID TITLEP003.1
C      *      *      *      *      *      *      *      *      *      *
*// LATEST CHANGE - 01 OCT 82
*ID TITLEP002.4
  *NO., 2X, *FORMAT, //, 15(2X, A3, 5X, 3(A2, 1X), 2X,
*OC TITLEP
*ID LINEP004
*//
*// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)

```

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// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO MAKE MINOR ADJUSTMENTS TO FORMAT
// STATEMENTS TO ACCOMMODATE VALUES THAT MAY BE ENCOUNTERED WITH ACTIVE
// SONOBUOY INPUTS.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
// USFR#12, SLARAYU02, STARAYU02, LINEU#04, TITLEU#04, UNSORTU05 IN USER;
// SLARAYP02, STARAYP02, POSTSR09, TITLEP#04, UNSORTP05 IN
// POSTSORT; SMSRTIT06, SOUTDAT2, SSONTAR03, SHARBLK11, SHARP3#24,
// ENVIN#29, MSGLINE17, MSGPRT#22, RANGER320, STDEPTH17, TITLINE07,
// LINE3#03, NM2#25, SONIN#11, TITLE3#05, SETDIP#09, SNOYSDP07,
// SNOYSVD11, VDSLVL#06, CONVERT08 IN SHARP3,
//
//D LINEP#03.1
C      ***** LATEST CHANGE - 01 OCT 82
//D LINEP#02.1      35(1X, A10, 2(2X,13), 3X, 12, 6X, 12, 5X, 12, /) )
//C LINEP
//D UNSORTP05
//
// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO MAKE MINOR ADJUSTMENTS TO FORMAT
// STATEMENTS TO ACCOMMODATE VALUES THAT MAY BE ENCOUNTERED WITH ACTIVE
// SONOBUOY INPUTS.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
// USFR#12, SLARAYU02, STARAYU02, LINEU#04, TITLEU#04, UNSORTU05 IN USER;
// SLARAYP02, STARAYP02, POSTSR09, TITLEP#04, LINEP#04, IN
// POSTSORT; SMSRTIT06, SOUTDAT2, SSONTAR03, SHARBLK11, SHARP3#24,
// ENVIN#29, MSGLINE17, MSGPRT#22, RANGER320, STDEPTH17, TITLINE07,
// LINE3#03, NM2#25, SONIN#11, TITLE3#05, SETDIP#09, SNOYSDP07,
// SNOYSVD11, VDSLVL#06, CONVERT08 IN SHARP3,
//
//D UNSORTP04.1
C      ***** LATEST CHANGE - 01 OCT 82
//D UNSORTP04.5
//D UNSORTP02.9.10
1      B(13.0, 2X, F5.2, 2X), F5.3, 1X, 13, 2X, 14, 3X, 12, 4X,
2      F5.1, 2(1X, F4.0), 1X, F6.2, 2X, 13, 3X, 13,
3      2(1X, 14), 4X, 12)
//C UNSORTP

```

```

*ID SHARBLK11
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
*/ PREDICTIONS FOR ACTIVE SONOBUOYS.
*/ ID SHARBLK11 DEFINES THE CODED SONOBUOY DEPTHS AND INCREASES THE
*/ ALLOWABLE NUMBER OF TITLE LINES, MESSAGE LINES, AND SONAR DEPTH
*/ CODES.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*/ USPR*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
*/ SLARAYP02, STARAYP02, POSTSHT09, TITLEP*04, LINEP*04, UNSORTP05 IN
*/ POSTSORT1, SMSGTIT06, SOUTDAT2, SSONTAB03, SHARP3*24,
*/ ENVIN*29, MSGLINE17, MSGPRT*22, RANRER320, STDEPTM17, TITLINE07,
*/ LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
*/ SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3,
*/
*O SHARBLK10.1
C ***** LATEST CHANGE - 01 OCT 82
*O SHARBLK10.14.15
DATA MAXJUP / 15 /, MAXKUP / 35 /, MAXNUP / 350 /, MAXSNT / 25 /,
1 MAXSUP / 150 /, MAXSON / 10 /
*O SHARBLK09.2
DATA ZSONCOD / 6,, 10000,, 11000,, 15000,, 16000,, 20000,,
1 40000,, 41000,, 42000,, 43000, /
*O SHARBLK09.9.14
C
C 40000. IS THE DEPTH CODE FOR THE Q47, SHALLOW.
C 42000. IS THE DEPTH CODE FOR THE Q47, DEEP
C 40000. IS THE DEPTH CODE FOR THE Q50, SHALLOW
C 43000. IS THE DEPTH CODE FOR THE Q50, DEEP
C 40000. IS THE DEPTH CODE FOR THE Q62, SHALLOW
C 43000. IS THE DEPTH CODE FOR THE Q62, DEEP
C 41000. IS THE DEPTH CODE FOR THE Q62, INTERMEDIATE
C
DATA NSCODE / 10 /
C
C NSCODE IS THE NUMBER OF SONAR DEPTH CODES CONTAINED IN
C ZSONCOD THAT SHARPS CAN RECOGNIZE.
C
*O SHARBLK
*ID SMSGTIT06
*O SMSGTIT01.1,2
*O SMSGTIT04.1
*O SMSGTIT05.1
COMMON / MSGTITL / JUP, SONTYP(15), SPEED1(15), SPEED2(15),
1 SPEED3(15), LINOT(15), NOTFRMT(15), INTRSTM(15),
2 KUP, LNMODE(35), KLOW(35), KHIGH(35), LINOM(35),
3 NOTITLE(35), NOMFRMT(35), MSGSKIP, EXPMS0(17),
4 PLSTIT(4)
*O SMSGTIT.34
C
C PLSTIT CONTAINS PULSE LENGTHS THAT MUST BE INSERTED IN
C THE TITLE LINES FOR ACTIVE SONOBUOYS
C
*ID SOUTDAT2
*O SOUTDAT1.1
COMMON / OUTDATA / DRANGE(250), IROUT(250)
*ID SSONTAB03
*O SSONTAB02.1,4
COMMON / SONTABL / IZSON(10), ZSON(10), CSON(10), OSON(10),

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1      CUDFSON(10), ZSONCOD(10), HMMANG(10),
2      CZMGN(2,10), CZEND(2,10), VBUTMIN(10),
3      NUSON, Z13, Z35, Z35PM, Z735, Z775PM,
4      ZMULL, NSCODE, ZASBS, ZQ621, ZQ47D, ZASBD,
5      MDGTBD(4), NMDGTB
*/ SSONTA02.14
C      ZSONCOD(7) THRU (10) CONTAIN DEPTH CODES FOR ACTIVE SONOBUOYS
C      ZSONCOD(7) CONTAINS THE DEPTH CODE FOR
C      SHALLOW ACTIVE SONOBUOYS.
C      ZSONCOD(8) CONTAINS THE DEPTH CODE FOR THE Q62, INT
C      ZSONCOD(9) CONTAINS THE DEPTH CODE FOR THE Q47, DEEP
C      ZSONCOD(10) CONTAINS THE DEPTH CODE FOR THE Q50, DEEP
C      AND THE Q62 DEEP.
C
*/ SSONTA02.21
C      ZASBS IS THE DEPTH (IN KM) OF THE SHALLOW SONOBUOYS
C      ZQ621 IS THE DEPTH (IN KM) OF THE Q62, INTERMEDIATE
C      ZQ47D IS THE DEPTH (IN KM) OF THE Q47, DEEP
C      ZASBD IS THE DEPTH (IN KM) OF THE Q50 AND Q62, DEEP
C      MDGTBD IS AN ARRAY CONTAINING THE DEPTH CODES OF ANY AND
C      ALL ACTIVE SONOBUOYS THAT ARE DEEPER THAN THE BOTTOM.
C      NMDGTB IS THE NUMBER OF ENTRIES IN MDGTBD,
*/ ID SHARP3*24
C
C      PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
C      DATE - 01 OCT 82
C
C      THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
C      PREDICTIONS FOR ACTIVE SONOBUOYS.
C      ID SHARP3*24 TESTS FOR SONOBUOY DEPTHS THAT EXCEED THE BOTTOM DEPTH.
C      IF SUCH A CASE IS FOUND, ALL PROCESSING IS SKIPPED FOR THAT BUOY
C      DEPTH.
C
C      THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
C      USFR012, SLARAYU02, STARAYU02, LINEP04, TITLEP04, UNSORTU05 IN USER1
C      SLARAYP02, STARAYP02, POSTSAT09, TITLEP04, LINEP04, UNSORTP05 IN
C      POSTSORT1, SMSATIT06, SOUTDAT2, SSONTAB03, SHARBLK11,
C      ENVIN029, MSGLINE17, MSGPRT022, RANGEB320, STDEPTH17, TITLINE07,
C      LINE3003, NM2025, SONIN011, TITLE3005, SETDIP009, SNOYSOP07,
C      SNOYSVD11, VDBLVL006, CONVERT08 IN SHARP3.
C
C      SHARP3*23.1
C      ***** LATEST CHANGE - 01 OCT 82
C      SHARP3*07.12
C
C      IF THIS LINE IS FOR AN ACTIVE SONOBUOY WHOSE DEPTH EXCEEDS
C      THE BOTTOM, SKIP ALL PROCESSING.
C
C      IF (NMDGTB .EQ. 0) GO TO 190
C      DO 180 J = 1,NMDGTB
C      IF (ZSONTB(1) .EQ. MDGTBD(J)) GO TO 2000
C      180 CONTINUE
C
C      190 CONTINUE
C
C      SHARP3
C      ID ENVIN029
C
C      PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
C      DATE - 01 OCT 82
C
C      THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
C      PREDICTIONS FOR ACTIVE SONOBUOYS.
C      ID ENVIN029 EXPANDS THE SIZE OF THE SONAR SUBSET THAT MAY BE
C      SPECIFIED FROM 4 TO 12 SONARS.

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*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*/ USFR#12, SLARAYU02, STARAYU02, LINEU#04, TITLEU#04, UNSORTU05 IN USE#1
*/ SLARAYP02, STARAYP02, POSTSRT09, TITLEP#04, LINEP#04, UNSORTP05 IN
*/ POSTSRT#1, MSGTIT06, SOUTDAT2, SSONTA03, SHARHLK11, SHARP3#24,
*/ MSGLINE17, MSGPRT#22, RANGER320, STDEPTH17, TITLINE07,
*/ LINE3#03, NM2#25, SONIN#11, TITLE3#05, SETDIP#09, SNOYSOP07,
*/ SNOYSVD11, VDSLVL#06, CONVERT00 IN SHARP3,
*/
*/ ENVIN#28.1
C ***** LATEST CHANGE - 01 OCT 82
*/ ENVIN#07.17
DIMENSION STYP(12), ITYP(12), NEDRVB(25)
*/ ENVIN#07.71.72
READ(25,9050) SUBID, CSIG, (STYP(I),I=1,12)
9050 FORMAT(A4, A1, 1X, 12(A3,2X) )
*/ ENVIN#14.39
READ(25,9050) SUBID,CSIG, (STYP(I),I=1,12)
*/ ENVIN#07.118
DO 130 I=1,12
*/ ENVIN#07.383
, SONAR CODES =*,12(A3,2X) )
*/
*/ ENVIN
*/ ID STDEPTH17
*/
*/ PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
*/ PREDICTIONS FOR ACTIVE SONOBUOYS.
*/ ID STDEPTH17 ASSIGNS SONAR DEPTHS TO ACTIVE SONOBUOYS BASED ON CODED
*/ DEPTHS FROM THE SONAR DESCRIPTION TABLE. THIS IDENT ALSO CREATES
*/ A LIST OF ANY ACTIVE SONOBUOY CODES WHOSE ACTUAL DEPTHS EXCEED THE
*/ BOTTOM DEPTH.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*/ USFR#12, SLARAYU02, STARAYU02, LINEU#04, TITLEU#04, UNSORTU05 IN USE#1
*/ SLARAYP02, STARAYP02, POSTSRT09, TITLEP#04, LINEP#04, UNSORTP05 IN
*/ POSTSRT#1, MSGTIT06, SOUTDAT2, SSONTA03, SHARHLK11, SHARP3#24,
*/ ENVIN#29, MSGLINE17, MSGPRT#22, RANGER320, TITLINE07,
*/ LINE3#03, NM2#25, SONIN#11, TITLE3#05, SETDIP#09, SNOYSOP07,
*/ SNOYSVD11, VDSLVL#06, CONVERT00 IN SHARP3,
*/
*/ STDEPTH16.1
C ***** LATEST CHANGE - 01 OCT 82
*/ STDEPTH.66
NM0GTH = 0
*/ STDEPTH15.11.12
C
C CODESON CONTAINS THE ACTUAL CODES THAT INCLUDE MAX TOW
C DEPTH VALUES FOR SERIES BETWEEN 10000. AND 16000.
C FOR THESE CASES, EXTRACT THE SERIES FROM THE CODE.
C
*/ STDEPTH15.15
IF ( (CODESON(I) .GT. 6.) .AND. (CODESON(I) .LT. 20000. ) )
*/ STDEPTH15.17
IF (CODESON(I) .GE. 20000.) USESON = CODESON(I)
*/ STDEPTH15.20
GO TO (400, 500, 525, 550, 575, 600, 620, 630, 640, 650) J
*/ STDEPTH.100
C
C 620 CONTINUE
C
C CODED SONAR DEPTH IS FOR ANY SHALLOW SONOBUOY
C SET DEPTH = 60 FT IN KM
C

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ZSON(11) = 0.0147  
 ZASHS = 0.0147  
 GO TO 400

C  
 610 CONTINUE

C  
 C  
 C CODED SONAR DEPTH IS FOR Q62, INTERMEDIATE  
 SET DEPTH = 450 FT IN KM

C  
 ZSON(11) = 0.1372  
 ZQ62I = 0.1372  
 GO TO 800

C  
 640 CONTINUE

C  
 C  
 C CODED SONAR DEPTH IS FOR Q47, DEEP  
 SET DEPTH = 800 FT IN KM

C  
 ZSON(11) = 0.2438  
 ZQ47D = 0.2438  
 GO TO 800

C  
 650 CONTINUE

C  
 C  
 C CODED SONAR DEPTH IS FOR Q50 AND Q62, DEEP  
 SET DEPTH = 1500 FT IN KM

C  
 ZSON(11) = 0.4572  
 ZAS8D = 0.4572  
 GO TO 800

C  
 01 STDEPTH.111

C  
 C  
 C IF CURRENT SONAR DEPTH IS AN ACTIVE SONOBUOY THAT IS BELOW  
 THE BOTTOM, CAPTURE THE CODE SO THAT PROCESSING THIS  
 SONAR DEPTH CAN BE SKIPPED.

C  
 IF ( (CODESON(11) .LT. ZSONCOD(7) ) .OR.  
 (CODESON(11) .GT. ZSONCOD(10) ) ) GO TO 850  
 IF (ZSON(11) .LT. ZBOT) GO TO 850  
 NMDGTB = NMDGTB + 1  
 MDGTBD(NMDGTB) = CODESON(11)  
 IZSON(11) = 0  
 CSN(11) = 0.0  
 QSON(11) = 0.0  
 GO TO 900

C  
 050 CONTINUE

01 STDEPTH.102

C  
 C  
 C IF CURRENT SONAR DEPTH IS AN ACTIVE SONOBUOY THAT IS BELOW  
 THE BOTTOM, SKIP VELCOMP.

C  
 IF (NMDGTB .EQ. 0) GO TO 1014  
 DO 1012 J = 1, NMDGTB  
 IF (CODESON(11) .EQ. MDGTBD(J) ) GO TO 1020

1012 CONTINUE

C  
 1014 CONTINUE

C  
 0C STDEPTH

01D RANGER120

01

01 PROGRAMMEN - R. MULT (OCEAN DATA SYSTEMS, INC.)

01 DATE - 01 OCT 82

01

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// THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
// PREDICTIONS FOR ACTIVE SONOBUOYS.
// IN RANGER320 TESTS FOR SONOBUOY DEPTHS THAT EXCEED THE BOTTOM.
// IF SUCH A CASE IS FOUND, ALL PROCESSING IS SKIPPED FOR THAT BUOY
// DEPTH. THIS IDENT ALSO TREATS AS NOISE LIMITED ALL SONAR DESCRIPTION
// TABLE LINES THAT HAVE A REVERBERATION RECOGNITION DIFFERENTIAL OF
// -99. DB, AND IMPLEMENTS A NEW TEST TO ASSURE THE PROPER REVERBERATION
// TABLE IS CORE RESIDENT. THIS TEST WAS NECESSITATED BY REVISIONS IN
// THE SONAR TABLE STRUCTURE WHERE NOT ALL ACTIVE LINES HAVE ASSOCIATED
// REVERBERATION LINES.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
// USFR*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
// SLARAYP02, STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
// POSTSORT1 MSGTIT06, SOUTDAT2, SSONTAB03, SHARULK11, SHARP3*24,
// ENVIN*29, MSGLINE17, MSGPRT*22, STDEPTH17, TITLINE07,
// LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOVSOP07,
// SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3.
//
// RANGER319.]
C ***** LATEST CHANGE - 01 OCT 82
// RANGER3.56
C LOGICAL NOYSLIM
// RANGER316.5
C DO 10 I = 1,250
// RANGER3.68
C
C INITIALIZE THE NUMBER FOR THE PREVIOUS REVERB TABLE
C READ FROM EXTENDED CORE.
C
C LASTRB = 1000.
C
// RANGER304.5
C
C IF THIS LINE IS FOR AN ACTIVE SONOBUOY WHOSE DEPTH EXCEEDS
C THE BOTTOM, SKIP ALL PROCESSING.
C
C IF (NMDBTB(EQ. 0) GO TO 18
C DO 12 J = 1,NMDBTB
C IF (ZSONTB(I) .EQ. HDBTBD(J) ) GO TO 2000
C 12 CONTINUE
C
C 15 CONTINUE
// RANGER3.75
C
C IF THE RECOGNITION DIFFERENTIAL FOR REVERB IS -99. IT IS
C REALLY A FLAG INDICATING THIS RANGE SHOULD ALWAYS BE
C CONSIDERED NOISE LIMITED AND ALL REVERBERATION
C CONSIDERATIONS MUST BE SKIPPED.
C
C NOYSLIM = .FALSE.
C IF (RDNRBT(I) .LT. 0.126E-09) NOYSLIM = .TRUE.
// RANGER3.100
C THE IMPLEMENTATION OF THE NOISE LIMITED CASES HAD CREATED
C SITUATIONS WHERE NOCHG MAY INDICATE THAT THE DESIRED
C REVERB IS IN CORE, BUT ACTUALLY IT IS NOT.
C USE LASTRB TO ASSURE WE HAVE THE PROPER REVERB TABLE.
C
C IF (LASTRB .EQ. NORVBT(I) ) GO TO 45
C
C A REVERB RECOGNITION DIFFERENTIAL OF -99. INDICATES A
C NOISE LIMITED CASE. THERE IS NO ACTUAL ASSOCIATED REVERB
C TABLE.
C
C IF (NOYSLIM) GO TO 45

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C      IF THE PREDICTION TYPE FOR THE ITH LINE IS IN THE RANGE OF
C      100 TO 199 (DIRECT, CONVERGENCE ZONE, OR BOTTOM BOUNCE)
C      RETRIEVE THE TIME AND POWER ARRAYS FOR REVERBERATION
C      DATA FROM ECS.
C      IF ( (PTYPEB(I) .LT. 100) .OR. (PTYPEB(I) .GT. 199) ) GO TO 45
C
C      CALL RETREVE(NORVBTB(I), ECSRTM, TIMREV, NORVB)
C      CALL RETREVE(NORVBTB(I), ECSRTOT, REVOT, NORVB)
C      LASTB = NORVBTB(I)
C
C      45 CONTINUE
C      *D RANGER3.119,126
C      *I RANGER3.204
C      IF (NOVSLIM) GO TO 410
C      *I RANGER3.211
C      410 CONTINUE
C      *I RANGER301,3
C
C      FOR NOISE LIMITED CASES, FOM RANGE = DETECTION RANGE.
C
C      IF (NOVSLIM) GO TO 142
C      *I RANGER3.243
C
C      142 CONTINUE
C      IF (SSW(14) ) PRINT 9045, DRANGE(NOOTTB(I)), RDNRTB(I)
C      9045 FORMAT( DETECTION RANGE = FOM RANGE = %E12.6,
C      )
C      * REVERB RECOGNITION DIFFERENTIAL = %E12.6)
C      GO TO 2000
C      *C RANGER3
C      *ID MSGPRT*22
C      /
C      / PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
C      / DATE - 01 OCT 82
C      /
C      / THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
C      / PREDICTIONS FOR ACTIVE SONOBUOYS.
C      / ID MSGPRT*22 PREPARES AN ARRAY OF PULSE LENGTHS THAT ARE WRITTEN
C      / AS PART OF THE TITLE LINE BY SUBROUTINE TITLINE FOR AN ACTIVE
C      / SONOBUOY.
C      /
C      / THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
C      / USER*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
C      / SLARAYP02, STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
C      / POSTSRT1, SWSRTT06, SOUTDAT2, SSONTARD3, SHARKLK11, SHARP3*24,
C      / ENVIN*29, MSGLTNE17, RANGER320, STDEPTH17, TITLINE07.
C      / LIN.3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
C      / SNOYSDV11, VDSLVL*06, CONVERT08 IN SHARP3.
C      /
C      *D MSGPRT*21.1
C      ***** LATEST CHANGE - 01 OCT 82
C      *D MSGPRT.32
C      DIMENSION TITSIG(15)
C      *D MSGPRT*17.4
C      DO 10 I = 1,250
C      *I MSGPRT.95
C
C      TITLE LINES OF TYPE 10 REQUIRE A PULSE LENGTH, AND TYPE 12
C      REQUIRES 4 PULSE LENGTHS. EXTRACT PULENTB VALUES FROM THE
C      SONAR DESCRIPTION TABLE (SDT) AND STORE THEM IN ARRAY
C      PLSTIT FOR USE BY SUBROUTINE TITLINE.
C      THE SDT LINES CONTAINING THE RELEVANT PULSE LENGTHS CAN
C      BE IDENTIFIED FROM THE NOOUTTB ARRAY. THE FIRST PULSE
C      LENGTH IN A TITLE LINE CORRESPONDS TO THE FIRST RANGE ON
C      THE FIRST CORRESPONDING MESSAGE LINE (ARRAY KLOW) AND

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C          SUBSEQUENT PULSE LENGTHS CORRESPOND TO EVERY OTHER RANGE ON
C          THAT LINE.
C
C          IF ( (NOTFRMT(J) .NE. 10) .AND. (NOTFRMT(J) .NE. 12) ) GO TO 170
C
C          LOCATE = KLOW(I)
C          NPULS = 1
C          IF (NOTFRMT(J) .EQ. 12) NPULS = 4
C          DO 160 IX = 1, NPULS
C            DO 160 IXX = 1, NUP
C              ILINE = IXX
C              IF (MODUTB(IXX) .EQ. LOCATE) GO TO 170
C          160 CONTINUE
C
C          170 CONTINUE
C          PLSTIT(IX) = PULENTB(ILINE)
C          LOCATE = LOCATE + 2
C          180 CONTINUE
C
C          190 CONTINUE
C          *C MSGPRT
C          *ID MSGLINE17
C          *
C          *// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
C          *// DATE - 01 OCT 82
C          *
C          *// THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
C          *// PREDICTIONS FOR ACTIVE SONOBUOYS.
C          *// ID MSGLINE17 PRINTS THE MESSAGE LINES FOR ACTIVE SONOBUOYS.
C          *// IF A SONOBUOY DEPTH EXCEEDS THE BOTTOM DEPTH, THE LINE IS SKIPPED
C          *// AND A COMMENT IS ENTERED IN THE DAYFILE.
C          *
C          *// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
C          *// USER*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER
C          *// SLARAYP02, STARAYP02, POSTSR09, TITLEP*04, LINEP*04, UNSORTP05 IN
C          *// POSTSR01 MSGGTIT06, SOUTDAT2, SONTAB03, SHARBLK11, SHARP3*24,
C          *// ENVIN*29, MSGPRT*22, RANRER320, STDEPTH17, TITLINE07,
C          *// LINE3*03, NM2*25, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
C          *// SNOYSDV11, VDSLVL*06, CONVERT08 IN SHARP3,
C          *
C          *D MSGLINE16.1
C          ***** LATEST CHANGE - 01 OCT 82
C          *I MSGLINE.23
C          DIMENSION MDRMK(15)
C          *I MSGLINE.24
C          DATA MDRMK / 10M , 10MFT, DPT 0T, 10M BOT, NO M,
C          1 , 10M56 LINE. , 0000 0000 0000 0000 0000 /
C
C          *I MSGLINE03.1
C          IF (INOMFRMT (I) .EQ. 11) GO TO 700
C          IF (INOMFRMT (I) .EQ. 13) GO TO 800
C          *I MSGLINE.141
C
C          700 CONTINUE
C
C          FORMAT TYPE 11 - PERFORM THE NECESSARY CONVERSIONS AND
C          THEN WRITE THE MESSAGE LINE.
C
C          DETERMINE HYDROPHONE DEPTH ASSOCIATED WITH THIS LINE.
C
C          LOCATE = KLOW(I)
C          DO 750 IMAIN = 1, NUP
C            IF (MODUTB(IMAIN) .NE. LOCATE) GO TO 750
C            ZSUSE = 7ASUS
C            IF (ZSONTR(IMAIN) .GT. +0000.) ZSUSE = 70470

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```

C      IF THE SONOBUOY DEPTH EXCEEDS THE BOTTOM, SKIP THE LINE AND
C      ENTER A MESSAGE IN THE DAYFILE.
C
      IF (NMDSGTB .EQ. 0) GO TO 760
      DO 720 J = 1, NMDSGTB
      IF (ZSONTB(I,MAIN) .EQ. MDGTBD(J) ) GO TO 900
720  CONTINUE
C
      GO TO 760
750  CONTINUE
C
760  CONTINUE
C
      IZMD = IFIX( (ZSUSE * FTPERKM / 10.0) * 0.5)
      CALL CONVERT(KLOW(I), KLOW(I) * 1, 2)
      CALL CONVERT(KLOW(I) * 2, KHIGH(I), 1)
      KLO = KLOW(I)
      KHI = KHIGH(I)
C
      WRITE(IOUT,9011) LNMODE(I), IZMD, (IROUT(K), K=KLO, KHI)
9011 FORMAT(2X,A4,I3,4X,A3,1H/,A3,26X,I4,1H/,I4)
      RETURN
C
800  CONTINUE
C
      FORMAT TYPE 13 - PERFORM THE NECESSARY CONVERSIONS AND
      THEN WRITE THE MESSAGE LINE.
C
      DETERMINE HYDROPHONE DEPTH ASSOCIATED WITH THIS LINE.
C
      LOCATE = KLOW(I)
      DO 850 IMAIN = 1, NUP
      IF (MDOUTTB(IMAIN) .NE. LOCATE) GO TO 850
      ZSUSE = ZASUS
      IF (ZSONTB(IMAIN) .GE. 41000.) ZSUSE = 20621
      IF (ZSONTB(IMAIN) .GE. 43000.) ZSUSE = ZASBO
C
      IF THE SONOBUOY DEPTH EXCEEDS THE BOTTOM, SKIP THE LINE AND
      ENTER A MESSAGE IN THE DAYFILE.
C
      IF (NMDSGTB .EQ. 0) GO TO 860
      DO 820 J = 1, NMDSGTB
      IF (ZSONTB(I,MAIN) .EQ. MDGTBD(J) ) GO TO 900
820  CONTINUE
C
      GO TO 860
850  CONTINUE
C
860  CONTINUE
C
      IZMD = IFIX( (ZSUSE * FTPERKM / 10.0) * 0.5)
      CALL CONVERT(KLOW(I), KLOW(I) * 7, 2)
      CALL CONVERT(KLOW(I) * 8, KHIGH(I), 1)
      KLO = KLOW(I)
      KHI = KHIGH(I)
      WRITE(IOUT,9013) LNMODE(I), IZMD, (IROUT(K), K=KLO, KHI)
9013 FORMAT(2X,A4,I3,4X,3(A3,1H/,A3,1X),1X,A3,1H/,A3,1X,I4,1H/,I4)
      RETURN
900  CONTINUE
C
      THE CURRENT MESSAGE LINE WILL NOT BE PRINTED BECAUSE
      THE SONOBUOY DEPTH EXCEEDS THE BOTTOM. ALL RELATED
      PROCESSING FOR THIS LINE HAS BEEN BY-PASSED IN SHARP3
      AND RANGER.

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```

C
C      PREPARE MESSAGE AND ENTER IN THE DAYFILE.
C
      SONAR = SONTYP (ICODE(1MAIN) )
      DEPTH = 7SUSE * F1PERKM
      ENCODE(10, 910, HORMK1(1)) SONAR, DEPTH
      910 FORMAT(A3, 2X, F5.0)
      CALL REMARK (HORMK1)
      RETURN
C MSGLINE
C ID TITLINE07
C
C / PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
C / DATE - 01 OCT 82
C
C / THE PURPOSE OF THIS UPDATE IS TO ALLOW SHARPS TO PERFORM
C / PREDICTIONS FOR ACTIVE SONOBUOYS.
C / IN TITLINE07 WRITES TITLE LINES TYPE 10 AND 12 WHICH ACCOMPANY
C / ACTIVE SONOBUOY PREDICTIONS. THESE TITLE LINES ALSO INCLUDE PULSE
C / LENGTHS TAKEN FROM AN ARRAY PREPARED IN MSGPRT.
C
C / THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTSI
C / USFR012, STARAYU02, STARAYU02, LINEU04, TITLEU04, UNSORTU05 IN USER1
C / STARAYP02, STARAYP02, POSTSRT09, TITLEP04, LINEP04, UNSORTP05 IN
C / POSTSRT1, MSGTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3024,
C / ENVIN029, MSGLINE17, MSGPRT022, RANGERS320, STDEPTH17,
C / LINE303, NM2025, SONIN011, TITLE305, SETDIP09, SNUYSDP07,
C / SNOYSVD11, VDSLVL06, CONVERT08 IN SHARP3.
C
C ID TITLINE06.1
C ***** LATEST CHANGE - 01 OCT 82
C I TITLINE.12
      DIMENSION ICHARP(4)
C
C      ICHARP CONTAINS PULSE LENGTHS FOR TITLE LINES IN
C      CHARACTER FORMAT WITH LEADING ZEROS IF THE PULSE LENGTH IS
C      LESS THAN 1. SEC.
C
C I TITLINE.16
      DATA IZCHAR / 0000 0000 0000 0000 00338 /
C
C I TITLINE.29
      IF (NOTFRMT(J) .EQ. 10) GO TO 400
      IF (NOTFRMT(J) .EQ. 12) GO TO 500
C I TITLINE.02
C
C 400 CONTINUE
C      PREPARE PULSE LENGTH CHARACTER STRING WITH LEADING ZERO
C      IF NEEDED.
C
      ENCODE(3,410,ICHARP(1) ) PLSTIT(1)
      410 FORMAT(F3.1)
      IF (PLSTIT(1) .LT. 1.0) CALL STOCH(ICHARP(1),1,IZCHAR)
C
C      WRITE THE TITLE LINE USING FORMAT TYPE 10.
C      THIS FORMAT INCLUDES ONE PULSE LENGTH THAT MUST BE INSERTED
C      IN ARRAY PLSTIT BY SUBROUTINE MSGPRT.
C
      WRITE(1OUT,4010) SONTYP(J),ICHARP(1)
      4010 FORMAT(1X, A4, '---MD---CW---', A3, 29(1H-), 'COC/COM--')
C
      RETURN
C
C 500 CONTINUE
C
C      PREPARE PULSE LENGTH CHARACTER STRING WITH LEADING ZEROS

```



```

*/ SLARAYP02, STARAYP02, POSTSRT09, TITLEP04, LINEP04, UNSORTP05 IN
*/ POSTSRT09, MSGTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3*24,
*/ ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPTH17, TITLINE07,
*/ LINE3*03, SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
*/ SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3,
*/
*/ NM2*24.1
C ***** LATEST CHANGE 01OCT82
*/ NM2*01.421
PRINT 9240
*/ NM2
*/ ID SONIN*11
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS IDENT IS TO CAUSE RECOMPILATION OF THIS
*/ SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
*/ SURROUTINE.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*/ USFR*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
*/ SLARAYP02, STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
*/ POSTSRT09, MSGTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3*24,
*/ ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPTH17, TITLINE07,
*/ LINE3*03, NM2*25, TITLE3*05, SETDIP*09, SNOYSDP07,
*/ SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3,
*/
*/ SONIN*10.1
C ***** LATEST CHANGE 01OCT82
*/ SONIN
*/ ID TITLE3*05
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS IDENT IS TO CAUSE RECOMPILATION OF THIS
*/ SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
*/ SURROUTINE.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*/ USFR*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
*/ SLARAYP02, STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
*/ POSTSRT09, MSGTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3*24,
*/ ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPTH17, TITLINE07,
*/ LINE3*03, NM2*25, SONIN*11, SETDIP*09, SNOYSDP07,
*/ SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3,
*/
*/ TITLE3*01.4
C ***** LATEST CHANGE 01OCT82
*/ TITLE3
*/ ID SETDIP*09
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS IDENT IS TO CAUSE RECOMPILATION OF THIS
*/ SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
*/ SURROUTINE.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS:
*/ USFR*12, SLARAYU02, STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
*/ SLARAYP02, STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
*/ POSTSRT09, MSGTIT06, SOUTDAT2, SSONTAB03, SHARBLK11, SHARP3*24,
*/ ENVIN*29, MSGLINE17, MSGPRT*22, RANGER320, STDEPTH17, TITLINE07,
*/ LINE3*03, NM2*25, SONIN*11, TITLE3*05, SNOYSDP07,

```

```

// SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3.
//
//D SFTDIP*04.1
C ***** LATEST CHANGE 01OCT82
//C SFTDIP
//ID SNOYSDP07
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS IDENT IS TO CAUSE RECOMPILATION OF THIS
// SURROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SURROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTs:
// USFR*12, $LARAYU02, $STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
// $LARAYP02, $STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
// POSTSORT1, $MSGTIT06, $OUTDAT2, $SONTAB03, $SHARBLK11, $SHARP3*24,
// ENVIN*29, $MSGLINE17, $MSGPRT*22, $RANGER320, $STDEPTM17, $TITLINE07,
// LINE3*03, NM2*25, $SONIN*11, TITLE3*05, SETDIP*09,
// SNOYSVD11, VDSLVL*06, CONVERT08 IN SHARP3.
//
//D SNOYSDP06.1
C ***** LATEST CHANGE 01OCT82
//C SNOYSDP
//ID SNOYSVD11
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS IDENT IS TO CAUSE RECOMPILATION OF THIS
// SURROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SURROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTs:
// USFR*12, $LARAYU02, $STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
// $LARAYP02, $STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
// POSTSORT1, $MSGTIT06, $OUTDAT2, $SONTAB03, $SHARBLK11, $SHARP3*24,
// ENVIN*29, $MSGLINE17, $MSGPRT*22, $RANGER320, $STDEPTM17, $TITLINE07,
// LINE3*03, NM2*25, $SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
// VDSLVL*06, CONVERT08 IN SHARP3.
//
//D SNOYSVD10.1
C ***** LATEST CHANGE 01OCT82
//C SNOYSVD
//ID VDSLVL*06
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS IDENT IS TO CAUSE RECOMPILATION OF THIS
// SURROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SURROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTs:
// USFR*12, $LARAYU02, $STARAYU02, LINEU*04, TITLEU*04, UNSORTU05 IN USER1
// $LARAYP02, $STARAYP02, POSTSRT09, TITLEP*04, LINEP*04, UNSORTP05 IN
// POSTSORT1, $MSGTIT06, $OUTDAT2, $SONTAB03, $SHARBLK11, $SHARP3*24,
// ENVIN*29, $MSGLINE17, $MSGPRT*22, $RANGER320, $STDEPTM17, $TITLINE07,
// LINE3*03, NM2*25, $SONIN*11, TITLE3*05, SETDIP*09, SNOYSDP07,
// SNOYSVD11, CONVERT08 IN SHARP3.
//
//D VDSLVL*05.1
C ***** LATEST CHANGE 01OCT82
//C VDSLVL

```

APPENDIX H  
SAMPLE SHARPS 18.8 OUTPUT

SHARPS III PREDICTION BASED ON 10 10Z SEP 82 DATA

01SP/FOTS 81032700Z M0/ 17.5/1513/ 32/ 17.5/1514, 34/ 17.5/1514  
 90/ 16.0/1510, 140/ 13.9/1504, 180/ 12.2/1499, 200/ 11.5/1497  
 240/ 10.4/1494, 300/ 9.0/1491, 400/ 7.9/1488, 500/ 7.0/1487  
 800/ 5.2/1484, 1200/ 3.9/1486, 2000/ 2.4/1493, 2200/ 2.2/1496  
 3000/ 2.0/1509, 4000/ 1.9/1526, 4206/ 1.9/1529  
 NPX(3260/ 943)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(4206)SLD( 34)  
 NP TGT 95 AVG SVL 1501 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
 6 7/ 20 81/ 81  
 80 1/ 18 49/ 49  
 SBR --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 75/ 46 59/ 43 23/ 35 11/ 31 459/ 630  
 150 55/ 56 51/ 55 44/ 48 1/ 37 418/ 418  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 78/ 47 75/ 46 23/ 39 12/ 33 459/ 630  
 150 57/ 58 55/ 56 47/ 53 37/ 44 418/ 418

05FA/FOTS 81032700Z M0/ 20.7/1523/ 81/ 18.5/1518, 101/ 17.6/1516  
 121/ 17.0/1514, 140/ 16.0/1512, 160/ 14.9/1509, 199/ 13.5/1505  
 300/ 11.3/1499, 400/ 9.5/1494, 600/ 5.6/1482, 650/ 5.2/1481  
 700/ 4.8/1481, 800/ 4.1/1479, 1400/ 2.6/1484, 1800/ 2.1/1489  
 2100/ 2.0/1493, 2600/ 1.8/1501, 3000/ 1.5/1507, 5121/ 1.5/1544  
 NPX(3937/ 1183)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(5121)SLD( 0)  
 NP TGT 61 AVG SVL 1506 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
 6 22/ 22 33/ 33  
 80 1/ 1 62/ 62  
 SBR --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 34/ 34 34/ 34 34/ 34 33/ 32 384/ 675  
 150 63/ 63 58/ 56 46/ 46 1/ 1 153/ 610  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 34/ 34 34/ 34 34/ 34 34/ 34 384/ 675  
 150 65/ 66 63/ 63 53/ 52 1/ 1 153/ 610

08SP/FOTS 81032700Z M0/ 19.2/1519/ 17/ 19.2/1520, 18/ 19.2/1520  
 40/ 18.2/1517, 60/ 17.5/1515, 89/ 17.0/1514, 120/ 17.0/1515  
 150/ 16.8/1515, 191/ 16.4/1514, 300/ 15.6/1514, 400/ 14.1/1510  
 510/ 12.0/1505, 600/ 9.1/1496, 700/ 6.6/1488, 800/ 5.0/1483  
 900/ 4.4/1482, 1200/ 3.2/1483, 1600/ 2.5/1487, 1900/ 2.1/1490  
 2400/ 1.8/1497, 3475/ 1.6/1515, 4000/ 1.6/1524, 6000/ 1.6/1561  
 6949/ 1.6/1578  
 NPX(3675/ 3273)GR( 2.0)BL(1/1)WH( 1)WS(12)BD(6949)SLD( 18)  
 NP TGT 79 AVG SVL 1523 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
 6 1/ 22 32/ 32  
 80 1/ 1 49/ 49  
 SBR --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 34/ 33 34/ 31 31/ 23 10/ 1 192/ 657  
 150 68/100 67/ 94 66/ 56 1/ 1 157/ 607  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 34/ 34 34/ 33 33/ 25 30/ 1 192/ 657  
 150 68/103 68/100 67/ 82 63/ 94 157/ 607

09SM/FOTS 81032700Z M0/ 18.0/1515/ 19/ 18.0/1515, 20/ 18.0/1515  
 40/ 12.8/1499, 60/ 9.4/1488, 80/ 7.1/1480, 120/ 4.3/1469  
 170/ 2.8/1463, 220/ 1.9/1460, 300/ .8/1457, 400/ .4/1457  
 500/ .3/1458, 600/ .2/1459, 700/ .2/1461, 2195/ .1/1485  
 DPX(3942/-1748)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2195)SLD( 20)  
 DP TGT 81 AVG SVL 1470 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
 6 6/ 1 77/ 77  
 80 1/ 22 32/ 32  
 SBR --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 67/ 32 52/ 28 25/ 23 11/ 1 491/ 491  
 150 33/ 34 31/ 34 27/ 34 20/ 27 384/ 384  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 73/ 34 67/ 32 34/ 26 46/ 1 491/ 491  
 150 34/ 34 33/ 34 28/ 34 22/ 32 384/ 384

58F4/FOTS 81032700Z M0/ 10.4/1492/ 28/ 10.4/1492, 29/ 10.4/1492  
 60/ 8.9/1487, 80/ 8.8/1487, 182/ 8.8/1489  
 DPX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 29)  
 DP TGT 90 AVG SVL 1488 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
 6 1/ 1 82/ 82  
 SBR --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 84/ 56 79/ 53 68/ 48 9/ 1 204/ 204  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 86/ 57 84/ 56 74/ 50 77/ 1 204/ 204

58W1/FOTS 81032700Z M0/ 5.5/1473/ 19/ 5.5/1473, 20/ 5.5/1473  
 40/ 5.8/1475, 60/ 5.6/1474, 182/ 5.6/1477  
 DPX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 40)  
 DP TGT 101 AVG SVL 1475 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
 6 1/ 1 64/ 64  
 SBR --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 65/ 58 58/ 55 47/ 45 8/ 1 194/ 194  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0-----CDC/CDM-  
 6 67/ 60 65/ 58 53/ 50 11/ 1 194/ 194

40SP/FOTS 81032700Z M0/ 17.8/1519/ 19/ 17.8/1519, 20/ 17.8/1519  
 60/ 14.9/1511, 100/ 13.8/1508, 120/ 13.5/1508, 150/ 13.5/1508  
 300/ 13.8/1513, 400/ 13.7/1514, 500/ 13.7/1516, 560/ 13.6/1516  
 600/ 13.5/1517, 900/ 13.0/1520, 1100/ 13.0/1523, 2700/ 13.0/1550  
 DRX( 0/ 0)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(2700)SLD( 20)  
 DP TGT 81 AVG SVL 1528 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
     6      1/ 1                      61/ 61  
     80      1/ 1                      45/ 45  
 SRR --HD--CW--1.0-----0.5-----0.1--FM--1.0---CDC/CDM-  
     6      61/ 27 55/ 23 42/ 18      1/ 1 338/ 453  
     150     56/112 56/104 56/ 83     51/ 89 322/ 443  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0---CDC/CDM-  
     6      65/ 28 61/ 27 49/ 21      7/ 1 338/ 453  
     150     56/120 56/112 56/ 91     55/104 322/ 443

02HC/FOTS 81032700Z M0/ 20.7/1523/ 2700/ 13.0/1550,\*\*\*\*/ 0.0/\*\*\*\*  
 DRX(MA HALF CH)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2700)SLD(2700)  
 DP TGT 305 AVG SVL 1527 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
     6      30/ 15                      114/ 114  
     80      1/ 1                      132/ 132  
 SRR --HD--CW--1.0-----0.5-----0.1--FM--1.0---CDC/CDM-  
     6      131/118 123/106 101/ 80    105/ 65 313/ 313  
     150     121/133 109/116 82/ 85     1/ 21 521/ 521  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0---CDC/CDM-  
     6      134/126 131/118 111/ 90    123/105 313/ 313  
     150     130/143 121/132 93/ 98     89/100 521/ 521

02NG/FOTS 81032700Z M0/ 20.7/1523/ 400/ 16.7/1516,\*\*\*\*/ 0.0/\*\*\*\*  
 DRX(MA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 400)SLD( 0)  
 DP TGT 61 AVG SVL 1519 POD 50.

SBA --HD--CW--0.1-----CDC/CDM-  
     6      1/ 1                      191/ 191  
     80      1/ 1                      111/ 111  
 SRR --HD--CW--1.0-----0.5-----0.1--FM--1.0---CDC/CDM-  
     6      191/150 190/101 182/ 58    185/ 1 718/ 718  
 SRC --HD--CW--1.0-----0.5-----0.1--FM--1.0---CDC/CDM-  
     6      193/159 191/150 187/ 79    190/ 1 718/ 718

APPENDIX I  
UPDATE CARD IMAGES FOR USER 17.9, POSTSORT 17.9,  
AND SHARPS 18.9  
(SELF-NOISE)

```

*ID SNOYSU*02
*YANK SNOYSU*01
*ID USER*13
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
*/ SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
*/ TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
*/ SELF-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
*/ NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
*/ AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
*/ IN USER - SNOYSU*02
*/ IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
*/ IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSOP08,
*/ SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
*/ RANGER32, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
*/
*YANK USER*10
*ID USER*11.3
C ***** LATEST CHANGE - 01 OCT 82
*ID USER,390
IF (SSNOYS(M,N) + 50.0 .LT. SNOYS(M,N-1))
*ID USER,784
*ID USER*11.60
PRINT 0210,IP,PSPEED(J), (SSNOYS(K1,J),K1=1,5),
*ID USER

```

```

*ID SNOYSP*02
*YANK SNOYSP*01
*ID POSTSRT10
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
*/ SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
*/ TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
*/ SFLP-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
*/ NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
*/ AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
*/ IN USER - SNOYSU*02,USER*13
*/ IN POSTSORT- SNOYSP*02, NOISEP*04
*/ IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLPNOYS09, SNOYSDP08,
*/ SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
*/ RANGER321, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
*/
*YANK POSTSRT07
*ID POSTSRT08.3
C ***** LATEST CHANGE - 01 OCT 82
*OC POSTSRT
*ID NOISEP*04
*/
*/ PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
*/ SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
*/ TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
*/ SFLP-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
*/ NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
*/ AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
*/ IN USER - SNOYSU*02,USER*13
*/ IN POSTSORT- SNOYSP*02, POSTSRT10
*/ IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLPNOYS09, SNOYSDP08,
*/ SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
*/ RANGER321, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
*/
*ID NOISEP*03.1
C ***** LATEST CHANGE - 01 OCT 82
*YANK NOISEP*03
*OC NOISEP

```

```

*ID $SONDE504
*ID $SONDE507.7
      7      NOYSUP, PSPEED(150), SSNOYS(5,150)
*YANK $SONDE504
*ID $SONDE505.7
*ID ENVIN*30
*/
*/ PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
*/ SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
*/ TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
*/ SELF-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
*/ NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
*/ AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
*/ IN USEP - $NOYSU*02, USER*13
*/ IN POSTSORT- $NOYSP*02, POSTSRT10, NOISEP*04
*/ IN SHARPS- $SONDE508, NOISE3*07, SLFNOYS09, SNOYSDP08,
*/ SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
*/ RANGER321, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
*/
*ID ENVIN*28.1
C ***** LATEST CHANGE - 01 OCT 82
*ID ENVIN*23.21.29
*ID ENVIN*23.30.46
C
C *****
C
C SEA STATE IS CURRENTLY LIMITED TO A MAXIMUM OF 5.
C
C *****
C
      IF (SEASTA .GT. 5) SEASTA = 5
*ID ENVIN
*ID NOISE3*07
*/
*/ PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
*/ SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
*/ TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
*/ SELF-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
*/ NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
*/ AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
*/
*/ THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
*/ IN USEP - $NOYSU*02, USER*13
*/ IN POSTSORT- $NOYSP*02, POSTSRT10, NOISEP*04
*/ IN SHARPS- $SONDE508, ENVIN*30, SLFNOYS09, SNOYSDP08,
*/ SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
*/ RANGER321, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
*/
*ID NOISE3*04.1
C ***** LATEST CHANGE - 01 OCT 82
*YANK NOISE3*05
*ID NOISE3
*ID SLFNOYS09
*/
*/ PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)

```

```

// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
// SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
// TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
// SELF-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
// NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
// AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU02,USER013
// IN POSTSORT- SNOYSP02, POSTSRT10, NOISEP04
// IN SHARPS- SSONDES08, ENVIN030, NOISE307, SNOYSOP08,
// SONIN012, SHARP3025, MSGLINE18, MSGPRT023, NM2026,
// RANGER321, SEXY07, SNOYSVD12, UNSORT307, VDSLVL07
//
//D SLFNOYS08.1
// ***** LATEST CHANGE - 01 OCT 82
//I SLFNOYS.14
// DIMENSION WINDS(6)
//I SLFNOYS.16
// DATA (WINDS(I),I=1,6) / 5.0, 9.0, 13.0, 18.0, 23.0, 28.0 /
//
//C
//C WINDS HOLDS THE WIND SPEEDS (KNOTS) CORRESPONDING TO SEA
//C STATES ONE THROUGH SIX.
//C
//I SLFNOYS.26
//C
//C DETERMINE RELEVANT SEA STATE INDEXES (ISS AND K).
//C
//C W50 = AMAX1(WINDSP, 5.0)
//C DO 20 IX = 2,5
//C ISS = IX
//C IF (W50 .LE. WINDS(IX) ) GO TO 40
//C 20 CONTINUE
//C
//C 40 CONTINUE
//C
//C K = ISS - 1
//C
//C DETERMINE INTERPOLATION FACTOR.
//C
//C FRCT = (W50 - WINDS(K) ) / (WINDS(ISS) - WINDS(K) )
//D SLFNOYS03.3
//C SNOISE = EXP(E10D10 * (SSNOYS(K,J) * FRCT *
//C (SSNOYS(ISS,J) - SSNOYS(K,J) ) ) )
//D SLFNOYS03.4
//D SLFNOYS01.5,7
//C SHPNL = SSNOYS(K,J-1) * (SPEEDTB(I) - PSPEED(J-1) )
//C 1 * (SSNOYS(K,J) - SSNOYS(K,J-1) )
//C 2 / (PSPEED(J) - PSPEED(J-1) )
//C SHPMH = SSNOYS(ISS,J-1) * (SPEEDTB(I) - PSPEED(J-1) )
//C 1 * (SSNOYS(ISS,J) - SSNOYS(ISS,J-1) )
//C 2 / (PSPEED(J) - PSPEED(J-1) )
//C SNOISE = EXP(E10D10 * (SHPNL * FRCT * (SHPMH - SHPNL) ) )
//C SLFNOYS
//D SNOYSDPOR
//
// PROGRAMMER - P. HOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
// SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
// TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
// SELF-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
// NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER

```

```

// AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDFSUH, ENVIN*30, NOISE1*07, SLFNOYS09,
// SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
// RANGER321, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
//
//D SNOYSDP04.1
C ***** LATEST CHANGE - 01 OCT 82
//D SNOYSDP05.1
//YANK SNOYSDP05
//C SNOYSDP
//ID SONIN*12
//
// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO REVERT TO THE USE OF INPUTTING
// SELF-NOISE DATA FOR SEA STATES 1-5 ONLY, AND TRUNCATING SEA STATES
// TO 5 IF WAVE HEIGHTS ARE TOO HIGH. ADDITIONALLY, SHARPS WILL DERIVE
// SELF-NOISE VALUES USING WINDSPEED TO INTERPOLATE BETWEEN INPUT
// NOISE VS. SEA STATE TABLES. THIS CHANGE IS INTENDED TO GAIN BETTER
// AGREEMENT WITH FLEET GUIDANCE AND WITH SIMAS.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDFS08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
// RANGER321, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
//
//D SONIN*10.1
C ***** LATEST CHANGE - 01 OCT 82
//YANK SONIN*88
//I SONIN.47
C
C THE FOLLOWING CHECK IS TO MAKE THE CURRENT VERSION OF
C SHARPS COMPATIBLE WITH SONAR DESCRIPTION FILES THAT HAVE
C SELF-NOISE VALUES FOR 9 SEA STATES. ON THOSE FILES
C NOYSUP HAS BEEN INCREMENTED BY 10000 TO SIGNAL 9 SEA STATES.
C
C
C NSS = 5
C IF (NOYSUP .GT. 10000) NSS = 9
C IF (NOYSUP .GT. 10000) NOYSUP = NOYSUP - 10000
//D SONIN.90.91
C IF (NSS .EQ. 5) READ(10) (PSPEED(I), (SSNOYS(J,I), J=1,5),
C I=1,NOYSUP)
C
C IF THERE ARE 9 SEA STATES READ THE EXTRA VALUES INTO DUMMY.
C
C IF (NSS .EQ. 9) READ(10) (PSPEED(I), (SSNOYS(J,I), J=1,5),
C DUMMY,DUMMY,DUMMY,DUMMY), I=1,NOYSUP)
C
//C SONIN
//ID SHARP3*25
//
// PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO CAUSE RECOMPILATION OF THIS
// SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SUBROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-

```

```

// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SONIN*12, MSGLINE18, MSGPRT*23, NM2*26,
// RANGERJ21, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
//
*O SHARP3*23.1
C ***** LATEST CHANGE - 01 OCT 82
*O SHARP3
*ID MSGLINE18
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO CAUSE RECOMPILATION OF THIS
// SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SUBROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SONIN*12, SHARP3*25, MSGPRT*23, NM2*26,
// RANGERJ21, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
//
*O MSGLINE16.1
C ***** LATEST CHANGE - 01 OCT 82
*O MSGLINE
*ID MSGPRT*23
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO CAUSE RECOMPILATION OF THIS
// SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SUBROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SONIN*12, SHARP3*25, MSGLINE18, NM2*26,
// RANGERJ21, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
//
*O MSGPRT*21.1
C ***** LATEST CHANGE - 01 OCT 82
*O MSGPRT
*ID NM2*26
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO CAUSE RECOMPILATION OF THIS
// SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SUBROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23,
// RANGERJ21, SEXY*07, SNOYSVD12, UNSORT307, VDSLVL*07
//
*O NM2*24.1
C ***** LATEST CHANGE - 01 OCT 82
*O NM2

```



```

// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
// RANGER321, SEXY*07, SNOYSVD12, VDSLVL*07
//
//D UNSORT304.1
C ***** LATEST CHANGE - 01 OCT 82
//C UNSORT3
//D VDSLVL*07
//
// PROGRAMMER - R. MOLT (OCEAN DATA SYSTEMS, INC.)
// DATE - 01 OCT 82
//
// THE PURPOSE OF THIS UPDATE IS TO CAUSE RECOMPILATION OF THIS
// SUBROUTINE NECESSITATED BY CHANGES TO COMDECKS APPEARING IN THE
// SUBROUTINE.
//
// THIS UPDATE IS IMPLEMENTED IN CONJUNCTION WITH THE FOLLOWING IDENTIS-
// IN USER - SNOYSU*02,USER*13
// IN POSTSORT- SNOYSP*02, POSTSRT10, NOISEP*04
// IN SHARPS- SSONDES08, ENVIN*30, NOISE3*07, SLFNOYS09, SNOYSDP08,
// SONIN*12, SHARP3*25, MSGLINE18, MSGPRT*23, NM2*26,
// RANGER321, SEXY*07, SNOYSVD12, UNSORT307
//
//D VDSLVL*05.1
C ***** LATEST CHANGE - 01 OCT 82
//C VDSLVL

```

APPENDIX J

SAMPLE SHARPS 18.0 OUTPUT FOR SELF-NOISE UPDATES

SHARPS III PREDICTION BASED ON 08 14Z SEP 82 DATA

SNY1/FOTS R2090300Z M0/ 18.7/1519/ 20/ 18.8/1519, 800/ 5.2/1485  
 1000/ 3.7/1482, 1600/ 2.2/1486, 2000/ 2.1/1492, 5000/ 1.5/1542  
 DRX(3599/ 1399)GR( 2.0)BL(1/1)WH( 2)WS(10)BD(5000)SLD( 20)  
 DP TGT 81 AVG SVL 1507 POD 50.

|        |         |        |       |           |        |         |            |                   |
|--------|---------|--------|-------|-----------|--------|---------|------------|-------------------|
| SNA    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CDC/CDM-          |
| ALL    | 22/     | 33     |       | 22/       | 22     | 20/     | 16         | 971/1254          |
| SNR    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CZW---CDC/CDM-    |
| MD/1   | 45/     | 40     |       | 45/       | 39     | 29/     | 38         | - 1782/2509       |
| MD/2   | 23/     | 31     |       | 23/       | 31     | 23/     | 30         | 1782/2509         |
| SNC    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CZW---CDC/CDM-    |
| GND    | 69/     | 40     |       | 54/       | 39     | 39/     | 39         | 1120/2509         |
| RTD    | 99/     | 41     |       | 87/       | 41     | 77/     | 40         | - 1570/2509       |
| PSV OT | 32 -    |        |       | 32/ 45 -  |        | 45 NSY  | 89 -1881/  | 49 -1254          |
| SND    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CDC/CDM-          |
| GND    | 61/     | 40     |       | 41/       | 39     | 12/     | 38         | 958/1881          |
| RTD    | 79/     | 42     |       | 66/       | 40     | 43/     | 39         | 1120/1881         |
| SNE    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CZW---CDC/CDM-    |
| GND    | 82/     | 43     |       | 58/       | 40     | 23/     | 35         | 1887/2509         |
| RST    | 115/    | 45     |       | 92/       | 44     | 56/     | 39         | 626-636 2099/3136 |
| BB     | MIN-A/R | 25/223 |       | MAXSE-A/R | 25/244 | MAX-A/R | 25/244     |                   |
| PSV OT | 63 -    |        |       | 63/ 46 -  |        | 46 NSY  | 199 -1254/ | 49 - 688          |
| SNE    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CZW---CDC/CDM-    |
| GND    | 121/    | 45     |       | 104/      | 45     | 78/     | 42         | 1887/2509         |
| RST    | 154/    | 45     |       | 138/      | 45     | 110/    | 45         | 625-671 2099/3136 |
| BB     | MIN-A/R | 25/223 |       | MAXSE-A/R | 15/403 | MAX-A/R | 15/446     |                   |
| PSV OT | 146 -   |        |       | 672/ 49 - |        | 648 NSY | 515 -1881/ | 525 -1881         |
| SNG    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----      | CZW---CDC/CDM-    |
| GND    | 115/    | 45     |       | 112/      | 45     | 105/    | 45         | 1887/2509         |
| RST    | 150/    | 45     |       | 146/      | 45     | 139/    | 45         | 625-669 2099/3136 |
| BB     | MIN-A/R | 25/223 |       | MAXSE-A/R | 15/388 | MAX-A/R | 15/433     |                   |
| PSV OT | 137 -   |        |       | 667/ 49 - |        | 642 NSY | 324 -1881/ | 461 -1254         |
| SNH    | ---     | 12KTS  | ----- | 18KTS     | -----  | TD      | -----      | CDC/CDM-          |
| GND    | 37/     | 45     |       | 37/       | 45     | 45      |            | 811/ 811          |
| RTD    | 37/     | 45     |       | 37/       | 45     | 45      |            | 925/ 925          |
| GNDP   | 37/     | 45     |       | 37/       | 45     | 45      |            | 811/ 811          |
| RTDP   | 37/     | 45     |       | 37/       | 45     | 45      |            | 925/ 925          |
| SNT    | 20/     | 34     |       | DU        | 5      | PSV     | 1 - 1      | CDC 946 CDM 1286  |

SNY2/EOTS 82090300Z M0/ 18.7/1519/ 20/ 18.8/1519, 800/ 5.2/1485  
 1000/ 3.7/1482, 1600/ 2.2/1486, 2000/ 2.1/1492, 5000/ 1.5/1542  
 DRX(3599/ 1399)GR( 2.0)BL(1/1)WH( 3)WS(20)BD(5000)SLD( 20)  
 OP TGT 81 AVG SVL 1507 POD 50.

| SNA    | ---12KTS---         | 18KTS--- | 24KTS---            | -----CDC/CDM-     |
|--------|---------------------|----------|---------------------|-------------------|
| ALL    | 1/ 1                | 1/ 1     | 1/ 1                | 971/1254          |
| SNR    | ---12KTS---         | 18KTS--- | 24KTS---            | CZW---CDC/CDM-    |
| MD/1   | 1/ 39               | 1/ 39    | 1/ 38               | - 1676/2509       |
| MD/2   | 1/ 1                | 1/ 1     | 1/ 1                | 1676/2509         |
| SNC    | ---12KTS---         | 18KTS--- | 24KTS---            | CZW---CDC/CDM-    |
| GUD    | 53/ 40              | 44/ 39   | 12/ 39              | 975/1881          |
| BTR    | 81/ 40              | 74/ 40   | 55/ 40              | - 1358/2509       |
| PSV QT | 32 - 32/ 45 - 45    | NSY      | 89 -1254/ 49 -1254  |                   |
| SND    | ---12KTS---         | 18KTS--- | 24KTS---            | -----CDC/CDM-     |
| GUD    | 47/ 40              | 11/ 39   | 11/ 38              | 943/1881          |
| BTR    | 53/ 40              | 51/ 40   | 36/ 39              | 1067/1881         |
| SNF    | ---12KTS---         | 18KTS--- | 24KTS---            | CZW---CDC/CDM-    |
| GUD    | 60/ 40              | 43/ 39   | 16/ 33              | 1676/2509         |
| RST    | 87/ 43              | 74/ 40   | 44/ 39              | 628-633 1887/2509 |
| BB     | MIN-A/R             | /        | MAXSE-A/R           | / MAX-A/R         |
| PSV QT | 32 - 32/ 37 - 37    | NSY      | 128 - 671/ 49 - 647 |                   |
| SNF    | ---12KTS---         | 18KTS--- | 24KTS---            | CZW---CDC/CDM-    |
| GUD    | 90/ 41              | 79/ 41   | 56/ 40              | 1676/2509         |
| RST    | 117/ 43             | 105/ 43  | 84/ 43              | 625-663 1887/2509 |
| BB     | MIN-A/R             | /        | MAXSE-A/R           | / MAX-A/R         |
| PSV QT | 103 - 654/ 48 - 631 | NSY      | 221 -1254/ 49 -1254 |                   |
| SNG    | ---12KTS---         | 18KTS--- | 24KTS---            | CZW---CDC/CDM-    |
| GUD    | 89/ 41              | 87/ 41   | 80/ 41              | 1676/2509         |
| RST    | 113/ 43             | 112/ 43  | 106/ 43             | 625-661 1887/2509 |
| BB     | MIN-A/R             | /        | MAXSE-A/R           | / MAX-A/R         |
| PSV QT | 96 - 644/ 48 - 48   | NSY      | 214 -1254/ 49 -1254 |                   |
| SNH    | ---12KTS---         | 18KTS--- | TD-----             | CDC/CDM-          |
| GUD    | 33/ 43              | 33/ 43   | 45                  | 796/ 796          |
| BTR    | 33/ 43              | 33/ 43   | 45                  | 914/ 914          |
| GJNP   | 33/ 43              | 33/ 43   | 45                  | 796/ 796          |
| RTOP   | 33/ 43              | 33/ 43   | 45                  | 914/ 914          |
| SNI    | 11/ 33              | DD 5     | PSV 1 - 1           | CDC 922 CDM 1286  |

SNY3/FOTS 82090300Z M0/ 18.7/1519/ 20/ 18.8/1519, 800/ 5.2/1485  
 1000/ 3.7/1482, 1600/ 2.2/1486, 2000/ 2.1/1492, 5000/ 1.5/1542  
 DPX(3599/ 1399)GR( 2.0)BL(1/1)WH( 5)WS(30)BD(5000)SLD( 20)  
 DP TGT 81 AVG SVL 1507 POD 50. CZ WS LIMITED

|        |         |       |       |           |       |         |       |                  |
|--------|---------|-------|-------|-----------|-------|---------|-------|------------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CDC/CDM-         |
| ALL    | 1/      | 1     |       | 1/        | 1     | 1/      | 1     | 971/1254         |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CZW---CDC/CDM-   |
| MD/1   | 1/      | 34    |       | 1/        | 34    | 1/      | 34    | - 1676/2509      |
| MD/2   | 1/      | 1     |       | 1/        | 1     | 1/      | 1     | 1570/2509        |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CZW---CDC/CDM-   |
| GUO    | 48/     | 39    |       | 35/       | 39    | 11/     | 39    | 960/1881         |
| RTD    | 49/     | 39    |       | 49/       | 39    | 49/     | 39    | - 1279/2509      |
| PSV QT | 32 -    | 32/   | 44 -  | 44        | NSY   | 89 -    | 1254/ | 49 - 660         |
| SMO    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CDC/CDM-         |
| GUO    | 7/      | 39    |       | 7/        | 39    | 7/      | 38    | 938/1881         |
| RTD    | 7/      | 39    |       | 7/        | 39    | 7/      | 39    | 1015/1881        |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CZW---CDC/CDM-   |
| GUO    | 52/     | 39    |       | 40/       | 39    | 1/      | 33    | 1570/2509        |
| RST    | 77/     | 40    |       | 56/       | 40    | 41/     | 39    | - 1782/2509      |
| BB     | MIN-A/R | /     |       | MAXSE-A/R | /     | MAX-A/R | /     |                  |
| PSV QT | 31 -    | 31/   | 36 -  | 36        | NSY   | 113 -   | 670/  | 49 - 644         |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CZW---CDC/CDM-   |
| GUO    | 76/     | 39    |       | 71/       | 39    | 50/     | 39    | 1570/2509        |
| RST    | 88/     | 40    |       | 88/       | 40    | 76/     | 40    | - 1782/2509      |
| BB     | MIN-A/R | /     |       | MAXSE-A/R | /     | MAX-A/R | /     |                  |
| PSV QT | 92 -    | 652/  | 48 -  | 629       | NSY   | 192 -   | 1254/ | 49 - 1254        |
| SNG    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | ----- | CZW---CDC/CDM-   |
| GUO    | 76/     | 39    |       | 73/       | 39    | 71/     | 39    | 1570/2509        |
| RST    | 88/     | 40    |       | 88/       | 40    | 88/     | 40    | - 1782/2509      |
| BB     | MIN-A/R | /     |       | MAXSE-A/R | /     | MAX-A/R | /     |                  |
| PSV QT | 86 -    | 642/  | 48 -  | 48        | NSY   | 175 -   | 1254/ | 49 - 1254        |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD      | ----- | CDC/CDM-         |
| GUO    | 1/      | 20    |       | 1/        | 20    | 45      |       | 788/ 788         |
| RTD    | 1/      | 20    |       | 1/        | 20    | 45      |       | 910/ 910         |
| GUOP   | 1/      | 20    |       | 1/        | 20    | 45      |       | 788/ 788         |
| RTPO   | 1/      | 20    |       | 1/        | 20    | 45      |       | 910/ 910         |
| SNJ    | 8/      | 33    |       | 00        | 5     | PSV     | 1 - 1 | CDC 9.0 CDM 1286 |

APPENDIX K

SAMPLE SHARPS 18.9 OUTPUT FOR SELF-NOISE UPDATES

SHARPS III PREDICTION BASED ON 03 16Z SEP 82 DATA

SNY1/FOTS 82090300Z M0/ 18.7/1519/ 20/ 18.8/1519, 800/ 5.2/1485  
 1000/ 3.7/1482, 1600/ 2.2/1486, 2000/ 2.1/1492, 5000/ 1.5/1542  
 DRX(3599/ 1399)GR( 2.0)BL(1/1)WH( 2)WS(10)BD(5000)SLD( 20)  
 NP TGT 81 AVG SVL 1507 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 22/ 33 22/ 22 20/ 16 971/1254

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 45/ 40 45/ 39 29/ 38 - 1782/2509  
 MD/2 23/ 31 23/ 31 23/ 30 1782/2509

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 69/ 40 54/ 39 39/ 39 1120/2509  
 RTR 99/ 41 87/ 41 77/ 40 - 1570/2509  
 PSV QT 32 - 32/ 45 - 45 NSY 89 -1881/ 49 -1254

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUN 61/ 40 41/ 39 12/ 38 958/1881  
 RTR 79/ 42 66/ 40 43/ 39 1120/1881

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 92/ 44 72/ 40 34/ 38 1887/2509  
 RST 125/ 45 102/ 45 75/ 41 625-646 2099/3136  
 BR MIN-A/R 25/223 MAXSE-A/R 20/283 MAX-A/R 20/311  
 PSV QT 96 - 96/ 48 - 48 NSY 238 -1254/ 49 -1254

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 133/ 45 118/ 45 89/ 44 1887/2509  
 RST 168/ 45 152/ 45 123/ 45 625-673 2099/3136  
 BR MIN-A/R 25/223 MAXSE-A/R 15/432 MAX-A/R 10/517  
 PSV QT 184 -1254/ 49 - 674 NSY 608 -1881/ 645 -1881

SNH ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUN 129/ 45 126/ 45 117/ 45 1887/2509  
 RST 164/ 45 161/ 45 152/ 45 625-673 2099/3136  
 BR MIN-A/R 25/223 MAXSE-A/R 15/418 MAX-A/R 10/496  
 PSV QT 174 - 691/ 49 - 659 NSY 586 -1881/ 584 -1881

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUN 37/ 45 37/ 45 45 811/ 811  
 RTR 37/ 45 37/ 45 45 925/ 925  
 GUNP 37/ 45 37/ 45 45 811/ 811  
 BTRP 37/ 45 37/ 45 45 925/ 925

SNH 20/ 34 DD 5 PSV 1 - 1 CDC 946 CDM 1286

SNY2/EOTS 82090300Z M0/ 18.7/1519/ 20/ 18.8/1519, 800/ 5.2/1485  
 1000/ 3.7/1482, 1600/ 2.2/1486, 2000/ 2.1/1492, 5000/ 1.5/1542  
 DRX(3599/ 1399)GR( 2.0)BL(1/1)WH( 3)WS(20)BD(5000)SLD( 20)  
 DP TGT 81 AVG SVL 1507 POD 50.

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 1/ 1 1/ 1 1/ 1 971/1254

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 1/ 39 1/ 39 1/ 38 - 1676/2509  
 MD/2 1/ 1 1/ 1 1/ 1 1676/2509

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 53/ 40 44/ 39 12/ 39 975/1881  
 BTR 81/ 40 74/ 40 55/ 40 - 1358/2509  
 PSV QT 32 - 32/ 45 - 45 NSY 89 -1254/ 49 -1254

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUD 47/ 40 11/ 39 11/ 38 943/1881  
 BTP 53/ 40 51/ 40 36/ 39 1067/1881

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 66/ 40 45/ 39 17/ 33 1676/2509  
 BST 90/ 43 76/ 41 45/ 39 626-635 1887/2509  
 BR MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV QT 44 - 44/ 43 - 43 NSY 145 - 677/ 49 - 655

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 95/ 41 84/ 41 62/ 40 1676/2509  
 BST 121/ 43 109/ 43 88/ 43 625-668 1887/2509  
 BR MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV QT 112 - 663/ 49 - 638 NSY 312 -1254/ 310 -1254

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 91/ 41 89/ 41 85/ 41 1676/2509  
 BST 118/ 43 115/ 43 110/ 43 625-663 1887/2509  
 BR MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV QT 106 - 656/ 48 - 633 NSY 223 -1254/ 49 -1254

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUD 33/ 43 33/ 43 45 796/ 796  
 BTR 33/ 43 33/ 43 45 914/ 914  
 GUDP 33/ 43 33/ 43 45 796/ 796  
 BTRP 33/ 43 33/ 43 45 914/ 914

SNI 11/ 33 DD 5 PSV 1 - 1 CDC 922 CDM 1286

SNY3/FOTS 82090300Z M0/ 18.7/1519/ 20/ 18.8/1519, 800/ 5.2/1485  
 1000/ 3.7/1482, 1600/ 2.2/1486, 2000/ 2.1/1492, 5000/ 1.5/1542  
 ORX(3599/ 1399)GR( 2.0)BL(1/1)WH( 5)WS(30)BD(5000)SLD( 20)  
 DP TGT 81 AVG SVL 1507 POD 50. CZ WS LIMITED

SNA ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 ALL 1/ 1 1/ 1 1/ 1 971/1254

SNR ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 MD/1 1/ 34 1/ 34 1/ 34 - 1676/2509  
 MD/2 1/ 1 1/ 1 1/ 1 1570/2509

SNC ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 48/ 39 35/ 39 11/ 39 960/1881  
 RTP 49/ 39 49/ 39 49/ 39 - 1279/2509  
 PSV OT 32 - 32/ 44 - 44 NSY 89 -1254/ 49 - 660

SND ---12KTS-----18KTS-----24KTS-----CDC/CDM-  
 GUD 7/ 39 7/ 39 7/ 38 938/1881  
 RTP 7/ 39 7/ 39 7/ 39 1015/1881

SNE ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 43/ 39 1/ 39 1/ 31 1570/2509  
 BST 56/ 40 56/ 40 36/ 39 - 1782/2509  
 RB MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV OT 16 - 16/ 25 - 25 NSY 83 - 640/ 48 - 48

SNF ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 72/ 39 55/ 39 41/ 39 1570/2509  
 BST 88/ 40 86/ 40 56/ 40 - 1782/2509  
 BB MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV OT 75 - 75/ 48 - 48 NSY 164 -1254/ 49 - 682

SNG ---12KTS-----18KTS-----24KTS-----CZW---CDC/CDM-  
 GUD 71/ 39 71/ 39 55/ 39 1570/2509  
 BST 88/ 40 88/ 40 87/ 40 - 1782/2509  
 RB MIN-A/R / MAXSE-A/R / MAX-A/R /  
 PSV OT 69 - 69/ 47 - 47 NSY 158 -1254/ 49 - 670

SNH ---12KTS-----18KTS-----TD-----CDC/CDM-  
 GUD 1/ 20 1/ 20 45 788/ 788  
 RTP 1/ 20 1/ 20 45 910/ 910  
 GUDP 1/ 20 1/ 20 45 788/ 788  
 RTPP 1/ 20 1/ 20 45 910/ 910

SNI 8/ 33 DD 5 PSV 1 - 1 CDC 910 COM 1286

APPENDIX L

UPDATE CARD IMAGES FOR SHARPS 18.11 (RAY ANGLE TREATMENT)

```

*ID EIGEN*18
*/
*/ PROGRAMMER - R. HOLT (OCEAN DATA SYSTEMS, INC.)
*/ DATE - 01 OCT 82
*/
*/ THE PURPOSE OF THIS UPDATE IS TO IMPLEMENT INTERIM TREATMENT OF
*/ DUCTED SURFACE REVERBERATION ANGLES AT THE SONAR AND SURFACE.
*/ THIS TREATMENT EMULATES THAT IN MODELS LIRA AND LORA WHICH PERFORM
*/ BETTER IN MATCHING ACTUAL SURFACE REVERBERATION DATA. THE RAY
*/ ANGLES AT THE SONAR AND SURFACE ARE CALCULATED AS A FUNCTION OF THE
*/ VELOCITIES AT THE SURFACE, SONAR, AND LAYER DEPTH.
*/
*ID EIGEN*17.1
C ***** LATEST CHANGE 01 OCT 82
*1 EIGEN*17.180
C
C      FOR DUCTED RAYS TO A SURFACE TARGET, CHANGE THE RAY ANGLES AT
C      THE SONAR AND SURFACE TO BE A FUNCTION OF THE VELOCITIES AT
C      THE SURFACE, SONAR, AND LAYER DEPTH. THIS IS TO EMULATE
C      ANGLE TREATMENT IN MODES LIRA AND LORA WHICH ARE BETTER
C      FOR MATCHING ACTUAL SURF REVERBERATION DATA.
C
C      IF ( ( ZS .GT. ZL ) .OR.
C      1      ( ZT .NE. 0.0 ) .OR.
C      2      ( IAMOS .NE. 1 ) ) GO TO 11900
C
C      SONANG = 0.5 * ACOS(VS/VL)
C      SURANG = SIGN(ACOS(VT/VL) * COS(SONANG), -1.0)
C      DO 11890 IXT = 1,NXT
C      IF (NRAY(IXT) .LT. 1) GO TO 11890
C      IF (CVT(IXT,1) .GT. VL) GO TO 1890
C
C      SONAR AND SURFACE ANGLES OF CURRENT RAY ARE TO BE OVERRIDDEN.
C
C      ETAS(IXT,1) = SONANG
C      ETAT(IXT,1) = SURANG
C
C      11890 CONTINUE
C      11900 CONTINUE
*C EIGEN

```

APPENDIX M

SAMPLE SHARPS 18.0 SURFACE REVERBERATION DATA

# SURFACE REVERBERATION

| I  | TIME(I)     | REVERB(I)   | DB     | I  | TIME(I)     | REVERB(I)   | DB     |
|----|-------------|-------------|--------|----|-------------|-------------|--------|
| 1  | .10000E+00  | .535678E-08 | -82.7  | 1  | .648627E+00 | .535678E-08 | -82.7  |
| 3  | .119725E+01 | .162572E-08 | -87.9  | 2  | .174588E+01 | .894435E-12 | -120.5 |
| 5  | .229451E+01 | .894435E-12 | -120.5 | 4  | .284314E+01 | .894435E-12 | -120.5 |
| 7  | .339176E+01 | .464195E-13 | -133.3 | 6  | .394039E+01 | .464195E-13 | -133.3 |
| 9  | .448902E+01 | .464195E-13 | -133.3 | 8  | .503765E+01 | .240313E-13 | -136.2 |
| 11 | .558627E+01 | .164022E-14 | -147.9 | 10 | .613490E+01 | .164022E-14 | -147.9 |
| 13 | .668353E+01 | .104737E-13 | -139.8 | 12 | .723216E+01 | .611009E-14 | -142.1 |
| 15 | .778078E+01 | .304283E-15 | -155.2 | 14 | .832941E+01 | .276183E-15 | -155.6 |
| 17 | .887804E+01 | .111397E-15 | -159.5 | 16 | .942667E+01 | .516868E-16 | -162.9 |
| 19 | .997529E+01 | .424875E-16 | -163.7 | 18 | .105239E+02 | .424875E-16 | -163.7 |
| 21 | .110725E+02 | .982446E-17 | -170.1 | 20 | .116212E+02 | .981365E-17 | -170.1 |
| 23 | .121698E+02 | .981365E-17 | -170.1 | 22 | .127184E+02 | .106112E-16 | -169.7 |
| 25 | .132671E+02 | .832749E-17 | -170.8 | 24 | .138157E+02 | .832989E-17 | -170.8 |
| 27 | .143643E+02 | .759493E-17 | -171.2 | 26 | .149129E+02 | .580607E-17 | -172.4 |
| 29 | .154616E+02 | .561421E-17 | -172.5 | 28 | .160102E+02 | .511535E-17 | -172.9 |
| 31 | .165588E+02 | .517675E-17 | -172.9 | 30 | .171075E+02 | .356663E-17 | -174.5 |
| 33 | .176561E+02 | .365001E-17 | -174.4 | 32 | .182047E+02 | .365001E-17 | -174.4 |
| 35 | .187533E+02 | .298529E-17 | -175.3 | 34 | .193020E+02 | .285443E-17 | -175.4 |
| 37 | .198506E+02 | .287045E-17 | -175.4 | 36 | .203992E+02 | .293562E-17 | -175.3 |
| 39 | .209478E+02 | .168713E-17 | -177.7 | 38 | .214965E+02 | .160363E-17 | -177.9 |
| 41 | .220451E+02 | .160364E-17 | -177.9 | 40 | .225937E+02 | .721043E-18 | -181.4 |
| 43 | .231424E+02 | .787282E-18 | -181.0 | 42 | .236910E+02 | .787282E-18 | -181.0 |
| 45 | .242396E+02 | .787443E-18 | -181.0 | 44 | .247882E+02 | .313813E-18 | -185.0 |
| 47 | .253369E+02 | .313624E-18 | -185.0 | 46 | .258855E+02 | .314343E-18 | -185.0 |
| 49 | .264341E+02 | .979916E-19 | -190.1 | 48 | .269827E+02 | .980376E-19 | -190.1 |
| 51 | .275314E+02 | .976010E-19 | -190.1 | 50 | .280800E+02 | .100213E-18 | -190.0 |
| 53 | .286286E+02 | .876814E-19 | -190.6 | 52 | .291773E+02 | .873697E-19 | -190.6 |
| 55 | .297259E+02 | .698699E-19 | -191.6 | 54 | .302745E+02 | .560146E-19 | -192.5 |
| 57 | .308231E+02 | .558084E-19 | -192.5 | 56 | .313718E+02 | .596379E-19 | -192.2 |
| 59 | .319204E+02 | .515232E-19 | -192.9 | 58 | .324690E+02 | .501742E-19 | -193.0 |
| 61 | .330176E+02 | .501743E-19 | -193.0 | 60 | .335663E+02 | .125262E-18 | -189.0 |
| 63 | .341149E+02 | .121358E-18 | -189.2 | 62 | .346635E+02 | .121358E-18 | -189.2 |
| 65 | .352122E+02 | .202851E-18 | -186.9 | 64 | .357608E+02 | .193842E-18 | -187.1 |
| 67 | .363094E+02 | .193721E-18 | -187.1 | 66 | .368580E+02 | .204094E-18 | -186.9 |
| 69 | .374067E+02 | .198081E-18 | -187.0 | 68 | .379553E+02 | .198057E-18 | -187.0 |
| 71 | .385039E+02 | .198011E-18 | -187.0 | 70 | .390525E+02 | .151411E-18 | -188.2 |
| 73 | .396012E+02 | .148461E-18 | -188.3 | 72 | .401498E+02 | .148535E-18 | -188.3 |
| 75 | .406984E+02 | .864982E-19 | -190.6 | 74 | .412471E+02 | .851019E-19 | -190.7 |
| 77 | .417957E+02 | .851854E-19 | -190.7 | 76 | .423443E+02 | .379579E-19 | -194.2 |
| 79 | .428929E+02 | .378640E-19 | -194.2 | 78 | .434416E+02 | .373250E-19 | -194.3 |
| 81 | .439902E+02 | .373103E-19 | -194.3 | 80 | .445388E+02 | .123036E-19 | -199.1 |
| 83 | .450875E+02 | .120628E-19 | -199.2 | 82 | .456361E+02 | .118908E-19 | -199.2 |
| 85 | .461848E+02 | .261459E-20 | -205.8 | 84 | .467333E+02 | .257595E-20 | -205.9 |
| 87 | .472821E+02 |             |        | 86 |             |             |        |

AD-A121 780

SHARPS III UPDATE REVIEW--AUTUMN 1982(U) NAVAL OCEAN  
RESEARCH AND DEVELOPMENT ACTIVITY NSTL STATION MS  
R M HOLT 14 SEP 82 NORDA-TN-169

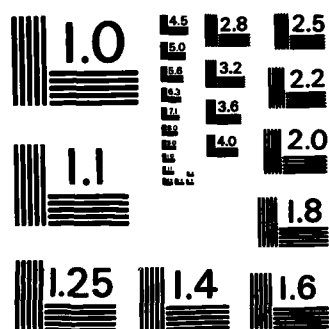
2/2

UNCLASSIFIED

F/G 17/1

NL





|     |             |             |        |     |             |             |        |
|-----|-------------|-------------|--------|-----|-------------|-------------|--------|
| 87  | .472820E+02 | .236378E-20 | -206.3 | 88  | .478306E+02 | .141986E-20 | -208.5 |
| 89  | .483792E+02 | .545579E-21 | -212.6 | 90  | .489278E+02 | .423022E-21 | -213.7 |
| 91  | .494765E+02 | .422604E-21 | -213.7 | 92  | .500251E+02 | .645881E-21 | -211.9 |
| 93  | .505737E+02 | .616535E-21 | -212.1 | 94  | .511224E+02 | .614607E-21 | -212.1 |
| 95  | .516710E+02 | .706304E-21 | -211.5 | 96  | .522196E+02 | .709241E-21 | -211.5 |
| 97  | .527682E+02 | .712435E-21 | -211.5 | 98  | .533169E+02 | .712272E-21 | -211.5 |
| 99  | .538655E+02 | .452598E-21 | -213.4 | 100 | .544141E+02 | .458372E-21 | -213.4 |
| 101 | .549627E+02 | .458264E-21 | -213.4 | 102 | .555114E+02 | .224381E-21 | -216.5 |
| 103 | .560600E+02 | .219350E-21 | -216.6 | 104 | .566086E+02 | .218631E-21 | -216.6 |
| 105 | .571573E+02 | .223791E-21 | -216.5 | 106 | .577059E+02 | .260731E-21 | -215.8 |
| 107 | .582545E+02 | .259586E-21 | -215.9 | 108 | .588031E+02 | .259565E-21 | -215.9 |
| 109 | .593518E+02 | .595674E-21 | -212.2 | 110 | .599004E+02 | .593989E-21 | -212.3 |
| 111 | .604490E+02 | .593406E-21 | -212.3 | 112 | .609976E+02 | .828364E-21 | -210.8 |
| 113 | .615463E+02 | .103186E-20 | -209.9 | 114 | .620949E+02 | .103153E-20 | -209.9 |
| 115 | .626435E+02 | .103152E-20 | -209.9 | 116 | .631922E+02 | .144071E-20 | -208.4 |
| 117 | .637408E+02 | .144135E-20 | -208.4 | 118 | .642894E+02 | .144116E-20 | -208.4 |
| 119 | .648380E+02 | .167098E-20 | -207.8 | 120 | .653867E+02 | .171705E-20 | -207.7 |
| 121 | .659353E+02 | .171694E-20 | -207.7 | 122 | .664839E+02 | .171694E-20 | -207.7 |
| 123 | .670325E+02 | .171218E-20 | -207.7 | 124 | .675812E+02 | .171234E-20 | -207.7 |
| 125 | .681298E+02 | .171227E-20 | -207.7 | 126 | .686784E+02 | .148461E-20 | -208.3 |
| 127 | .692271E+02 | .148623E-20 | -208.3 | 128 | .697757E+02 | .148619E-20 | -208.3 |
| 129 | .703243E+02 | .148619E-20 | -208.3 | 130 | .708729E+02 | .115864E-20 | -209.4 |
| 131 | .714216E+02 | .115864E-20 | -209.4 | 132 | .719702E+02 | .115863E-20 | -209.4 |
| 133 | .725188E+02 | .860483E-21 | -210.7 | 134 | .730675E+02 | .860483E-21 | -210.7 |
| 135 | .736161E+02 | .860475E-21 | -210.7 | 136 | .741647E+02 | .860042E-21 | -210.7 |
| 137 | .747133E+02 | .678260E-21 | -211.7 | 138 | .752620E+02 | .678260E-21 | -211.7 |
| 139 | .758106E+02 | .678254E-21 | -211.7 | 140 | .763592E+02 | .301849E-21 | -215.2 |
| 141 | .769078E+02 | .301849E-21 | -215.2 | 142 | .774565E+02 | .301846E-21 | -215.2 |
| 143 | .780051E+02 | .280016E-21 | -215.5 | 144 | .785537E+02 | .740334E-22 | -221.3 |
| 145 | .791024E+02 | .740334E-22 | -221.3 | 146 | .796510E+02 | .741201E-22 | -221.3 |
| 147 | .801996E+02 | .674494E-17 | -171.7 | 148 | .807482E+02 | .674494E-17 | -171.7 |
| 149 | .812969E+02 | .674494E-17 | -171.7 | 150 | .818455E+02 | .575133E-17 | -172.4 |
| 151 | .823941E+02 | .440277E-18 | -183.6 | 152 | .829427E+02 | .440277E-18 | -183.6 |
| 153 | .834914E+02 | .440277E-18 | -183.6 | 154 | .840400E+02 | .768205E-19 | -191.1 |
| 155 | .845886E+02 | .768205E-19 | -191.1 | 156 | .851373E+02 | .768205E-19 | -191.1 |
| 157 | .856859E+02 | .763935E-19 | -191.2 | 158 | .862345E+02 | .190950E-19 | -197.2 |
| 159 | .867831E+02 | .190950E-19 | -197.2 | 160 | .873318E+02 | .190448E-19 | -197.2 |
| 161 | .878804E+02 | .616817E-20 | -202.1 | 162 | .884290E+02 | .616817E-20 | -202.1 |
| 163 | .889776E+02 | .616814E-20 | -202.1 | 164 | .895263E+02 | .612048E-20 | -202.1 |
| 165 | .900749E+02 | .370402E-22 | -224.3 | 166 | .906235E+02 | .370402E-22 | -224.3 |
| 167 | .911722E+02 | .100860E-22 | -230.0 | 168 | .917208E+02 | .188725E-25 | -257.2 |
| 169 | .922694E+02 | .188725E-25 | -257.2 | 170 | .928180E+02 | .113906E-25 | -259.4 |
| 171 | .933667E+02 | .113906E-25 | -259.4 | 172 | .939153E+02 | .113906E-25 | -259.4 |

|     |             |             |        |     |             |             |        |
|-----|-------------|-------------|--------|-----|-------------|-------------|--------|
| 173 | .944639E+02 | .108409E-25 | -259.6 | 174 | .950125E+02 | .515677E-26 | -262.9 |
| 175 | .955612E+02 | .602873E-26 | -262.2 | 176 | .961098E+02 | .602870E-26 | -262.2 |
| 177 | .966584E+02 | .385036E-26 | -264.1 | 178 | .972071E+02 | .345549E-26 | -264.6 |
| 179 | .977557E+02 | .345858E-26 | -264.6 | 180 | .983043E+02 | .358744E-26 | -264.5 |
| 181 | .988529E+02 | .312184E-26 | -265.1 | 182 | .994016E+02 | .312444E-26 | -265.1 |
| 183 | .999502E+02 | .312443E-26 | -265.1 | 184 | .100499E+03 | .356855E-26 | -264.5 |
| 185 | .101047E+03 | .341552E-26 | -264.7 | 186 | .101596E+03 | .341552E-26 | -264.7 |
| 187 | .102145E+03 | .375329E-26 | -264.3 | 188 | .102693E+03 | .348399E-26 | -264.6 |
| 189 | .103242E+03 | .348524E-26 | -264.6 | 190 | .103791E+03 | .348524E-26 | -264.6 |
| 191 | .104339E+03 | .315906E-26 | -265.0 | 192 | .104888E+03 | .316155E-26 | -265.0 |
| 193 | .105436E+03 | .316155E-26 | -265.0 | 194 | .105985E+03 | .259856E-26 | -265.9 |
| 195 | .106534E+03 | .256932E-26 | -265.9 | 196 | .107082E+03 | .256932E-26 | -265.9 |
| 197 | .107631E+03 | .230070E-26 | -266.4 | 198 | .108180E+03 | .191571E-26 | -267.2 |
| 199 | .108728E+03 | .191571E-26 | -267.2 | 200 | .109277E+03 | .191571E-26 | -267.2 |
| 201 | .109825E+03 | .137472E-26 | -268.6 | 202 | .110374E+03 | .137483E-26 | -268.6 |
| 203 | .110923E+03 | .137483E-26 | -268.6 | 204 | .111471E+03 | .104031E-26 | -269.8 |
| 205 | .112020E+03 | .105140E-26 | -269.8 | 206 | .112569E+03 | .105140E-26 | -269.8 |
| 207 | .113117E+03 | .105140E-26 | -269.8 | 208 | .113666E+03 | .983638E-27 | -270.1 |
| 209 | .114215E+03 | .983638E-27 | -270.1 | 210 | .114763E+03 | .983638E-27 | -270.1 |
| 211 | .115312E+03 | .115529E-26 | -269.4 | 212 | .115860E+03 | .115323E-26 | -269.4 |
| 213 | .116409E+03 | .115323E-26 | -269.4 | 214 | .116958E+03 | .115323E-26 | -269.4 |
| 215 | .117506E+03 | .150135E-26 | -268.2 | 216 | .118055E+03 | .150135E-26 | -268.2 |
| 217 | .118604E+03 | .150135E-26 | -268.2 | 218 | .119152E+03 | .191054E-26 | -267.2 |
| 219 | .119701E+03 | .191054E-26 | -267.2 | 220 | .120249E+03 | .191054E-26 | -267.2 |
| 221 | .120798E+03 | .197998E-26 | -267.0 | 222 | .121347E+03 | .229918E-26 | -266.4 |
| 223 | .121895E+03 | .229918E-26 | -266.4 | 224 | .122444E+03 | .229918E-26 | -266.4 |
| 225 | .122993E+03 | .263739E-26 | -265.8 | 226 | .123541E+03 | .263739E-26 | -265.8 |
| 227 | .124090E+03 | .263739E-26 | -265.8 | 228 | .124638E+03 | .281226E-26 | -265.5 |
| 229 | .125187E+03 | .289374E-26 | -265.4 | 230 | .125736E+03 | .289374E-26 | -265.4 |
| 231 | .126284E+03 | .289374E-26 | -265.4 | 232 | .126833E+03 | .368432E-27 | -274.3 |
| 233 | .127382E+03 | .368432E-27 | -274.3 | 234 | .127930E+03 | .368432E-27 | -274.3 |
| 235 | .128479E+03 | .225595E-29 | -294.9 | 236 | .129027E+03 | .225595E-29 | -294.9 |
| 237 | .129576E+03 | .225595E-29 | -294.9 | 238 | .130125E+03 | .344169E-30 | -298.7 |
| 239 | .130673E+03 | 0.          | -300.0 | 240 | .131222E+03 | 0.          | -300.0 |
| 241 | .131771E+03 | 0.          | -300.0 | 242 | .132319E+03 | 0.          | -300.0 |
| 243 | .132868E+03 | 0.          | -300.0 | 244 | .133416E+03 | 0.          | -300.0 |
| 245 | .133965E+03 | 0.          | -300.0 | 246 | .134514E+03 | 0.          | -300.0 |
| 247 | .135062E+03 | 0.          | -300.0 | 248 | .135611E+03 | 0.          | -300.0 |
| 249 | .136160E+03 | 0.          | -300.0 | 250 | .136708E+03 | 0.          | -300.0 |
| 251 | .137257E+03 | 0.          | -300.0 | 252 | .137805E+03 | 0.          | -300.0 |
| 253 | .138354E+03 | 0.          | -300.0 | 254 | .138903E+03 | 0.          | -300.0 |
| 255 | .139451E+03 | 0.          | -300.0 | 256 | .140000E+03 | 0.          | -300.0 |

**APPENDIX N**  
**SAMPLE SHARPS 18.11 SURFACE REVERBERATION DATA**

## SURFACE REVERBERATION

| I  | TIME(I)     | REVERB(I)   | DR     | I  | TIME(I)     | REVERB(I)   | DR     |
|----|-------------|-------------|--------|----|-------------|-------------|--------|
| 1  | .10000E+00  | .119983F-07 | -79.2  | 2  | .648627E+00 | .119983E-07 | -79.2  |
| 3  | .119725E+01 | .364181E-08 | -84.4  | 4  | .174588E+01 | .265632E-11 | -115.8 |
| 5  | .229451E+01 | .265632E-11 | -115.8 | 6  | .284314E+01 | .265632E-11 | -115.8 |
| 7  | .339176E+01 | .258419E-12 | -125.9 | 8  | .394039E+01 | .258419E-12 | -125.9 |
| 9  | .448902E+01 | .258419E-12 | -125.9 | 10 | .503765E+01 | .133415E-12 | -128.7 |
| 11 | .558627E+01 | .839256E-14 | -140.8 | 12 | .613490E+01 | .839256E-14 | -140.8 |
| 13 | .668353E+01 | .216588E-13 | -136.6 | 14 | .723216E+01 | .951072E-14 | -140.2 |
| 15 | .778078E+01 | .822135E-15 | -150.9 | 16 | .832941E+01 | .777387E-15 | -151.1 |
| 17 | .887804E+01 | .437149E-15 | -153.6 | 18 | .942667E+01 | .166498E-15 | -157.8 |
| 19 | .997529E+01 | .141898E-15 | -158.5 | 20 | .105239E+02 | .141898E-15 | -158.5 |
| 21 | .110725E+02 | .497639E-16 | -163.0 | 22 | .116212E+02 | .497391E-16 | -163.0 |
| 23 | .121698E+02 | .497391E-16 | -163.0 | 24 | .127184E+02 | .507299E-16 | -162.9 |
| 25 | .132671E+02 | .369008E-16 | -164.3 | 26 | .138157E+02 | .369032E-16 | -164.3 |
| 27 | .143643E+02 | .347542E-16 | -164.6 | 28 | .149129E+02 | .246511E-16 | -166.1 |
| 29 | .154616E+02 | .244586E-16 | -166.1 | 30 | .160102E+02 | .231744E-16 | -166.3 |
| 31 | .165588E+02 | .232136E-16 | -166.3 | 32 | .171075E+02 | .166385E-16 | -167.8 |
| 33 | .176561E+02 | .169452E-16 | -167.7 | 34 | .182047E+02 | .169452E-16 | -167.7 |
| 35 | .187533E+02 | .125665E-16 | -169.0 | 36 | .193020E+02 | .124333E-16 | -169.1 |
| 37 | .198506E+02 | .124523E-16 | -169.0 | 38 | .203992E+02 | .125176E-16 | -169.0 |
| 39 | .209478E+02 | .583354E-17 | -172.3 | 40 | .214965E+02 | .574891E-17 | -172.4 |
| 41 | .220451E+02 | .574893E-17 | -172.4 | 42 | .225937E+02 | .231430E-17 | -176.4 |
| 43 | .231424E+02 | .233122E-17 | -176.3 | 44 | .236910E+02 | .233122E-17 | -176.3 |
| 45 | .242396E+02 | .233166E-17 | -176.3 | 46 | .247882E+02 | .836933E-18 | -180.8 |
| 47 | .253369E+02 | .836744E-18 | -180.8 | 48 | .258855E+02 | .838405E-18 | -180.8 |
| 49 | .264341E+02 | .287112E-18 | -185.4 | 50 | .269827E+02 | .287158E-18 | -185.4 |
| 51 | .275314E+02 | .286145E-18 | -185.4 | 52 | .280800E+02 | .255313E-18 | -185.9 |
| 53 | .286286E+02 | .187446E-18 | -187.3 | 54 | .291773E+02 | .186654E-18 | -187.3 |
| 55 | .297259E+02 | .169154E-18 | -187.7 | 56 | .302745E+02 | .126292E-18 | -189.0 |
| 57 | .308231E+02 | .125943E-18 | -189.0 | 58 | .313718E+02 | .129773E-18 | -188.9 |
| 59 | .319204E+02 | .105420E-18 | -189.8 | 60 | .324690E+02 | .987121E-19 | -190.1 |
| 61 | .330176E+02 | .987122E-19 | -190.1 | 62 | .335663E+02 | .161590E-18 | -187.9 |
| 63 | .341149E+02 | .150763E-18 | -188.2 | 64 | .346635E+02 | .150763E-18 | -188.2 |
| 65 | .352122E+02 | .232253E-18 | -186.3 | 66 | .357608E+02 | .209821E-18 | -186.8 |
| 67 | .363094E+02 | .209202E-18 | -186.8 | 68 | .368580E+02 | .219570E-18 | -186.6 |
| 69 | .374067E+02 | .205908E-18 | -186.9 | 70 | .379553E+02 | .205750E-18 | -186.9 |
| 71 | .385039E+02 | .205674E-18 | -186.9 | 72 | .390525E+02 | .159063E-18 | -188.0 |
| 73 | .396012E+02 | .151871E-18 | -188.2 | 74 | .401498E+02 | .151895E-18 | -188.2 |
| 75 | .406984E+02 | .898509E-19 | -190.5 | 76 | .412471E+02 | .864673E-19 | -190.6 |
| 77 | .417957E+02 | .865409E-19 | -190.6 | 78 | .423443E+02 | .393026E-19 | -194.1 |
| 79 | .428929E+02 | .390738E-19 | -194.1 | 80 | .434416E+02 | .378272E-19 | -194.2 |
| 81 | .439902E+02 | .378059E-19 | -194.2 | 82 | .445388E+02 | .127977E-19 | -198.9 |
| 83 | .450875E+02 | .122416E-19 | -199.1 | 84 | .456361E+02 | .120689E-19 | -199.2 |
| 85 | .461847E+02 | .278979E-20 | -205.5 | 86 | .467333E+02 | .269580E-20 | -205.7 |

|     |             |             |        |     |             |             |        |
|-----|-------------|-------------|--------|-----|-------------|-------------|--------|
| 87  | .472820E+02 | .242370E-20 | -206.2 | 88  | .478306E+02 | .147819E-20 | -208.3 |
| 89  | .483792E+02 | .603907E-21 | -212.2 | 90  | .489278E+02 | .444603E-21 | -213.5 |
| 91  | .494765E+02 | .443561E-21 | -213.5 | 92  | .500251E+02 | .666721E-21 | -211.8 |
| 93  | .505737E+02 | .628831E-21 | -212.0 | 94  | .511224E+02 | .624114E-21 | -212.0 |
| 95  | .516710E+02 | .715529E-21 | -211.5 | 96  | .522196E+02 | .718466E-21 | -211.4 |
| 97  | .527682E+02 | .718162E-21 | -211.4 | 98  | .533169E+02 | .7178A2E-21 | -211.4 |
| 99  | .538655E+02 | .458193E-21 | -213.4 | 100 | .544141E+02 | .462438E-21 | -213.3 |
| 101 | .549627E+02 | .462096E-21 | -213.4 | 102 | .555114E+02 | .228208E-21 | -216.4 |
| 103 | .560600E+02 | .223177E-21 | -216.5 | 104 | .566086E+02 | .221326E-21 | -216.5 |
| 105 | .571573E+02 | .226465E-21 | -216.4 | 106 | .577059E+02 | .263403E-21 | -215.8 |
| 107 | .582545E+02 | .261309E-21 | -215.8 | 108 | .588031E+02 | .261273E-21 | -215.8 |
| 109 | .593518E+02 | .597381E-21 | -212.2 | 110 | .599004E+02 | .595697E-21 | -212.2 |
| 111 | .604490E+02 | .594477E-21 | -212.3 | 112 | .609976E+02 | .829435E-21 | -210.8 |
| 113 | .615463E+02 | .103293E-20 | -209.9 | 114 | .620949E+02 | .103217E-20 | -209.9 |
| 115 | .626435E+02 | .103215E-20 | -209.9 | 116 | .631922E+02 | .144134E-20 | -208.4 |
| 117 | .637408E+02 | .144198E-20 | -208.4 | 118 | .642894E+02 | .144151E-20 | -208.4 |
| 119 | .648380E+02 | .167134E-20 | -207.8 | 120 | .653867E+02 | .171741E-20 | -207.7 |
| 121 | .659353E+02 | .171713E-20 | -207.7 | 122 | .664839E+02 | .171713E-20 | -207.7 |
| 123 | .670325E+02 | .171236E-20 | -207.7 | 124 | .675812E+02 | .171252E-20 | -207.7 |
| 125 | .681298E+02 | .171236E-20 | -207.7 | 126 | .686784E+02 | .148471E-20 | -208.3 |
| 127 | .692271E+02 | .148633E-20 | -208.3 | 128 | .697757E+02 | .148624E-20 | -208.3 |
| 129 | .703243E+02 | .148624E-20 | -208.3 | 130 | .708729E+02 | .115869E-20 | -209.4 |
| 131 | .714216E+02 | .115869E-20 | -209.4 | 132 | .719702E+02 | .115865E-20 | -209.4 |
| 133 | .725188E+02 | .860505E-21 | -210.7 | 134 | .730675E+02 | .860505E-21 | -210.7 |
| 135 | .736161E+02 | .860486E-21 | -210.7 | 136 | .741647E+02 | .860053E-21 | -210.7 |
| 137 | .747133E+02 | .678271E-21 | -211.7 | 138 | .752620E+02 | .678271E-21 | -211.7 |
| 139 | .758106E+02 | .678258E-21 | -211.7 | 140 | .763592E+02 | .301853E-21 | -215.2 |
| 141 | .769078E+02 | .301853E-21 | -215.2 | 142 | .774565E+02 | .301847E-21 | -215.2 |
| 143 | .780051E+02 | .280017E-21 | -215.5 | 144 | .785537E+02 | .740345E-22 | -221.3 |
| 145 | .791024E+02 | .740343E-22 | -221.3 | 146 | .796510E+02 | .742969E-22 | -221.3 |
| 147 | .801996E+02 | .674494E-17 | -171.7 | 148 | .807482E+02 | .674494E-17 | -171.7 |
| 149 | .812969E+02 | .674494E-17 | -171.7 | 150 | .818455E+02 | .575133E-17 | -172.4 |
| 151 | .823941E+02 | .440278E-18 | -183.6 | 152 | .829427E+02 | .440278E-18 | -183.6 |
| 153 | .834914E+02 | .440277E-18 | -183.6 | 154 | .840400E+02 | .768205E-19 | -191.1 |
| 155 | .845886E+02 | .768205E-19 | -191.1 | 156 | .851373E+02 | .768205E-19 | -191.1 |
| 157 | .856859E+02 | .763935E-19 | -191.2 | 158 | .862345E+02 | .190950E-19 | -197.2 |
| 159 | .867831E+02 | .190950E-19 | -197.2 | 160 | .873318E+02 | .190448E-19 | -197.2 |
| 161 | .878804E+02 | .616818E-20 | -202.1 | 162 | .884290E+02 | .616818E-20 | -202.1 |
| 163 | .889776E+02 | .616814E-20 | -202.1 | 164 | .895263E+02 | .612048E-20 | -202.1 |
| 165 | .900749E+02 | .370402E-22 | -224.3 | 166 | .906235E+02 | .370402E-22 | -224.3 |
| 167 | .911722E+02 | .100860E-22 | -230.0 | 168 | .917208E+02 | .188733E-25 | -257.2 |
| 169 | .922694E+02 | .188732E-25 | -257.2 | 170 | .928180E+02 | .113910E-25 | -259.4 |
| 171 | .933667E+02 | .113910E-25 | -259.4 | 172 | .939153E+02 | .113910E-25 | -259.4 |

|     |             |             |        |     |             |             |        |
|-----|-------------|-------------|--------|-----|-------------|-------------|--------|
| 173 | .944639E+02 | .108411E-25 | -259.6 | 174 | .950125E+02 | .515692E-26 | -262.9 |
| 175 | .955612E+02 | .602888E-26 | -262.2 | 176 | .961098E+02 | .602882E-26 | -262.2 |
| 177 | .966584E+02 | .385043E-26 | -264.1 | 178 | .972071E+02 | .345556E-26 | -264.6 |
| 179 | .977557E+02 | .345865E-26 | -264.6 | 180 | .983043E+02 | .358747E-26 | -264.5 |
| 181 | .988529E+02 | .312187E-26 | -265.1 | 182 | .994016E+02 | .312447E-26 | -265.1 |
| 183 | .999502E+02 | .312445E-26 | -265.1 | 184 | .100499E+03 | .356856E-26 | -264.5 |
| 185 | .101047E+03 | .341554E-26 | -264.7 | 186 | .101596E+03 | .341554E-26 | -264.7 |
| 187 | .102145E+03 | .375330E-26 | -264.3 | 188 | .102693E+03 | .348400E-26 | -264.6 |
| 189 | .103242E+03 | .348525E-26 | -264.6 | 190 | .103791E+03 | .348525E-26 | -264.6 |
| 191 | .104339E+03 | .315906E-26 | -265.0 | 192 | .104888E+03 | .316155E-26 | -265.0 |
| 193 | .105436E+03 | .316155E-26 | -265.0 | 194 | .105985E+03 | .259856E-26 | -265.9 |
| 195 | .106534E+03 | .256932E-26 | -265.9 | 196 | .107082E+03 | .256932E-26 | -265.9 |
| 197 | .107631E+03 | .230070E-26 | -266.4 | 198 | .108180E+03 | .191571E-26 | -267.2 |
| 199 | .108728E+03 | .191571E-26 | -267.2 | 200 | .109277E+03 | .191571E-26 | -267.2 |
| 201 | .109825E+03 | .137472E-26 | -268.6 | 202 | .110374E+03 | .137483E-26 | -268.6 |
| 203 | .110923E+03 | .137483E-26 | -268.6 | 204 | .111471E+03 | .104031E-26 | -269.8 |
| 205 | .112020E+03 | .105140E-26 | -269.8 | 206 | .112569E+03 | .105140E-26 | -269.8 |
| 207 | .113117E+03 | .105140E-26 | -269.8 | 208 | .113666E+03 | .983639E-27 | -270.1 |
| 209 | .114215E+03 | .983639E-27 | -270.1 | 210 | .114763E+03 | .983639E-27 | -270.1 |
| 211 | .115312E+03 | .115529E-26 | -269.4 | 212 | .115860E+03 | .115323E-26 | -269.4 |
| 213 | .116409E+03 | .115323E-26 | -269.4 | 214 | .116958E+03 | .115323E-26 | -269.4 |
| 215 | .117506E+03 | .150135E-26 | -268.2 | 216 | .118055E+03 | .150135E-26 | -268.2 |
| 217 | .118604E+03 | .150135E-26 | -268.2 | 218 | .119152E+03 | .191054E-26 | -267.2 |
| 219 | .119701E+03 | .191054E-26 | -267.2 | 220 | .120249E+03 | .191054E-26 | -267.2 |
| 221 | .120798E+03 | .197998E-26 | -267.0 | 222 | .121347E+03 | .229918E-26 | -266.4 |
| 223 | .121895E+03 | .229918E-26 | -266.4 | 224 | .122444E+03 | .229918E-26 | -266.4 |
| 225 | .122993E+03 | .263739E-26 | -265.8 | 226 | .123541E+03 | .263739E-26 | -265.8 |
| 227 | .124090E+03 | .263739E-26 | -265.8 | 228 | .124638E+03 | .281226E-26 | -265.5 |
| 229 | .125187E+03 | .289374E-26 | -265.4 | 230 | .125736E+03 | .289374E-26 | -265.4 |
| 231 | .126284E+03 | .289374E-26 | -265.4 | 232 | .126833E+03 | .368432E-27 | -274.3 |
| 233 | .127382E+03 | .368432E-27 | -274.3 | 234 | .127930E+03 | .368432E-27 | -274.3 |
| 235 | .128479E+03 | .225595E-29 | -294.9 | 236 | .129027E+03 | .225595E-29 | -294.9 |
| 237 | .129576E+03 | .225595E-29 | -294.9 | 238 | .130125E+03 | .344169E-30 | -298.7 |
| 239 | .130673E+03 | 0.          | -300.0 | 240 | .131222E+03 | 0.          | -300.0 |
| 241 | .131771E+03 | 0.          | -300.0 | 242 | .132319E+03 | 0.          | -300.0 |
| 243 | .132868E+03 | 0.          | -300.0 | 244 | .133416E+03 | 0.          | -300.0 |
| 245 | .133965E+03 | 0.          | -300.0 | 246 | .134514E+03 | 0.          | -300.0 |
| 247 | .135062E+03 | 0.          | -300.0 | 248 | .135611E+03 | 0.          | -300.0 |
| 249 | .136160E+03 | 0.          | -300.0 | 250 | .136708E+03 | 0.          | -300.0 |
| 251 | .137257E+03 | 0.          | -300.0 | 252 | .137805E+03 | 0.          | -300.0 |
| 253 | .138354E+03 | 0.          | -300.0 | 254 | .138903E+03 | 0.          | -300.0 |
| 255 | .139451E+03 | 0.          | -300.0 | 256 | .140000E+03 | 0.          | -300.0 |

APPENDIX O

SAMPLE SHARPS 19.0 OUTPUT

SHAPPS III PREDICTION BASED ON 27 14Z SEP 82 DATA

01SP/FOTS 81032700Z M0/ 17.5/1513/ 32/ 17.5/1514, 34/ 17.5/1514  
 90/ 16.0/1510, 140/ 13.9/1504, 180/ 12.2/1499, 200/ 11.5/1497  
 240/ 10.4/1494, 300/ 9.0/1491, 400/ 7.9/1488, 500/ 7.0/1487  
 800/ 5.2/1484, 1200/ 3.9/1486, 2000/ 2.4/1493, 2200/ 2.2/1496  
 3000/ 2.0/1509, 4000/ 1.9/1526, 4206/ 1.9/1529  
 DRX(3260/ 943)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(4206)SLD( 34)  
 DP TGT 95 AVG SVL 1501 POD 50.

|        |            |          |                |           |                |           |                |                   |
|--------|------------|----------|----------------|-----------|----------------|-----------|----------------|-------------------|
| SNA    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CDC/CDM-          |
| ALL    | 22/        | 32       |                | 22/       | 24             | 1/        | 12             | 922/1190          |
| SNR    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CZW---CDC/CDM-    |
| MD/1   | 100/       | 39       |                | 74/       | 39             | 32/       | 39             | - 2099/3571       |
| MD/2   | 23/        | 28       |                | 23/       | 28             | 23/       | 28             | 2099/3571         |
| SNC    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CZW---CDC/CDM-    |
| GUJ    | 99/        | 43       |                | 77/       | 41             | 34/       | 39             | 1887/2976         |
| RTR    | 145/       | 44       |                | 127/      | 44             | 110/      | 44             | 591-604 2417/3571 |
| PSV QT | 66 -       |          |                | 66/       | 45 -           | 45        | NSY 237 -2380/ | 49 -2316          |
| SNJ    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CDC/CDM-          |
| GUJ    | 96/        | 44       |                | 42/       | 40             | 30/       | 38             | 1570/2380         |
| BTR    | 123/       | 44       |                | 101/      | 44             | 74/       | 40             | 1887/2380         |
| SNE    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CZW---CDC/CDM-    |
| GUJ    | 130/       | 45       |                | 100/      | 44             | 37/       | 39             | 2417/3571         |
| BST    | 180/       | 45       |                | 148/      | 45             | 108/      | 45             | 588-615 2628/4166 |
| BB     | MIN-A/R    | 35/110   |                | MAXSE-A/R | 20/255         | MAX-A/R   | 15/365         |                   |
| PSV QT | 122 -      | 604/     | 48 -           | 584       | NSY 297 -1785/ | 409 -1737 |                |                   |
| SNF    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CZW---CDC/CDM-    |
| GUJ    | 193/       | 45       |                | 169/      | 45             | 128/      | 45             | 2417/3571         |
| BST    | 247/       | 45       |                | 222/      | 45             | 178/      | 45             | 588-641 2628/4166 |
| BB     | MIN-A/R    | 35/110   |                | MAXSE-A/R | 10/421         | MAX-A/R   | 10/544         |                   |
| PSV QT | 237 -1190/ | 49 -1158 | NSY 552 -2976/ | 547 -2895 |                |           |                |                   |
| SNJ    | ---        | 12KTS    | -----          | 18KTS     | -----          | 24KTS     | -----          | CZW---CDC/CDM-    |
| GUJ    | 187/       | 45       |                | 182/      | 45             | 168/      | 45             | 2417/3571         |
| BST    | 241/       | 45       |                | 235/      | 45             | 221/      | 45             | 588-636 2628/4166 |
| BB     | MIN-A/R    | 35/110   |                | MAXSE-A/R | 10/407         | MAX-A/R   | 10/531         |                   |
| PSV QT | 221 -1190/ | 49 -1158 | NSY 540 -2976/ | 541 -2895 |                |           |                |                   |
| SNH    | ---        | 12KTS    | -----          | 18KTS     | -----          | TD        | -----          | CDC/CDM-          |
| GUJ    | 28/        | 34       |                | 28/       | 34             | 45        |                | 864/ 864          |
| BTR    | 28/        | 34       |                | 28/       | 34             | 45        |                | 946/1158          |
| GUJP   | 28/        | 34       |                | 28/       | 34             | 45        |                | 864/ 864          |
| BTRP   | 28/        | 34       |                | 28/       | 34             | 45        |                | 946/1158          |
| SNI    | 23/        | 34       |                | DD        | 6              | PSV       | 1 - 1          | CDC 1067 CDM 1190 |

05FA/50TS 81032700Z M0/ 20.7/1523/ 81/ 18.5/1518, 101/ 17.6/1516  
 121/ 17.0/1514, 140/ 16.0/1512, 160/ 14.9/1509, 199/ 13.5/1505  
 300/ 11.3/1499, 400/ 9.5/1494, 600/ 5.6/1482, 650/ 5.2/1481  
 700/ 4.8/1481, 800/ 4.1/1479, 1400/ 2.6/1484, 1800/ 2.1/1489  
 2100/ 2.0/1493, 2600/ 1.8/1501, 3000/ 1.5/1507, 5121/ 1.5/1544  
 DRX(3937/ 1183)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(5121)SLD( 0)  
 DP TGT 61 AVG SVL 1506 POD 50.

|        |         |        |       |           |        |         |         |                   |
|--------|---------|--------|-------|-----------|--------|---------|---------|-------------------|
| SNA    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CDC/CDM-          |
| ALL    | 23/     | 34     |       | 23/       | 31     | 22/     | 22      | 942/1286          |
| SNH    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CZW---CDC/CDM-    |
| MD/1   | 11/     | 34     |       | 11/       | 34     | 11/     | 34      | - 1993/3216       |
| MD/2   | 23/     | 28     |       | 23/       | 28     | 23/     | 28      | 1993/3216         |
| SNC    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CZW---CDC/CDM-    |
| GUJ    | 15/     | 34     |       | 15/       | 34     | 15/     | 34      | 1358/2509         |
| BTR    | 17/     | 34     |       | 17/       | 34     | 17/     | 34      | 635-646 17A2/3136 |
| PSV OT | 32 -    | 32/    | 32 -  | 32        | NSY    | 33 -    | 1930/   | 33 -1881          |
| SND    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CDC/CDM-          |
| GUJ    | 12/     | 34     |       | 12/       | 34     | 12/     | 34      | 1067/1881         |
| BTR    | 12/     | 34     |       | 12/       | 34     | 12/     | 34      | 1358/2509         |
| SNE    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CZW---CDC/CDM-    |
| GUJ    | 23/     | 34     |       | 23/       | 34     | 23/     | 34      | 2205/3216         |
| BST    | 21/     | 34     |       | 21/       | 34     | 21/     | 34      | - 2417/3860       |
| BB     | MIN-A/R | /      |       | MAXSE-A/R | /      |         | MAX-A/R | /                 |
| PSV OT | 33 -    | 651/   | 33 -  | 33        | NSY    | 33 -    | 1286/   | 33 -1254          |
| SNF    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CZW---CDC/CDM-    |
| GUJ    | 23/     | 34     |       | 23/       | 34     | 23/     | 34      | 2205/3216         |
| BST    | 21/     | 34     |       | 21/       | 34     | 21/     | 34      | 639-668 2417/3860 |
| BB     | MIN-A/R | 15/336 |       | MAXSE-A/R | 10/462 |         | MAX-A/R | 10/513            |
| PSV OT | 33 -    | 1286/  | 33 -  | 1254      | NSY    | 570 -   | 2573/   | 582 -2509         |
| SNG    | ---     | 12KTS  | ----- | 18KTS     | -----  | 24KTS   | -----   | CZW---CDC/CDM-    |
| GUJ    | 23/     | 34     |       | 23/       | 34     | 23/     | 34      | 2205/3216         |
| RST    | 21/     | 34     |       | 21/       | 34     | 21/     | 34      | 639-666 2417/3860 |
| BB     | MIN-A/R | 15/336 |       | MAXSE-A/R | 10/448 |         | MAX-A/R | 10/493            |
| PSV OT | 33 -    | 1286/  | 33 -  | 685       | NSY    | 550 -   | 2573/   | 545 -1881         |
| SNH    | ---     | 12KTS  | ----- | 18KTS     | -----  | TD----- |         | CDC/CDM-          |
| GUJ    | 45/     | 52     |       | 45/       | 52     | 27      |         | 897/1254          |
| RTR    | 45/     | 52     |       | 45/       | 52     | 27      |         | 989/1254          |
| GUJO   | 45/     | 52     |       | 45/       | 52     | 27      |         | 897/1254          |
| BTQP   | 45/     | 52     |       | 45/       | 52     | 27      |         | 989/1254          |
| SNI    | 43/     | 45     |       | DD        | 45     | PSV     | 1 - 1   | CDC 1015 CDM 1222 |

08SP/FOTS 81032700Z MO/ 19.2/1519/ 17/ 19.2/1520, 18/ 19.2/1520  
 40/ 18.2/1517, 60/ 17.5/1515, 89/ 17.0/1514, 120/ 17.0/1515  
 150/ 16.8/1515, 191/ 16.4/1514, 300/ 15.6/1514, 400/ 14.1/1510  
 510/ 12.0/1505, 600/ 9.1/1496, 700/ 6.6/1488, 800/ 5.0/1483  
 900/ 4.4/1482, 1200/ 3.2/1483, 1600/ 2.5/1487, 1900/ 2.1/1490  
 2400/ 1.8/1497, 3475/ 1.6/1515, 4000/ 1.6/1524, 6000/ 1.6/1561  
 6949/ 1.6/1578  
 DRX(3675/ 3273)GR( 2.0)BL(1/1)WH( 1)WS(12)BD(6949)SLD( 18)  
 DP TGT 79 AVG SVL 1523 POD 50.

|        |         |           |           |           |       |            |           |                  |
|--------|---------|-----------|-----------|-----------|-------|------------|-----------|------------------|
| SNA    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CDC/CDM-         |
| ALL    |         | 1/ 20     |           | 1/ 20     |       | 1/ 16      |           | 853/1286         |
| SNR    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CZW---CDC/CDM-   |
| MD/1   |         | 6/ 27     |           | 6/ 27     |       | 6/ 24      | -         | 1279/2573        |
| MD/2   |         | 16/ 22    |           | 16/ 22    |       | 16/ 22     |           | 1226/2573        |
| SNC    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CZW---CDC/CDM-   |
| GUJ    |         | 11/ 28    |           | 11/ 28    |       | 11/ 26     |           | 1358/2573        |
| BTP    |         | 11/ 28    |           | 11/ 28    |       | 11/ 28     | 646-648   | 1887/3216        |
| PSV OT |         | 17 -      | 17/ 32 -  | 32 NSY    |       | 17 -1930/  | 33 -1881  |                  |
| SND    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CDC/CDM-         |
| GUJ    |         | 9/ 28     |           | 9/ 27     |       | 9/ 23      |           | 1279/1930        |
| BTR    |         | 9/ 28     |           | 9/ 28     |       | 9/ 27      |           | 1464/1930        |
| SNE    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CZW---CDC/CDM-   |
| GUJ    |         | 17/ 28    |           | 17/ 28    |       | 17/ 23     |           | 1782/3216        |
| HST    |         | 12/ 28    |           | 12/ 28    |       | 12/ 28     | 632-661   | 1993/3216        |
| BB     | MIN-A/R | /         |           | MAXSE-A/R | /     | MAX-A/R    | /         |                  |
| PSV OT |         | 17 -      | 17/ 33 -  | 33 NSY    |       | 17 -1286/  | 33 -1254  |                  |
| SNF    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CZW---CDC/CDM-   |
| GUJ    |         | 17/ 28    |           | 17/ 28    |       | 17/ 28     |           | 1782/3216        |
| BST    |         | 12/ 28    |           | 12/ 28    |       | 12/ 28     | 631-675   | 1993/3216        |
| BB     | MIN-A/R | /         |           | MAXSE-A/R | /     | MAX-A/R    | /         |                  |
| PSV OT |         | 17 -1286/ | 33 -      | 682 NSY   |       | 453 -2573/ | 450 -1881 |                  |
| SNG    | ---     | 12KTS     | -----     | 18KTS     | ----- | 24KTS      | -----     | CZW---CDC/CDM-   |
| GUJ    |         | 17/ 28    |           | 17/ 28    |       | 17/ 28     |           | 1782/3216        |
| BST    |         | 12/ 28    |           | 12/ 28    |       | 12/ 28     | 631-672   | 1993/3216        |
| BB     | MIN-A/R | /         |           | MAXSE-A/R | /     | MAX-A/R    | /         |                  |
| PSV OT |         | 17 -      | 689/ 33 - | 672 NSY   |       | 17 -1930/  | 33 -1881  |                  |
| SNH    | ---     | 12KTS     | -----     | 18KTS     | ----- | TD-----    | -----     | CDC/CDM-         |
| GUJ    |         | 22/ 57    |           | 22/ 57    |       | 45         |           | 814/1254         |
| BTR    |         | 22/ 57    |           | 22/ 57    |       | 45         |           | 914/1254         |
| GUJP   |         | 22/ 57    |           | 22/ 56    |       | 45         |           | 814/1254         |
| STBP   |         | 22/ 57    |           | 22/ 57    |       | 45         |           | 914/1254         |
| SNI    |         | 22/ 22    |           | DD 5      |       | PSV 1 - 1  |           | CDC 971 CDM 1286 |

09SM/FOTS 81032700Z MO/ 18.0/1515/ 19/ 18.0/1515, 20/ 18.0/1515  
 40/ 12.8/1499, 60/ 9.4/1488, 80/ 7.1/1480, 120/ 4.3/1469  
 170/ 2.8/1463, 220/ 1.9/1460, 300/ .8/1457, 400/ .4/1457  
 500/ .3/1458, 600/ .2/1459, 700/ .2/1461, 2195/ .1/1485  
 DRX(3942/-1748)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2195)SLD( 20)  
 DP TGT 81 AVG SVL 1470 POD 50.

|        |         |       |       |           |       |        |         |                   |
|--------|---------|-------|-------|-----------|-------|--------|---------|-------------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CDC/CDM-          |
| ALL    | 23/     | 16    |       | 23/       | 15    | 21/    | 1       | 944/ 944          |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| MD/1   | 93/     | 23    |       | 74/       | 23    | 42/    | 22      | - 2787/2787       |
| MD/2   | 23/     | 17    |       | 23/       | 17    | 23/    | 17      | 2787/2787         |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUID   | 92/     | 27    |       | 77/       | 24    | 61/    | 23      | 2417/2417         |
| RTR    | 139/    | 27    |       | 94/       | 27    | 94/    | 27      | - 2998/2998       |
| PSV QT | 218 -   | 218/  | 30 -  | 30        | NSY   | 473 -  | 473/    | 411 - 411         |
| SND    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CDC/CDM-          |
| GUID   | 89/     | 24    |       | 70/       | 23    | 30/    | 22      | 1782/1782         |
| RTR    | 95/     | 24    |       | 94/       | 24    | 74/    | 24      | 2099/2099         |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUID   | 100/    | 28    |       | 93/       | 28    | 60/    | 23      | 2998/2998         |
| BST    | 174/    | 28    |       | 142/      | 28    | 96/    | 28      | - 3210/3210       |
| BB     | MIN-A/R | 35/   | 42    | MAXSE-A/R | 0/    | 211    | MAX-A/R | 0/261             |
| PSV QT | 404 -   | 404/  | 211 - | 211       | NSY   | 905 -  | 905/    | 627 - 627         |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUID   | 184/    | 28    |       | 163/      | 28    | 100/   | 28      | 2998/2998         |
| BST    | 193/    | 28    |       | 193/      | 28    | 171/   | 28      | - 3210/3210       |
| BB     | MIN-A/R | 15/   | 88    | MAXSE-A/R | 0/    | 211    | MAX-A/R | 0/261             |
| PSV QT | 683 -   | 683/  | 441 - | 441       | NSY   | 1464 - | 1464/   | 1015 -1015        |
| SNG    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-    |
| GUID   | 179/    | 28    |       | 175/      | 28    | 162/   | 28      | 2998/2998         |
| BST    | 193/    | 28    |       | 193/      | 28    | 193/   | 28      | - 3210/3210       |
| BB     | MIN-A/R | 15/   | 88    | MAXSE-A/R | 0/    | 211    | MAX-A/R | 0/261             |
| PSV QT | 674 -   | 674/  | 417 - | 417       | NSY   | 1358 - | 1358/   | 1015 -1015        |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD     | -----   | CDC/CDM-          |
| GUID   | 17/     | 21    |       | 15/       | 16    | 45     |         | 729/ 729          |
| RTR    | 17/     | 21    |       | 17/       | 21    | 45     |         | 831/ 831          |
| GUIDP  | 17/     | 21    |       | 10/       | 9     | 45     |         | 729/ 729          |
| RTRP   | 17/     | 21    |       | 16/       | 19    | 45     |         | 831/ 831          |
| SNI    | 23/     | 17    |       | DD        | 5     | PSV    | 7 - 7   | CDC 1015 CDM 1015 |

58FA/FOTS 81032700Z M0/ 10.4/1492/ 28/ 10.4/1492, 29/ 10.4/1492  
 60/ 8.9/1487, 80/ 8.8/1487, 182/ 8.8/1489  
 DRX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 29)  
 DP TGT 90 AVG SVL 1488 POD 50.

|        |         |       |       |           |       |         |         |                 |
|--------|---------|-------|-------|-----------|-------|---------|---------|-----------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CDC/CDM-        |
| ALL    | 1/      | 1     |       | 1/        | 1     | 1/      | 1       | 464/ 464        |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| MD/1   | 100/    | 47    |       | 89/       | 47    | 81/     | 47      | - 772/ 772      |
| MD/2   | 1/      | 1     |       | 1/        | 1     | 1/      | 1       | 766/ 766        |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUD    | 112/    | 85    |       | 95/       | 64    | 88/     | 59      | 712/ 712        |
| BTR    | 163/120 |       |       | 144/      | 95    | 126/    | 92      | - 843/ 843      |
| PSV QT | 112 -   | 112/  | 82 -  | 82        | NSY   | 321 -   | 321/    | 249 - 249       |
| SND    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CDC/CDM-        |
| GUD    | 95/     | 60    |       | 88/       | 59    | 76/     | 51      | 574/ 574        |
| BTR    | 122/    | 90    |       | 99/       | 60    | 89/     | 59      | 652/ 652        |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUD    | 149/    | 98    |       | 101/      | 66    | 74/     | 49      | 919/ 919        |
| BST    | 191/146 |       |       | 160/101   |       | 99/     | 64      | - 954/ 954      |
| BB     | MIN-A/R | 5/    | 4     | MAXSE-A/R | 0/    | 54      | MAX-A/R | 0/106           |
| PSV QT | 148 -   | 148/  | 99 -  | 99        | NSY   | 369 -   | 369/    | 290 - 290       |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUD    | 198/151 |       |       | 177/128   |       | 142/    | 95      | 919/ 919        |
| BST    | 262/202 |       |       | 226/163   |       | 179/137 |         | - 954/ 954      |
| BB     | MIN-A/R | 5/    | 4     | MAXSE-A/R | 0/    | 54      | MAX-A/R | 0/106           |
| PSV QT | 272 -   | 272/  | 209 - | 209       | NSY   | 545 -   | 545/    | 443 - 443       |
| SNG    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS   | -----   | CZW---CDC/CDM-  |
| GUD    | 193/147 |       |       | 187/143   |       | 178/129 |         | 919/ 919        |
| BST    | 250/181 |       |       | 243/178   |       | 229/165 |         | - 954/ 954      |
| BB     | MIN-A/R | 5/    | 4     | MAXSE-A/R | 0/    | 54      | MAX-A/R | 0/106           |
| PSV QT | 264 -   | 264/  | 188 - | 188       | NSY   | 531 -   | 531/    | 435 - 435       |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD      | -----   | CDC/CDM-        |
| GUD    | 17/167  |       |       | 17/130    |       | 25      |         | 397/ 397        |
| BTR    | 17/184  |       |       | 17/167    |       | 25      |         | 424/ 424        |
| GUHP   | 48/188  |       |       | 48/122    |       | 20      |         | 408/ 408        |
| BTRP   | 48/197  |       |       | 48/186    |       | 20      |         | 429/ 429        |
| SNI    | 50/121  |       |       | DD        | 20    | PSV     | 11 - 11 | CDC 386 CDM 386 |

58WI/FOTS 81032700Z M0/ 5.5/1473/ 19/ 5.5/1473, 20/ 5.5/1473  
 40/ 5.8/1475, 60/ 5.6/1474, 182/ 5.6/1477  
 DRX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 182)SLD( 40)  
 DP TGT 101 AVG SVL 1475 POD 50.

|        |         |       |       |           |       |       |         |                 |
|--------|---------|-------|-------|-----------|-------|-------|---------|-----------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CDC/CDM-        |
| ALL    | 1/      | 1     |       | 1/        | 1     | 1/    | 1       | 482/ 487        |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CZW---CDC/CDM-  |
| MD/1   | 55/     | 84    |       | 55/       | 84    | 51/   | 84      | - 941/ 974      |
| MD/2   | 1/      | 84    |       | 1/        | 84    | 1/    | 83      | 938/ 974        |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CZW---CDC/CDM-  |
| GUD    | 112/    | 84    |       | 111/      | 84    | 108/  | 84      | 900/ 974        |
| BTR    | 201/    | 193   |       | 122/      | 187   | 118/  | 177     | - 1120/1169     |
| PSV QT | 75 -    | 194/  | 182 - | 182       | NSY   | 509 - | 779/    | 579 - 777       |
| SND    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CDC/CDM-        |
| GUD    | 111/    | 84    |       | 107/      | 84    | 48/   | 84      | 682/ 682        |
| BTR    | 120/    | 119   |       | 112/      | 84    | 108/  | 84      | 753/ 779        |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CZW---CDC/CDM-  |
| GUD    | 121/    | 188   |       | 112/      | 84    | 40/   | 84      | 1266/1266       |
| BST    | 216/    | 200   |       | 122/      | 190   | 111/  | 84      | - 1364/1364     |
| BR     | MIN-A/R | 42/   | 20    | MAXSE-A/R | 0/    | 63    | MAX-A/R | 0/ 90           |
| PSV QT | 137 -   | 194/  | 186 - | 186       | NSY   | 434 - | 682/    | 481 - 647       |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CZW---CDC/CDM-  |
| GUD    | 220/    | 201   |       | 210/      | 198   | 119/  | 185     | 1266/1266       |
| BST    | 310/    | 218   |       | 231/      | 218   | 212/  | 199     | - 1364/1364     |
| BR     | MIN-A/R | 42/   | 20    | MAXSE-A/R | 0/    | 63    | MAX-A/R | 0/ 90           |
| PSV QT | 320 -   | 487/  | 374 - | 518       | NSY   | 701 - | 974/    | 775 -1036       |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS | -----   | CZW---CDC/CDM-  |
| GUD    | 217/    | 200   |       | 214/      | 200   | 211/  | 198     | 1266/1266       |
| BST    | 307/    | 218   |       | 303/      | 218   | 232/  | 218     | - 1364/1364     |
| BR     | MIN-A/R | 42/   | 20    | MAXSE-A/R | 0/    | 63    | MAX-A/R | 0/ 90           |
| PSV QT | 313 -   | 487/  | 311 - | 388       | NSY   | 688 - | 974/    | 714 -1036       |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD    | -----   | CDC/CDM-        |
| GUD    | 89/     | 128   |       | 87/       | 86    | 25    |         | 488/ 488        |
| BTR    | 89/     | 161   |       | 89/       | 89    | 25    |         | 488/ 488        |
| GUDP   | 95/     | 130   |       | 90/       | 78    | 20    |         | 487/ 487        |
| BTRD   | 95/     | 145   |       | 94/       | 87    | 20    |         | 487/ 487        |
| SNI    | 89/     | 72    |       | DD        | 20    | PSV   | 1 - 1   | CDC 487 CDM 487 |

60SP/FOTS 81032700Z M0/ 17.8/1519/ 19/ 17.8/1519, 20/ 17.8/1519  
 60/ 14.9/1511, 100/ 13.8/1508, 120/ 13.5/1508, 150/ 13.5/1508  
 300/ 13.8/1513, 400/ 13.7/1514, 500/ 13.7/1516, 560/ 13.6/1516  
 600/ 13.5/1517, 900/ 13.0/1520, 1100/ 13.0/1523, 2700/ 13.0/1550  
 DRX( 0/ 0)GR( 2.0)BL(1/1)WH( 1)WS(13)BD(2700)SLD( 20)  
 DP TGT 81 AVG SVL 1528 POD 50.

|        |         |       |       |           |       |        |         |                 |
|--------|---------|-------|-------|-----------|-------|--------|---------|-----------------|
| SNA    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CDC/CDM-        |
| ALL    | 22/     | 15    |       | 22/       | 15    | 21/    | 14      | 1014/1014       |
| SNR    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-  |
| MD/1   | 29/     | 23    |       | 29/       | 23    | 29/    | 23      | - 2029/2029     |
| MD/2   | 22/     | 17    |       | 22/       | 17    | 22/    | 17      | 2029/2029       |
| SNC    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-  |
| GD     | 74/     | 27    |       | 64/       | 26    | 46/    | 23      | 2029/2029       |
| RTR    | 109/    | 27    |       | 97/       | 27    | 84/    | 27      | - 2368/2368     |
| PSV QT | 66 -    | 66/   | 32 -  | 32        | NSY   | 995 -  | 1417/   | 727 -1288       |
| SND    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CDC/CDM-        |
| GD     | 69/     | 24    |       | 51/       | 23    | 25/    | 23      | 1691/1691       |
| RTR    | 88/     | 24    |       | 69/       | 24    | 55/    | 24      | 1691/1691       |
| SNE    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-  |
| GD     | 98/     | 28    |       | 70/       | 28    | 26/    | 23      | 2368/2368       |
| BST    | 135/    | 28    |       | 106/      | 28    | 67/    | 27      | - 2706/2706     |
| BB     | MIN-A/R | 35/   | 71    | MAXSE-A/R | 15/   | 238    | MAX-A/R | 15/286          |
| PSV QT | 48 -    | 48/   | 32 -  | 32        | NSY   | 984 -  | 1063/   | 699 - 966       |
| SNF    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-  |
| GD     | 142/    | 28    |       | 123/      | 28    | 93/    | 28      | 2368/2368       |
| BST    | 181/    | 28    |       | 163/      | 28    | 130/   | 28      | - 2706/2706     |
| BB     | MIN-A/R | 35/   | 71    | MAXSE-A/R | 15/   | 338    | MAX-A/R | 15/367          |
| PSV QT | 708 -   | 708/  | 644 - | 644       | NSY   | 1570 - | 1771/   | 1358 -1611      |
| SNG    | ---     | 12KTS | ----- | 18KTS     | ----- | 24KTS  | -----   | CZW---CDC/CDM-  |
| GD     | 136/    | 28    |       | 134/      | 28    | 124/   | 28      | 2368/2368       |
| BST    | 177/    | 28    |       | 174/      | 28    | 164/   | 28      | - 2706/2706     |
| BB     | MIN-A/R | 35/   | 71    | MAXSE-A/R | 15/   | 338    | MAX-A/R | 15/365          |
| PSV QT | 708 -   | 708/  | 33 -  | 644       | NSY   | 1464 - | 1771/   | 1226 -1611      |
| SNH    | ---     | 12KTS | ----- | 18KTS     | ----- | TD     | -----   | CDC/CDM-        |
| GD     | 17/     | 230   |       | 17/       | 187   | 45     |         | 879/ 966        |
| HTR    | 17/     | 267   |       | 17/       | 226   | 45     |         | 957/ 966        |
| GDND   | 17/     | 190   |       | 17/       | 152   | 45     |         | 879/ 966        |
| HTRP   | 17/     | 233   |       | 17/       | 189   | 45     |         | 957/ 966        |
| SNI    | 24/     | 18    |       | DD        | 5     | PSV    | 1 - 1   | CDC 966 CDM 966 |

02HC/FOTS 81032700Z MO/ 20.7/1523/ 2700/ 13.0/1550,\*\*\*\*\*/ 0.0/\*\*\*\*  
 ORX(NA HALF CH)GR( 2.0)BL(1/1)WH( 0)WS( 8)BD(2700)SLD(2700)  
 DP TGT 305 AVG SVL 1527 POD 50.

|       |          |          |           |         |         |         |           |                 |
|-------|----------|----------|-----------|---------|---------|---------|-----------|-----------------|
| SNA   | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CDC/CDM-        |
| ALL   | 65/      | 1        |           | 39/     | 1       | 25/     | 1         | 670/ 670        |
| SNR   | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CZW---CDC/CDM-  |
| MD/1  | 170/124  |          |           | 138/ 97 |         | 113/ 70 |           | - 2099/2099     |
| MD/2  | 107/ 1   |          |           | 102/ 1  |         | 77/ 1   |           | 2099/2099       |
| SNC   | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CZW---CDC/CDM-  |
| GUJ   | 174/125  |          |           | 153/104 |         | 120/ 84 |           | 1782/1782       |
| BTR   | 244/267  |          |           | 216/249 |         | 185/237 |           | - 2311/2311     |
| PSV   | QT 170 - | 170/ 92  | -         | 92      | NSY     | 572 -   | 572/ 733  | - 733           |
| SD    | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CDC/CDM-        |
| GUJ   | 148/124  |          |           | 119/ 97 |         | 101/ 67 |           | 1015/1015       |
| BTR   | 143/242  |          |           | 155/133 |         | 120/100 |           | 1358/1358       |
| SNE   | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CZW---CDC/CDM-  |
| GUJ   | 238/239  |          |           | 185/105 |         | 121/ 62 |           | 2522/2522       |
| BST   | 325/277  |          |           | 269/249 |         | 203/113 |           | - 2787/2787     |
| BB    | MIN-A/R  | 42/ 49   | MAXSE-A/R | 42/ 71  | MAX-A/R | 15/301  |           |                 |
| PSV   | QT 259 - | 259/ 122 | -         | 122     | NSY     | 673 -   | 673/ 736  | - 736           |
| SNF   | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CZW---CDC/CDM-  |
| GUJ   | 349/290  |          |           | 306/266 |         | 234/237 |           | 2522/2522       |
| BST   | 436/437  |          |           | 402/431 |         | 320/275 |           | - 2787/2787     |
| BB    | MIN-A/R  | 42/ 49   | MAXSE-A/R | 25/137  | MAX-A/R | 15/366  |           |                 |
| PSV   | QT 507 - | 507/ 450 | -         | 450     | NSY     | 1015 -  | 1015/1226 | -1226           |
| SNG   | ---      | 12KTS    | -----     | 18KTS   | -----   | 24KTS   | -----     | CZW---CDC/CDM-  |
| GUJ   | 339/283  |          |           | 329/278 |         | 305/266 |           | 2522/2522       |
| BST   | 432/437  |          |           | 429/437 |         | 400/430 |           | - 2787/2787     |
| BB    | MIN-A/R  | 42/ 49   | MAXSE-A/R | 25/137  | MAX-A/R | 15/366  |           |                 |
| PSV   | QT 478 - | 478/ 437 | -         | 437     | NSY     | 967 -   | 967/1120  | -1120           |
| SNH   | ---      | 12KTS    | -----     | 18KTS   | -----   | TD      | -----     | CDC/CDM-        |
| GUJ   | 167/131  |          |           | 109/101 |         | 45      |           | 876/ 876        |
| BTR   | 181/148  |          |           | 165/124 |         | 45      |           | 942/ 942        |
| GUJDP | 161/116  |          |           | 94/ 86  |         | 45      |           | 876/ 876        |
| RTRP  | 169/138  |          |           | 116/110 |         | 45      |           | 942/ 942        |
| SNI   | 86/ 87   |          |           | DD 45   |         | PSV 1 - | 1         | CDC 939 CDM 939 |

02NG/FOTS 81032700Z M0/ 20.7/1523/ 400/ 16.7/1516,\*\*\*\*\*/ 0.0/\*\*\*\*  
 DRX(NA SHALLOW)GR( 2.0)BL(1/1)WH( 1)WS(13)BD( 400)SLD( 0)  
 DP TGT 61 AVG SVL 1519 POD 50.

|        |                |                 |                    |                     |
|--------|----------------|-----------------|--------------------|---------------------|
| SNA    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CDC/CDM-       |
| ALL    | 22/ 21         | 22/ 21          | 22/ 21             | 932/ 932            |
| SNR    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CZW---CDC/CDM- |
| MD/1   | 211/223        | 202/153         | 193/ 43            | - 1676/1676         |
| MD/2   | 198/ 19        | 20/ 19          | 20/ 19             | 1676/1676           |
| SNC    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CZW---CDC/CDM- |
| GUD    | 210/221        | 204/154         | 199/148            | 1279/1279           |
| BTR    | 386/333        | 380/325         | 372/228            | - 1782/1782         |
| PSV QT | 200 - 200/ 153 | - 153           | NSY 878 - 878/ 855 | - 855               |
| SND    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CDC/CDM-       |
| GUD    | 210/219        | 201/152         | 170/ 56            | 954/ 954            |
| BTR    | 378/321        | 211/224         | 202/153            | 1173/1173           |
| SNE    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CZW---CDC/CDM- |
| GUD    | 380/326        | 208/156         | 34/ 53             | 1993/1993           |
| BST    | 391/410        | 383/331         | 207/155            | - 2205/2205         |
| BB     | MIN-A/R 42/ 7  | MAXSE-A/R 0/188 | MAX-A/R 0/209      |                     |
| PSV QT | 377 - 377/ 220 | - 220           | NSY 924 - 924/ 933 | - 933               |
| SNF    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CZW---CDC/CDM- |
| GUD    | 392/411        | 390/402         | 378/317            | 1993/1993           |
| BST    | 392/414        | 392/414         | 391/407            | - 2205/2205         |
| BB     | MIN-A/R 0/ 74  | MAXSE-A/R 0/188 | MAX-A/R 0/209      |                     |
| PSV QT | 878 - 878/ 855 | - 855           | NSY 932 - 932/ 947 | - 947               |
| SNG    | ---12KTS-----  | 18KTS-----      | 24KTS-----         | -----CZW---CDC/CDM- |
| GUD    | 391/410        | 391/409         | 390/403            | 1993/1993           |
| BST    | 392/414        | 392/414         | 392/414            | - 2205/2205         |
| BB     | MIN-A/R 0/ 74  | MAXSE-A/R 0/188 | MAX-A/R 0/209      |                     |
| PSV QT | 873 - 873/ 681 | - 681           | NSY 931 - 931/ 947 | - 947               |
| SNH    | ---12KTS-----  | 18KTS-----      | TD-----            | -----CDC/CDM-       |
| GUD    | 132/159        | 114/131         | 45                 | 1226/1226           |
| BTR    | 132/167        | 132/155         | 45                 | 1358/1358           |
| GUDP   | 132/147        | 51/ 83          | 45                 | 1226/1226           |
| BTOP   | 132/164        | 129/141         | 45                 | 1358/1358           |
| SNI    | 72/ 84         | DD 45           | PSV 1 - 1          | CDC 1358 CDM 1358   |

**APPENDIX P**

**UPDATE IDENT HISTORY FOR PROGRAM USER**

|          |   |   |   |   | USER 7.0 UPDATE SETS |                |            | USER 17.0 UPDATE SETS |                  |                 |
|----------|---|---|---|---|----------------------|----------------|------------|-----------------------|------------------|-----------------|
|          |   |   |   |   | 7.1*                 | 7.3<br>(=17.0) | 17.8       | 17.9                  | 17.12<br>(=19.0) |                 |
|          |   |   |   |   | COMDECKS             |                |            |                       |                  |                 |
|          |   |   |   |   | \$LARAYU             |                | \$LARAY02  |                       | \$LARAY02        |                 |
|          |   |   |   |   | \$NOYSU              |                |            | \$NOYSU*02            | \$NOYSU*02       |                 |
|          |   |   |   |   | \$STARAYU            |                | \$STARAY02 |                       | \$STARAY02       |                 |
|          |   |   |   |   | \$UARAYU             |                |            |                       |                  |                 |
|          |   |   |   |   | DECKS                |                |            |                       |                  |                 |
|          |   |   |   |   |                      |                |            |                       |                  |                 |
|          |   |   |   |   |                      |                |            |                       |                  |                 |
| \$LARAYU | X | X | X | X | USER                 | USER*08        | USER*11    | USER*12               | USER*13          | USER*12,USER*13 |
|          | X |   |   |   | LINEU                |                |            | LINEU*04              |                  | LINEU*04        |
|          |   |   | X |   | TITLEU               |                |            | TITLEU*04             |                  | TITLEU*04       |
|          |   |   |   | X | UNSORTU              |                |            | UNSORTU05             |                  | UNSORTU05       |

\* Indicates an update set that has not been implemented. Idents may change before implementation.

**APPENDIX Q**

**UPDATE IDENT HISTORY FOR PROGRAM POSTSORT**

| POSTSORT 5.0<br>UPDATE SETS |   |   |   | POSTSORT 17.0 UPDATE SETS |             |            |                      |
|-----------------------------|---|---|---|---------------------------|-------------|------------|----------------------|
| COMDECKS                    |   |   |   | 5.3<br>(=17.0)            | 17.8        | 17.9       | 17.12<br>(=19.0)     |
| \$LARAYP                    |   |   |   |                           | \$LARAYP02  |            | \$LARAYP02           |
| \$NOYSP                     |   |   |   |                           |             | \$NOYSP*02 | \$NOYSP*02           |
| \$STARAYP                   |   |   |   |                           | \$STARAYP02 |            | \$STARAYP02          |
| \$UARAYP                    |   |   |   |                           |             |            |                      |
| DECKS                       |   |   |   |                           |             |            |                      |
| POSTSRT                     |   |   |   | POSTSRT08                 | POSTSRT09   | POSTSRT10  | POSTSRT09, POSTSRT10 |
| LINEP                       |   |   |   |                           | LINEP*04    |            | LINEP*04             |
| NOISEP                      |   |   |   |                           |             | NOISEP*04  | NOISEP*04            |
| TITLEP                      |   |   |   |                           | TITLEP*04   |            | TITLEP*04            |
| UNSORTP                     |   |   |   |                           | UNSORTP05   |            | UNSORTP05            |
|                             |   |   |   |                           |             |            |                      |
| \$LARAYP                    | X | X |   |                           |             |            |                      |
| \$NOYSP                     |   | X |   |                           |             |            |                      |
| \$STARAYP                   |   |   | X |                           |             |            |                      |
| \$UARAYP                    |   |   |   |                           |             |            |                      |

APPENDIX R

UPDATE IDENT HISTORY FOR PROGRAM SHARPS



\* Indicates an update set that has not been implemented. Idents may change before implementation.

## UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                            | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                    |
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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><b>This report documents a series of four update sets prepared for the SHARPS-III model and the SHARPS-III preprocessor at the Naval Ocean Research and Development Center (NORDA) and the Fleet Numerical Oceanography Center (FNOC). The first update, which was incorporated in July 1982, reduced the length of the SHARPS-III output message by eliminating blank lines. The second modification added a capability to generate active sonobuoy predictions. The remaining two sets changed the method of determining self-noise for hull mounted sonars,</b> |                                            |                                                                |

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and altered the effective ray angles at the sonar and surface used in computing surface reverberation from surface ducted paths. The latter three updates were prepared for implementation in the scheduled 01 Oct 82 SHARPS-III update. Included as appendices to this report are sample SHARPS-III outputs demonstrating the effects of these modifications and listings of the relevant update cards.

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