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NRL Memo 56-XXO

To : 5000

From : 5620

Via : 5600

Subject : NIPBSA, NRL support of

Reference : (a) Air Task AIR538001/6521/W3606A00
(b) NRL Memo 56-XX1
(c) NRL Stub 56- -68
(d) NRL Memo 56-XX2
(e) NRL Stub 56- -68

1. One of the requirements of reference (a) is that NRL must improve the present operating capabilities of the NIPSSA (Naval Intelligence Processing System Support Activity) ocean surveillance intelligence system by incorporating into the present system ocean surveillance data from three previously unused sensor systems: the BULLSEYE HF/DF System, the RASUR Moon Bounce System, and current satellite acquired and/or relayed intercept information (abbreviated SATII for the purposes of this memorandum). Each of these three systems is now under the technical direction or guidance of NRL or NRL directed personnel.

2. In order to insert the BULLSEYE, RASUR and SATII systems data into the NIPSSA useable data base, the following several objectives must be accomplished:

- a) The exact function of each system, the data processing algorithms, the magnitude of the data available, and the individual case, as well as general system, estimates of accuracy and precision must be defined;
- b) The optimum data transfer formats from each system into the NIPSSA data base under different NIPSSA requirements must be determined;
- c) The optimum request and data formats from NIPSSA to each system under a variety of expected conditions must also be determined;
- d) All interfaces between the sensor systems and NIPSSA must be specified;

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- e) The manner of integrating and correlating the incoming data from the three (3) "new" sensor systems into the data now being received from twenty two (22) existing sensor systems must be mathematically defined.
3. There are at least two other means of improving the NIPSSA operating capabilities for which NRL has experience and/or made unique contributions. These are:
- a) The complete study of the analysis procedures by means of which data is extracted from the NIPSSA data base with the goal of replacing those routine, and frequently time-consuming, manual functions with automated heuristic programs which perform the same analytic processes as the analyst thereby freeing him for more sophisticated analysis requirements; and,
- b) The incorporating of the BULLSEYE communication error correcting advances into first the communication links between NIPSSA and the external sensor systems and between NIPSSA and its users, then second into the difficult problem of ^{insuring} secure operating systems in an environment characterized by various levels of sensitivity of information and variously "ticketed" users.
4. Examination of the above objectives indicates a natural division into four distinct areas - the first part which is primarily concerned with the generation of the data by the external sensor systems, a second part which is primarily concerned with the receipt and integration of the data into the NIPSSA system, a third part which is concerned with the automation of basic manual functions, and the fourth which is concerned with the verification of access and accuracy of the data transferred. The level of effort required to accomplish these tasks is quite high. A portion of the effort is funded by reference (a) which provides for an effort of between 9 and 10 man-years during the next fiscal year. An NRL commitment of its personnel to this

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level of effort would not seem to be consistent with either NRL policy or the efficient usage of the NRL personnel with experience with the BULLSEYE, RASUR and/or SATII system. An NRL commitment to the close supervision and guidance of contractors with experience in these different areas, are appropriately ticketed and have other contracts ~~with~~ ^{concerning} these systems and who can advantageously use the NRL experience with these three systems is, however, clearly consistent with both of the forgoing reservations.

5. The following plan is therefore proposed. The natural division of the objectives be formed into three separate, but complementary, work efforts. Of these, two would be pursued under contract, while the third would be developed by NRL.

- a) References (b) and (c) are for ~~the study on~~ the generation of the data by the BULLSEYE, RASUR and SATII sensor systems, and the incorporation of previously conducted analytic studies of the analyst procedures into heuristic algorithms, ^{for the NIPSSA system}
- b) References (d) and (e) are for the receipt and integration of the data into the NIPSSA system, and
- c) The fourth area concerning error correction and secure operating systems will be developed by NRL.

Close guidance of the efforts by NRL will insure a minimum of overlap between the separate areas, ~~while~~ ^{the} feeding into each the experience of its personnel with the three special sensor systems on a timely basis, and insure that the requirements of reference (a) are implemented in-so-far as possible.

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To

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From

: 5622 ~~56~~ 20

Via

: 5600

Subject : Generation of Data by ^{the} BULLSEYE, RASUR and SATII systems for NIPSSA and the development of heuristic algorithms for the NIPSSA system, Contract for

Reference : (a) NRL Memo 56-XX0
(b) NRL Stub 56- -68

1. Reference (a) describes the planned approach to the NRL support of the NIPSSA ocean surveillance intelligence system.
2. This memorandum discusses the particular requirements of the contract dealing with the generation of the data by the BULLSEYE, RASUR and SATII sensor systems for NIPSSA and the development of heuristic algorithms for the NIPSSA system. The following is a summary of these requirements:
 - a) The RASUR and SATII systems will be analyzed, with particular emphasis on their exact functions, data processing algorithms, data capacity and estimates of their timeliness, accuracy and precision of the individual data cases and the general system;
 - b) Both of these systems and the NIPSSA requirements will be analyzed to determine that optimum set of data formats for the transfer of data into and out of the RASUR and SATII systems which is most consistent with ~~present~~ present and projected equipment configurations and taskings of these external sensors;
 - c) The data formats determined to be optimum for the SATII system will be programmed and implemented into that system;
and
 - d) The results of previous analytic studies of the analysis functions on the NIPSSA data base will be implemented into algorithmic form.
3. It is recommended that reference (b) be approved.

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From

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Via

: 5600

Subject : Receipt and Integration of external sensor data into the
NIPSSA system, Contract for

Reference : (a) NRL Memo 56-XX0
(b) NRL Stub 56- -68

1. Reference (a) describes the planned approach to the NRL support of the NIPSSA ocean surveillance intelligence system.
2. This memorandum discusses the particular requirements of the contract dealing with the receipt and integration of the external sensor data into the NIPSSA system. The following is a summary of these requirements:
 - a) The existing twenty two (22) sensor systems now supplying data to the NIPSSA system shall be ^{analyzed} specified, with particular emphasis on their exact functions, data processing algorithms, data capacity and estimates of the timeliness, accuracy and precision of the individual data cases and the general system;
 - b) Both the NIPSSA system and the three new systems, BULLSEYE, RASUR and SATII, will be analyzed to determine that optimum set of data formats for the transfer of data into and out of the NIPSSA data base under different NIPSSA requirements which is most consistent with the present system configuration as well as the next equipment generation;
and
 - c) Mathematical models and implementation algorithms for the correlation of the data output of all twenty five (25) external sensor systems into a common NIPSSA data base with emphasis on the accuracy, precision, timeliness and retrievability of the combined data will be developed.
3. It is recommended that reference (b) be approved.

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