



**TAE G**

**TRAINING  
ANALYSIS  
AND  
EVALUATION  
GROUP**

**TECHNICAL REPORT NO. 83**

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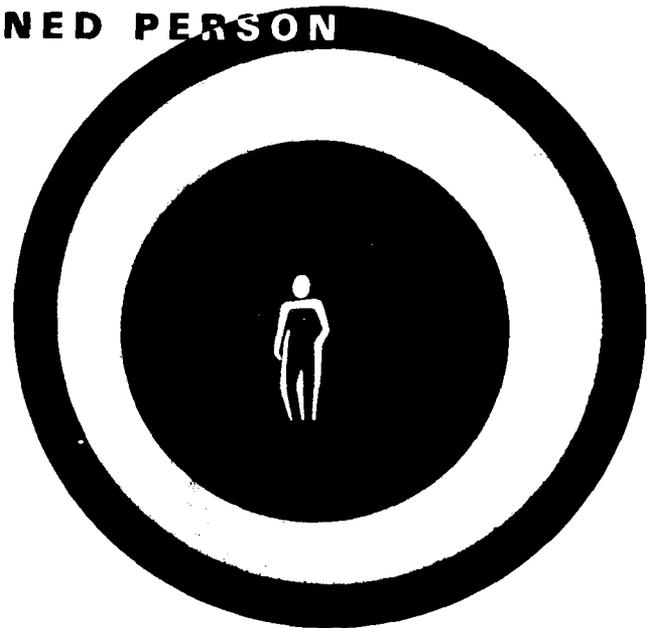
**DEVELOPMENT AND TEST  
OF A COMPUTER READABILITY  
EDITING SYSTEM (GRES)**

**MARCH 1980**

AD A096879

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ORLANDO, FLORIDA 32813**



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S N 0102- LF-014-6601

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TAEG Report No. 83

ACKNOWLEDGMENTS

Many individuals from a variety of government agencies provided support during the conduct of this study. We specifically want to acknowledge the support provided by the following people and their organizations.

CDR Charles Corkins, Jr., Chief of Naval Education and Training, N-532, provided continued support of the Training Analysis and Evaluation Group's (TAEG) readability project, which included the development of the computer readability editing system.

Mr. Kent Huff, Navy Personnel Research and Development Center, San Diego, California, provided a number of word lists, and Dr. Robert Wisher of the same organization provided helpful suggestions.

Computer tapes containing text of Navy technical manuals were provided by the following:

- Mr. Kenneth Radcliff of the Naval Ship Weapon Systems Engineering Station, Port Hueneme, California
- Mr. J. H. Jackson of the Technical Review and Update of Maintenance Publications Systems, Jacksonville, Florida
- Ms. Mary Jones of the Naval Institute, Annapolis, Maryland.

Many Navy personnel helped develop the technical word lists by serving as subject matter experts. These include: CWO-2 Mixon, ADC Bessete, AZC Taylor, and AT1 Mayo of HSI, NAS Jacksonville, Florida; MMCS Wannamaker, MM2 Brumm, MM1 Harrison, YNC Penberthy, YN2 Montville, and YN2 Bell of the Recruit Training Command, Orlando, Florida.

Mr. E. S. Psarakis, Mr. Paul Stankovich, and Ms. Nancy S. Hull of the Navy Data Automation Facility, Orlando, Florida, provided computer services.

Ms. Dorothy Nicewarner of the Army's Adjutant General Center, Publications Directorate, Washington, DC, provided several word lists.

The following shared descriptions of their agencies' computerized readability techniques:

- Dr. Lydia Hooke, Air Force Human Resources Laboratory, Technical Training Division, Lowry AFB, Colorado
- Mrs. Linda Smith, Advanced Systems Division, Social Security Administration, Baltimore, Maryland

Mr. James Sisk of the Defense Language Institute, Lackland AFB, Texas, provided technical word lists.

The National Cash Register Company of Dayton, Ohio, gave TAEG permission to use parts of the word list from their NCR Fundamental English Dictionary.



TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
I	INTRODUCTION. . . . . 7
	Background. . . . . 7
	Purpose of the Report . . . . . 8
	Organization of the Report. . . . . 8
II	DEVELOPMENT OF THE COMPUTER READABILITY EDITING SYSTEM. . . . . 9
	Overview. . . . . 9
	System Hardware . . . . . 10
	Software Features of the System . . . . . 10
	Readability Formula. . . . . 10
	Common Word List . . . . . 10
	Supplementary Technical Word Lists . . . . . 13
	Word Substitution Lists. . . . . 14
	Editing Process . . . . . 16
III	TEST OF THE COMPUTER READABILITY EDITING SYSTEM . . . . . 23
	Test Passages . . . . . 23
	Evaluation of CRES Features . . . . . 24
	Readability Formula. . . . . 24
	Common Word List . . . . . 24
	Word Substitution Lists. . . . . 24
	Evaluation Criteria . . . . . 24
	Grade Level Reduction. . . . . 25
	Specificity. . . . . 25
	Percent of Accurate Substitutions. . . . . 26
	Evaluation of Two Word Substitution Lists . . . . . 26
	Grade Level Reduction. . . . . 26
	Specificity. . . . . 26
	Tradeoff Between Grade Level Reduction and Specificity . . . . . 27
	Percent of Accurate Substitutions . . . . . 27
IV	CONCLUSIONS AND RECOMMENDATIONS . . . . . 29
	Conclusions . . . . . 29
	Recommendations . . . . . 30

TAEG Report No. 83

TABLE OF CONTENTS (continued)

<u>Section</u>	<u>Page</u>
REFERENCES . . . . .	31
Appendix A The Common Word List. . . . .	33
Appendix B The Basic Navy Word List. . . . .	61
Appendix C The Supplementary Technical Lists . . . . .	75
Appendix D The Army Word Substitution List with Grammatical Variations. . . . .	85
Appendix E The Navy Verb List with Verb Variations . . . . .	101
Appendix F The Test Passages . . . . .	111
Appendix G How to Use TAEGs Computer Readability Editing System. . . . .	133

TAEG Report No. 83

LIST OF ILLUSTRATIONS

<u>Figure</u>		<u>Page</u>
1	Elements of the Computer Readability Editing System . . . . .	9
2	Flowchart Showing Phases of Editing by the Computer Readability Editing System. . . . .	18
3	Warnings About Electrical Equipment; Computer Analysis of Original Text with Hand Editing Notes (Grade Level 17.1) . .	20
4	Warnings About Electrical Equipment; Computer Analysis of Revised Text (Grade Level 8.0) . . . . .	21
G-1	Sample of Text Taken from the Navy's Uniform Policy Regulations (NAVPERS 15665C, 1978) Before Processing by TAEGs Computer Readability Editing System (Readability is at the College Graduate Level.). . . . .	135
G-2	Same Sample of Text After Computer Processing. Various Features of the System Are Annotated. . . . .	136
G-3	Sample Printout with Editing Notes. . . . .	139
G-4	Passage After Changes Suggested by Computer Analysis. . . . .	142
G-5	Final Manuscript of Revised Text After Processing by TAEGs Computer Readability Editing System (Readability is at the High School Level.). . . . .	144

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Word Lists Used in the Common Word List . . . . .	11
2	Rules for Inflected Endings . . . . .	12
3	Occupational Groupings Suggested by Job Oriented Basic Skills (JOBS) . . . . .	13
4	Examples of Different Substitution Strategies . . . . .	15
5	Examples of Word Transformations. . . . .	17
6	Percent of Proposed Substitutions Judged Accurate and Number of Proposed Substitutions (By List and Test Selection). . . . .	27

SECTION I

INTRODUCTION

BACKGROUND

The Navy relies heavily on technical documents for training and maintenance functions. According to figures tabulated by the Naval Technical Information Presentation Program<sup>1</sup> (NTIPP), the Navy's investment in technical manuals is tremendous:

- There are approximately 25 million pages of technical publications in the Navy's current inventory with a value of \$5 billion.
- About 3 million pages of technical publications are issued or reissued annually.
- A typical U.S. Navy ship carries 1,300 technical manuals totaling 325,000 pages.

Unfortunately, these expensive Navy technical materials are often too difficult for enlisted personnel to use. Two major aspects of the problem are articulated in recent studies by the General Accounting Office (GAO):

- A growing number of Navy enlisted personnel have reading deficiencies (GAO, 1977).
- Technical manuals for the U.S. military services are difficult to read and use. In addition, it will cost an estimated \$65 million for the Navy to rewrite them to a lower reading level to enable the recruits of the 1980s to understand them (GAO, 1979).

An additional aspect of the problem with technical manuals was identified in a recent survey conducted for NTIPP (Hughes-Fullerton, 1978). This survey found that technical manuals are used extensively in formal and informal training, but they usually have to be supplemented heavily to be usable as training documents.

The three military services have produced further evidence that technical manuals are written at a level too difficult for use by enlisted personnel. Recent summary publications include: Caylor, Sticht, Fox and Ford, 1973 (Army); Duffy, 1976 (Navy); and Kniffin, Stevenson, Klare, Entin, Slaughter and Hooke, 1979 (Air Force).

The Chief of Naval Education and Training (CNET), in recognition of these problems, tasked the Training Analysis and Evaluation Group (TAEG) to

<sup>1</sup> Personal communication, S. C. Rainey, Technical Manager, NTIPP.

## TAEG Report No. 83

undertake the development of the Computer Readability Editing System (CRES)<sup>2</sup> and to develop remedial aids for enlisted personnel with deficient academic skills.<sup>3</sup> These tasks are complementary in that both are designed to close the literacy gap.

TAEG Report No. 79 (Kincaid and Curry, 1979) describes the development and test of a remedial reading workbook currently in use for Navy recruits. A companion remedial numerical skills workbook is currently under development and will be described in a future TAEG report.

### PURPOSE OF THE REPORT

This report describes the development of a CRES to assist in the improvement of the readability of Navy technical manuals and training materials.

### ORGANIZATION OF THE REPORT

In addition to this introduction, the report contains three sections and seven appendices. Section II provides an overview of the CRES and describes each feature of the system, the rationale for its inclusion in the system, and its development. Section III summarizes the results of an evaluation of the effectiveness of the system in helping an editor or writer. Section IV contains conclusions and recommendations. Appendices A through E contain complete listings of the word lists developed for use with the system. Appendix F contains the test passages used to evaluate the system. Appendix G shows an example of the use of the system.

<sup>2</sup> CNET ltr of 29 June 1978.

<sup>3</sup> CNET ltr of 20 December 1978.

SECTION II

DEVELOPMENT OF THE COMPUTER READABILITY EDITING SYSTEM (CRES)

This section contains an overview of the CRES and its operation. It also contains a description of each feature of the system, its development, and the rationale for including it.

OVERVIEW

Figure 1 shows the major components of the CRES. These include the computer equipment and the data files which contain the various features of the system. The CRES was designed to contain features that:

- provide useful feedback for authors and editors to simplify training and technical manual materials
- are consistent with existing DOD and Navy directives governing the preparation of simplified manuals
- can reduce the cost of preparing and revising technical manuals and training materials.

Each of these features is discussed in detail in subsequent paragraphs.

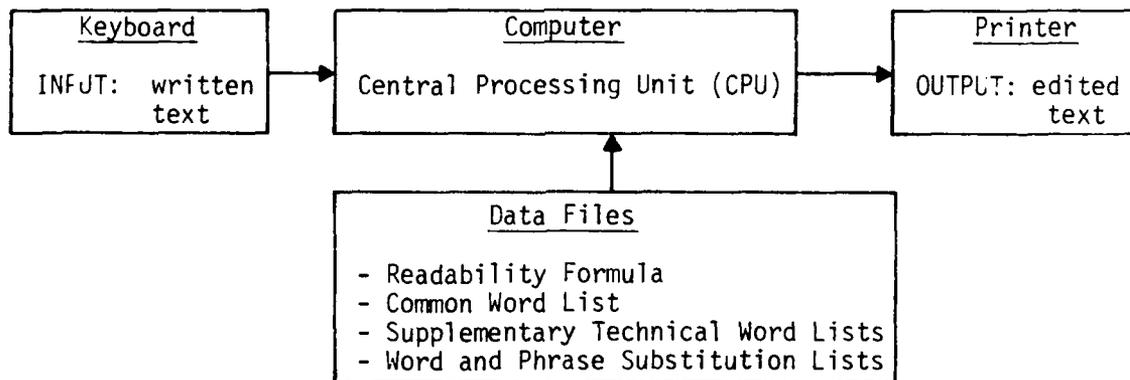


Figure 1. Elements of the Computer Readability Editing System

The basic purpose of CRES is to accept written narrative material, evaluate that material for readability, and suggest editorial changes in content (words) based on stored lists of words which have been developed to reduce the difficulty of reading material.

## SYSTEM HARDWARE

The hardware components of CRES include an input device (keyboard), the central processing unit (CPU), mass storage devices (disks and tapes), and the output device (the printer). The specific hardware used in TAEs system includes:

- WANG 2216A or 2236D CRT for displaying and editing
- WANG 2200 VP or MVP CPU
- Flexible disk drive
- WANG 2200 compatible printer
- 15 megabyte platter and compatible 90 megabyte disk drive.

Current cost of this equipment is about \$40,000.

## SOFTWARE FEATURES OF THE SYSTEM

**READABILITY FORMULA.** A readability formula provides a measure of the reading difficulty of a sample of text. The Flesch-Kincaid Readability Formula (Kincaid, Fishburne, Rogers, and Chissom, 1975) is used in the system because it is the DOD standard (MIL-M-38784A, Amendment 5, 24 July 1978). This formula provides a reading grade level of the sample text which refers to the "average" reading ability of those who should be able to understand the text. It is a recalculation of the Flesch Reading Ease Formula (Flesch, 1948).

The formula was developed by testing Navy enlisted personnel on their understanding of passages from rate training manuals. The Flesch-Kincaid Formula is:

$$\text{Grade Level} = .39 (\text{Avg. No. Words/Sentences}) + 11.8 (\text{Avg. No. Syllables/Word}) - 15.59$$

The computer program that calculates this formula is adapted from the General Motors STAR program which was originally designed to calculate the Flesch Reading Ease Formula. The program counts the number of syllables, words, and sentences in a passage of text, then computes the above formula. The grade level thus produced by the editing system serves as a general guide to the writer concerning the appropriateness of the material for the intended readers. If the grade level is too high, the text should be simplified.

Readability formulas provide only a general indication of the overall level of difficulty. The other components of the CRES provide more specific feedback to writers about particular words and sentences.

**COMMON WORD LIST.** The Common Word List was developed to identify uncommon words. If a word is not on the list, it is presumed to be uncommon. If a word is flagged as *uncommon*, a decision must be made whether to retain it, replace it with a simpler word, or define it. This decision is subjective

and must be made by the author or editor, not by the computer. Simplifying the words used in training and technical manual texts will result in instructional material that is more easily read and understood by the trainee and the technician. The Common Word List is a merged list made up of five published word lists plus one list specifically prepared to include Navy-specific words. The five published lists come from both military and non-military sources. Table 1 contains a short description of each list and gives its source.

TABLE 1. WORD LISTS USED IN THE COMMON WORD LIST

Military Lists	
•	Basic Navy Word List: 1,960 words that appeared 10 or more times in a 240,000 word sample taken from Navy recruit training texts.
•	American Institute for Research List: 1,570 words derived from frequency analysis taken from a 238,480 word sample of Army, Navy, and Air Force training courses.
•	Bureau of Naval Personnel Verb List: 270 verbs derived from recommendations of verbs to be used in occupational standards by the Occupational Standards Committees.
•	Army Familiar Word List: 2,170 words taken from the 2,980 words on the Dale list and modified by deleting uncommon Army words and adding common Army words to the original Dale list.
Nonmilitary Lists	
•	National Cash Register Fundamental (NCR) English Word List: 1,220 words derived by a frequency analysis of a sample of 97,000 words taken from NCR training materials. The published list is the result of two modifications by an NCR panel of users.
•	Basic English Word List: 850 words judged to be the essential words needed for communication developed by English scholar O. G. Ogden and associates over a 10 year period during the 1930s.

The Basic Navy Word List described in table 1 was derived from a computer frequency analysis of the two major documents used in the Navy's recruit training curriculum--Basic Military Requirements (1973) and the 20th edition of The Bluejackets' Manual (1978). The words from these two training manuals were entered into the computer. Only those pages of Basic Military Requirements that the recruits actually read in recruit training were keyed into the computer. All the text of The Bluejackets' Manual was available on machine-readable computer magnetic tape and was used for the frequency analysis. From these two documents almost 240,000 words were analyzed to obtain word frequency counts. Only those words which had a frequency of 10 or more were

included in the Basic Navy Word Lists; acronyms, numbers, and punctuation marks were not included. Also, the list was edited to include only "root words," that is, those words in the present tense and singular. The Basic Navy Word List is made up of two kinds of words: (1) common familiar words that a high school graduate should know and (2) terms that are unique to the Navy or general military environment.

An initial analysis showed that the Basic Navy Word List did not contain a number of obvious common words, such as "none" and "if." Therefore five published word lists, judged to contain a preponderance of words commonly used in Navy training and job reading materials, were added to the Basic Navy Word List. In addition, the Dale-Chall list (Dale and Chall, 1948) and the Harris-Jacobson list (Harris and Jacobson, 1972) were considered but not included because they were deemed inappropriate for Navy enlisted personnel.

Each of the lists described in table 1 was entered into computer memory then merged alphabetically resulting in a list of about 3,200 different root words. Nearly all of these were retained in the final Common Word List. A few of the words from the NCR list were dropped because they were specific to that company. Appendix A contains the Common Word List, including the Basic Navy Word List; appendix B contains the Basic Navy Word List alone.

In the Common Word List described above, each word has only one inflected form. These "root words," however, can have different inflected forms when they actually appear in text. The root words of the Common Word List were expanded by attaching various standard endings to each word. (See table 2 for the inflected endings attached to each word.) These inflected forms of the root words are based on rules developed by Harris and Jacobson (1975).

TABLE 2. RULES FOR INFLECTED ENDINGS

Root word plus	-s (plural), -y, -ly, -ily -s, es, 's (possessive) -d, -ed, -er, -est (comparative)
All words with double consonant before	-ing, -er (comparative), -est
All words dropping final -e before	-ed, -ing, -er (comparative), -est
All words changing y to i before adding	-ed, -es, -er (comparative), -est

An expanded list containing all possible endings for each root word resulted from processing the words by computer with a program designed to apply the rules of table 2. In addition, the expanded list had to be modified to add irregular verbs and a few other word forms. The algorithm of table 2 produced some "nonsense" words (e.g., the word "ship" is expanded by the algorithm to

include words like "shippiest"). The final word list containing the inflected endings is called the "expanded Common Word List." This was the form of the Common Word List actually used in the CRES. The expanded Common Word List is currently being edited to remove nonwords. This will reduce the total number of words in the list from about 37,000 words to about 14,000 words and thus allow faster operation of the system.

SUPPLEMENTARY TECHNICAL WORD LISTS. Although the Common Word List should contain most words in general Navy reading material, it does not contain many technical terms used in specialized reading material. Therefore, it was necessary to construct supplemental lists for use with certain kinds of specialized material.

The technical supplementary lists contain technical terms which are frequently used and commonly known by technical specialists but not by a non-specialist. For example, an electronics technician would certainly know the meaning of "capacitance" whereas a nonspecialist might not. These supplemental lists are a necessary part of the CRES for the editing of text dealing with technical specialties, otherwise the system would flag words like "capacitance" appearing in electronics training materials. Word list categories were chosen to coincide with clusters of ratings within the Navy that use a common core of technical terms. Three Navy occupational groupings were suggested by the Job Oriented Basic Skills (JOBS) Program. The JOBS program is designed to improve the basic skills of sailors with aptitude scores too low to allow them to enter "A" schools. Categories for the lists include: propulsion engineering, electronics, and administrative-clerical. Table 3 shows the three occupational categories and sample ratings within each category.

TABLE 3. OCCUPATIONAL GROUPINGS SUGGESTED BY JOB ORIENTED BASIC SKILLS (JOBS)

Three Occupational Categories and Ratings Within Each Category		
<u>Propulsion Engineering</u>	<u>Electronics</u>	<u>Administrative-Clerical</u>
Boiler Technician Engineman Machinist's Mate	Gunner's Mate Electronics Technician	Yeoman Personnelman Storekeeper

The words which were combined into the final three supplementary lists were taken from three sources: (1) chapters from the Naval Sea Systems Command Manual NAVSEA S9086, (2) glossaries taken from relevant rate training manuals and Navy training courses, and (3) technical word lists taken from manuals published by the Defense Language Institute. After merging words from the three sources for each of the specialty areas, the combined lists were each judged for appropriateness by subject matter experts. References for each of the sources, and the lists to which each contributed, are contained in appendix C along with the lists.

The first source of supplementary words, NAVSEA manual, was chosen because it is a reference source carried aboard many Navy ships and because it contains text generally representative of Navy technical manuals and training materials. A computer frequency analysis was used to identify the most frequently occurring technical words. Words on the Common Word List were excluded from this frequency count. Chapters dealing with lighting and basic electronics contributed to the electronics list. Chapters dealing with damage control and disposal of hazardous materials contributed to the propulsion engineering list. Chapters dealing with administering funds and records and reports contributed to the administrative-clerical list. The text of the six chapters was available on magnetic tape. Words that appeared at least twice were included on the initial list that was subjected to editing by appropriate subject matter experts.

The second source of technical words for the supplementary lists were appropriate rate training manual glossaries. Five rate training manual glossaries were used to obtain technical words for the electronics list, two were used to obtain words for the propulsion engineering list, and one was used to obtain words for the administrative-clerical list. In addition to the rate training manuals cited at the end of appendix C, two glossaries from Navy training courses contributed to the lists: (1) a handout used in Basic Electronics and Electricity "A" School at Orlando, Florida (electronics list) and (2) a handout used in the propulsion strand of JOBS taught at San Diego, California (propulsion engineering list).

The third source of words for the supplementary technical word lists were glossaries contained in manuals published by the Defense Language Institute (DLI). The subject matter for the DLI training courses corresponds to the three specialty lists. The titles of the DLI manuals and the specialty list to which each contributed are Basic Electronics (electronics list), Maintenance and Mechanics (propulsion engineering list), and Clerical and Administrative, (clerical-administrative list).

Words from each of the sources were combined to form a single list for each of the specialties. Subject matter experts (noncommissioned officers and petty officers with appropriate ratings) identified the most important terms in their specialty in a two part process. Initially, a single expert checked those words which "A" School graduates (as listed in table 3) should know. Then a new computer printout was prepared containing only the terms checked. Three subject matter experts then independently rated words on the reduced list using the same criterion. Words in the final supplementary lists, as contained in appendix C, are those that at least two of three subject matter experts identified as necessary to perform the particular specialty.

**WORD SUBSTITUTION LISTS.** A word substitution dictionary is a feature of the system because a good way to improve the readability of a manual is to replace awkward words with simpler or more specific words. A word substitution list can help an editor to do this. The words to be replaced are unnecessarily long, unfamiliar, or perhaps imprecise. The recommended substitute (or substitutes) is shorter, more familiar, or more precise. Once undesirable words are identified and substitutes offered, the writer makes a decision as to whether or not to replace the word with one of its

TAEG Report No. 83

proposed substitutes. A word substitution list and the Common Word List can help a writer with word control.

Two existing word substitution lists were adapted for use in the system. They were the Army Word Substitution List (Cir 310-9, 15 December 1978, Headquarters Department of the Army) and the Navy Verb List (DOD-STD-1685(SH)). Each list consisted of words needing replacement with at least one, sometimes two or more, recommended substitutes. A few of the substitutes were phrases, but most were words. Only two substitutes were retained. The Army word Substitution List (excluding phrases, which were put on a special phrase list) contained 183 words paired with recommended substitutes. The Navy Verb List contained 108 verbs with recommended substitutes. The Navy Verb List also included a number of verbs designated "Use more specific verb" and a number of verbs which were "recommended verbs"; these were not included in the word-substitution list adopted for TAEGs system from the Navy Verb List. Some overlap was noted among the Army List, the Navy Verb List, and the TAEG Common Word List. The purpose of this approach was to test the lists as separate units.

Both of the above lists had been compiled using expert judgment. The major criterion for the inclusion of words in the Army List was that substitutes should be short and often one syllable; thus, its recommended substitutes are the common words of the language. Selection of words for the Navy Verb List followed several guidelines contained in DOD-STD-1685(SH). "The simplest, most familiar, and most concrete words---shall be used. Short words, words typically learned early in life,---shall be preferred." "Concrete and specific language shall be used---", and "nonspecific verbs shall be avoided in favor of verbs designating specific user actions."

To summarize, two strategies were used in compiling the substitution lists: the use of simple, common words and the use of specific verbs. Example 1, table 4, shows substitutes that are common verbs; example 2, table 4, shows substitutes that are more specific verbs than the ones replaced.

TABLE 4. EXAMPLES OF DIFFERENT SUBSTITUTION STRATEGIES

Example No. and Type of Strategy	Word	Substitute	Form
1. Substitutes that are more common verbs than the ones replaced (From the Army List)	affix	put	verb
	constitutes	is	verb
2. Substitutes that are more specific verbs than the ones replaced (From the Navy Verb List)	mate	attach	verb
	stop	shut-down	verb

In the original substitution lists each word appeared with its recommended substitute(s) in only one form. Since a word can appear in a variety of inflected forms in text, each word and its substitute(s) was transformed into several inflected forms for use in computer editing, thus expanding the word substitution lists. Only transformations that maintained like meanings for words and their substitutes were used in the expanded lists.

Table 5 contains a listing and examples of the master guidelines by which transformations of words were achieved. The only transformations used on the Navy Verb List were those which produced verb forms, thus retaining the original nature of the list. The three verb transformations plus the original verb form are shown in example 2 of table 5. Irregular verbs departed from these rules somewhat, usually requiring a past participle form in addition to the four forms shown in example 2, table 5. An irregular verb and its transformations are shown in example 3 of table 5.

All inflected forms of a word were considered to be variations on one root word if they were all of the same part of speech. The root word would be the form originally appearing in the list, and in the case of nouns or verbs would usually be the singular noun form or the plain verb form (see examples 2, 3, and 4 of table 5). When evaluation was of the words themselves, root words were the unit of evaluation.

The expanded Army List contained 725 different word forms, and the expanded Navy Verb List contained 431 different word forms.<sup>4</sup> The number of root words was 261 for the Army List and 108 for the Navy Verb List. The expanded Army List is contained in appendix D and the expanded Navy Verb List in appendix E.

#### EDITING PROCESS

The operation of the system is illustrated in figure 2. The first step is to select those features of the system which are to be included. Then text is entered either by keying or through the use of magnetic tapes or some other machine-readable medium. After text is entered, each word, except proper names, is compared against the words in a series of lists: the Common Word List, any of several supplemental word lists, and the word and phrase substitution list. If a word is not found on the Common Word List and any supplemental word list which might be in use, it is flagged. If a word or phrase contained in the substitution list is encountered, it is flagged and one or two generally better substitutes are provided.

<sup>4</sup> A few of the inflected forms of the Army List had been excluded prior to this count. These exclusions were due to the word and its substitute being inappropriately matched for this particular form. The total number of such exclusions was 22.

TABLE 5. EXAMPLES OF WORD TRANSFORMATION

Example No. and Type of Transformation	Original Word		Transformed Word	
	Word	Substitute Form	Word	Substitute Form
1. A transformation that leads to nonequivalent meanings	employ	use verb	employer	user noun
2. Three transformations for regular verbs	activate	start verb, plain	activated activating activates	started starting starts verb, past verb, present participle verb, singular
3. Four transformations for irregular verbs	elect	choose verb, plain	elected elected electing elects	chose chosen choosing chooses verb, past verb, past participle verb, present participle verb, singular
4. Three transformations for nouns	location	place noun, singular	locations location's locations'	places place's places' noun, plural noun, possessive noun, plural possessive

**NOTE:** Additional grammatical variations are possible but these are by far the most common.

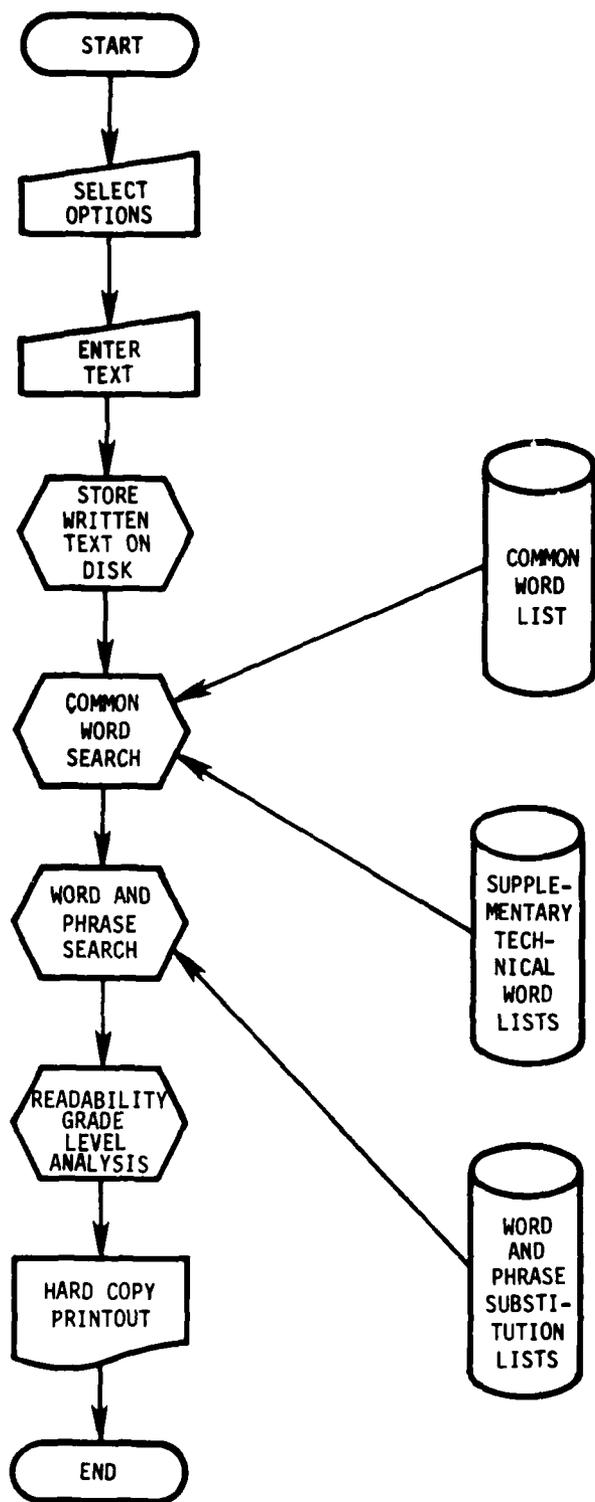


Figure 2. Flowchart Showing Phases of Editing by the Computer Readability Editing System

TAEG Report No. 83

The printout in figure 3 contains this text along with computer-generated editing notes. Changes and corrections are done by the author or editor using his judgment as well as the computer-generated suggestions.

The printout illustrates features of the editing system which:

- flag uncommon words--those not on the Common Word List or supplementary technical word lists being used
- flag long sentences--those over 22 words
- suggest replacements for awkward words and phrases
- provide the grade level of difficulty according to the DOD readability standard--the Flesch-Kincaid Formula.

In addition, the system flags misspelled words if they are not on the Common Word List.

The printout in figure 4 shows the revised text. All changes made were suggested by the CRES. Note that the reading grade level of the revised text is 8.0, a considerable improvement over the 17.1 grade level of the original text.

An additional, more detailed example of the evaluated and revised text using the CRES is shown in appendix G.

TAEG Report No. 83

~~Under no circumstances should any person reach within or enter the~~  
~~(enclosure) for the purpose of servicing or adjusting the equipment~~  
~~by yourself. Make sure~~  
~~without presence or assistance of another person~~  
~~able to help is with you~~  
 1/ Do not depend  
 upon door switches or interlocks for protection. <sup>but</sup> always shut  
 down motor generators or other equipment. <sup>Do not remove or short</sup>  
~~Under no circumstances~~  
~~should~~ any access gate, door, or other safety interlock switch ~~be~~  
~~removed, (short-circuited, or, tampered) with in any way, by~~  
~~other than~~ authorized maintenance personnel, <sup>can do this.</sup> nor should ~~(reliance)~~  
~~be (placed) (PUT) upon~~ <sup>Do not depend on</sup> the interlock switches for removing  
 voltages from the equipment. /2/

----- READABILITY RESULTS -----

Number of Sentences	Number of Words	Number of Syllables
3	95	164
Avg. Number of Words per Sentence	Avg. Number of Syllables per Word	
31.66	1.72	
GRADE LEVEL (Based on DOD Readability Standard)		
17.1		

----- WORDS NOT ON BASIC LIST -----

WORD	FREQ	WORD	FREQ
enclosure	1	reliance	1
short-circuited	1	tampered	1

-----NOTES-----

- / 1/ This sentence contains 32 words - consider shortening it.
- / 2/ This sentence contains 44 words - consider shortening it.

Figure 3. Warnings About Electrical Equipment;  
 Computer Analysis of Original Text  
 with Hand Editing Notes (Grade Level 17.1)

TAEG Report No. 83

Do not reach within or enter the [enclosure] to service or adjust the equipment by yourself. Make sure another person able to help is with you. Do not depend upon door switches or interlocks for protection; always shut down motor generators or other equipment. Do not remove, or short circuit any access gate, door, or other safety interlock switch. Only authorized maintenance personnel can do this. Do not depend on the interlock switches for removing voltages from the equipment.

----- READABILITY RESULTS -----			
Number of Sentences	Number of Words	Number of Syllables	
7	79	129	
Avg. Number of Words per Sentence	Avg. Number of Syllables per Word		
11.28	1.63		
GRADE LEVEL	(Based on DOD Readability Standard)		
8.0			
----- WORDS NOT ON BASIC LIST -----			
WORD	FREQ	WORD	FREQ
enclosure	1		

Figure 4. Warnings About Electrical Equipment;  
Computer Analysis of Revised Text  
(Grade Level 8.0)

SECTION III

TEST OF THE COMPUTER READABILITY EDITING SYSTEM

Each feature of the CRES was tested using carefully chosen samples of text representative of a wide variety of Navy training materials and technical manuals. Altogether more than 10,000 words of text (described below) constituted the test passages.

The following paragraphs describe the test materials, specific procedures used to evaluate the CRES, and the results of this evaluation.

TEST PASSAGES

The passages used to test the Common Word List and the word substitution lists included: (1) FORCAST (Caylor, Sticht, Fox, and Ford, 1973) and Kincaid (Kincaid, Fishburne, Rogers, and Chissom, 1975) passages, (2) Naval Sea Systems Command (NAVSEA) passages, and (3) instructional and procedural passages. The test passages, except for the Kincaid and the FORCAST passages, are contained in appendix F. This appendix also contains a listing of source documents from which the passages were taken.

The FORCAST and the Kincaid passages are general test passages taken from a variety of military texts. These test passages were used originally to develop readability formulas specifically for military use and were considered appropriate to test the CRES as well. The overall reading grade level of these passages covered a range of readability levels from the seventh grade to college graduate.

The NAVSEA passages were used to test both the Common Word List and the word substitution lists. These were selected because they are frequently used aboard ship to describe various common operating and maintenance tasks. These are technical manual chapters that cover a wide variety of occupational specialties such as damage control, electronics, lighting, and hazardous materials. The overall reading grade level of these NAVSEA passages is relatively high; the approximate grade levels were from the 12th grade to well above college graduate level.

The procedural and instructional test passages were also used to test both the Common Word List and the word substitution lists. The instructional passages were taken from manuals on such topics as aircraft radar maintenance, uniform regulations, Army equipment operations, and damage control. The procedural passages were taken from missile maintenance instructions and tactical computer maintenance instructions. The readability grade levels for these passages are in the low range; grade levels ranged from the 8th to the 12th grade.

In summary, the test passages cover a wide variety of material that Navy enlisted personnel would have to read. They have been taken from procedural and instructional texts as well as training manuals and were written at a wide range of readability grade levels.

## EVALUATION OF CRES FEATURES

**READABILITY FORMULA.** The readability formula was the first feature of the system to be programmed for the computer and tested. The Flesch-Kincaid Formula is based on the number of sentences, number of words, and number of syllables. An accurate manual count had been made of each of the 18 passages used in the present analysis. Agreement between the manual and computer counts was nearly perfect. Correlation coefficients for each of the pairs of these three factors were above .99.

**COMMON WORD LIST.** Evaluation of the Common Word List was basically a subjective process. It consisted of judging whether or not words flagged as uncommon did, in fact, appear to be uncommon. Each passage from the test passages was analyzed using the Common Word List. A listing of words not on the Common Word List was printed at the bottom of each analyzed passage. As a result of a subjective judgment by the authors of this report, it was concluded that the Common Word List was sufficiently complete for most purposes. It was judged that fewer than 1 percent of words in the test passages were inappropriately flagged as uncommon.

**WORD SUBSTITUTION LISTS.** The word substitution lists required a more thorough evaluation than other features of the system because each substitution made in the CRES analysis of the test passages had to be separately judged by a variety of measures. A description of these measures is presented next, followed by the results of the application of these measures to the test passages.

Evaluation Criteria. Three measures were selected to be used as criteria to evaluate the word substitutions:

- the reduction in grade level from a word to its first substitute, where grade level means the lowest grade in which most individuals know the meaning of the word
- the change in specificity from a word to its first substitute, where specificity is determined by the number of different meanings of a word
- the percent of proposed substitutions that were judged accurate, or appropriate.

Reduction in grade level is a measure of special importance because of its relation to the first of the two word requirements stated in DOD-STD-1685(SH). As discussed above, paragraph 4.4.1 of DOD-STD-1685(SH) emphasized that words used in publications should be simple, familiar, and learned early in life. Both the Army List and the Navy Verb List were designed using this concept.

The evaluation was applied to two different units: individual words with their recommended substitutes and entire substitution lists. The list evaluation is valuable in determining how well already-existing substitution lists perform in actual use. The individual word evaluation is valuable in deciding which word and recommended substitute pairs to keep and which to

discard. For word evaluation, the different inflected forms were grouped into root words, as described above, and the root word was the unit of evaluation.

Grade Level Reduction. The reduction in grade level from a word to its first substitute was determined by use of The Living Word Vocabulary (Dale and O'Rourke, 1976). This publication is a national inventory of the word knowledge of children and young adults in grades 4, 6, 8, 10, 12, 13, and 16. A grade level was obtained from this source for each word and for each first substitute.<sup>5</sup> This was usually the grade at which at least 67 percent, but less than 85 percent, knew the meaning of the word.<sup>6</sup> The reduction in grade level was obtained by subtracting the substitute's grade level from the word's grade level. After finding the grade level reduction for each word and first substitute pair in this way, the grade level reduction for each list was determined by taking the mean grade level of all word and first substitute pairs in the list.<sup>7</sup> Generally, the lower the grade level of a word, the more familiar it is. When substitutes reduce grade level, they are replacing words with more familiar, simpler substitutes.

Specificity. Change in specificity was determined by referring to specific information contained in Dale and O'Rourke (1976). Words often have several meanings. Dale and O'Rourke listed only what they considered the most common definitions for each word. For each word and for each first substitute, the number of meanings listed in this source was found. Since being specific means that a word has relatively few meanings, the fewer the number of meanings the more specific the word. If a substitute has fewer meanings than the word it replaced, the substitute is more specific than the original word. Conversely, if the substitute has more meanings, it is not as specific as the original word. The change in specificity for an entire list was determined by taking the average number of meanings for words and for first

<sup>5</sup>For a few words or substitutes a grade level was not available. A grade level reduction could not be determined for such cases. When the grade level was missing for either a word or its first substitute, both were excluded from computation of the mean grade level reduction for the list.

<sup>6</sup>Many common words have several meanings. Dale and O'Rourke list all of the commonly used meanings for each word, with a grade level for each meaning. The intended meaning of each word in the Army List and the Navy Verb List was usually obvious when the word was compared to its recommended substitute. Likewise, the intended meaning of each substitute was usually obvious when the substitute was compared to its word. Percent levels of 67-85 were arbitrarily chosen by the authors.

<sup>7</sup>The N for this mean was the total number of word forms in the list minus the number of pairs which were excluded. The number of pairs excluded from the Army List was 123 of 727, and the number excluded from the Navy Verb List was 152 of 431.

substitutes of the list and then comparing them to find the mean change in specificity for the list.<sup>8,9</sup>

Percent of Accurate Substitutions. The appropriateness of word substitution was rated by two TAEG personnel assigned to the computer readability editing project using a rating scale which featured a forced-choice (accurate vs. inaccurate) decision plus an assessed degree of the accuracy or inaccuracy.

The rating of accuracy of a substitution was based on whether the substitute would have the same meaning in the context of the passage as the original word and would fit the sentence well. Whether the substitution made reading easier was judged by grade level reduction and specificity; thus, accuracy was judged by similarity of substitutes. Only the word with the higher rating was used because writers would use only the better substitute.

Evaluation of Two Word Substitution Lists. The Army List and the Navy Verb List were evaluated for specificity, grade level reduction, and percent of accurate substitutions. Separate measures were kept for three types of passages: NAVSEA, procedural, and instructional. As mentioned above, the NAVSEA manual is a widely used document containing both procedural and instructional passages.

Grade Level Reduction. For the Army List the mean grade level reduction from a word to its first substitute was 7.9 to 5.0, a mean reduction of 2.9 grade levels. For the Navy Verb List the mean grade level reduction from a word to its first substitute was 7.1 to 4.9, a mean reduction of 2.2 grade levels. The grade level reduction was greatest for the Army List, but both lists showed substantial reductions.

Specificity. The mean change in specificity from a word to its first substitute for the Army List was from 1.98 meanings to 4.27 meanings, an increase of 2.29 meanings. For the Navy Verb List this same change was from 2.66 meanings to 3.86 meanings, an increase of 1.20 meanings. For both lists, going from words to their substitutes caused an increase in generality although reducing grade level.

<sup>8</sup>Some words and some first substitutes were not listed by Dale and O'Rourke (1976). When either a word or its first substitute was missing, both were excluded from computation of the mean change in specificity for their list. The number of excluded pairs for the Army List was 22 and for the Navy Verb List was 34. This mean was based on the number of words in the original substitution lists prior to expansion. The Ns were then, for the Army List, 183 minus 22 and for the Navy Verb List, 108 minus 34.

<sup>9</sup>Dale and O'Rourke (1976) did not list all meanings of each word. Using criteria of their own they apparently selected enough meanings of each word to cover its usual uses. The selection of different meanings is discussed by Dale and O'Rourke on page III of the introduction. Because not all meanings were used, the number of meanings listed by these authors might not be an interval scale of specificity; this measure should be an excellent approximation to specificity, however, at the rank-order level or better.

Tradeoff Between Grade Level Reduction and Specificity. There was a tradeoff between lists in these measurements. The Army List achieved the most grade level reduction but at the cost of specificity. The Navy Verb List was more specific but had less grade level improvement. The substitutes were more familiar and simple but less specific than the words they replaced. Thus, the substitution lists moved in the direction of the first requirement of DOD-STD-1685(SH) but did not move in the direction of the second requirement. That only one of these measures moved in the desired direction is not surprising. Common words usually have more meanings than uncommon words; therefore, to increase familiarity is usually to reduce specificity. Some substitutes satisfied one requirement while others satisfied the other requirement, but most reduced grade level.

Percent of Accurate Substitutions. Table 6 shows the percent of proposed substitutions which were judged accurate. The values in the table are the means of two raters. Separate values were calculated for each list and kind of text.

TABLE 6. PERCENT OF PROPOSED SUBSTITUTIONS JUDGED ACCURATE AND NUMBER OF PROPOSED SUBSTITUTIONS (BY LIST AND TEST SELECTION)

List	Type of Text			Overall
	NAVSEA	Procedural	Instructional	
Army				
No. Proposed Substitutions	112	103	125	340
Percent of Accurate Substitutions	71.0%*	77.2%*	80.4%*	76.2%**
Navy Verb				
No. Proposed Substitutions	50	129	43	222
Percent of Accurate Substitutions	46.0%*	66.0%*	74.0%*	66.1%**

\* The percent was computed for each rater and then averaged over the two raters.

\*\* The total number of accurate substitutions divided by the total number of proposed substitutions for each rater, averaged for the two raters.

For each text selection the Army List was higher in accuracy of substitutions than the Navy Verb List with an overall difference between the two lists of 13.2 percent. The Navy Verb List had an especially low percentage of accurate substitutions when used with the NAVSEA text. The Army List also had its lowest percent of accurate substitutions when used with the NAVSEA text, but the difference between this percentage and those with the other two text selections was less severe with the Army List than with the Navy Verb List.

The test of the Army List showed it to give accurate substitutes with reasonably good success--three of four proposed substitutions had the correct meaning. Also, its percent of accurate substitutions was fairly consistent over different sources of text.

The Army List made more than  $1\frac{1}{2}$  times as many proposed substitutions, overall, as the Navy Verb List made, presumably because the Army List is longer and is not restricted to verbs.

The Navy Verb List made many more proposed substitutions when it was used with the procedural text than when used with either of the other two types of text--three times the number of proposed substitutions made with the instructional text and over  $2\frac{1}{2}$  times the number made with the NAVSEA text. That this was not due to the procedural text being longer can be seen by looking at the number of proposed substitutions made by the Army List--fewer with the procedural text than with the other two selections. The Navy Verb List's increased number of proposed substitutions when used with the procedural text was probably related to the criteria guiding the list's construction.

In comparing the Army List and the Navy Verb List, the Army List produced the largest grade level reduction, the highest overall percent of accurate substitutions, and the greatest overall frequency of accurate substitutions. The Navy Verb List proved to be more specific than the Army List.

The Army List produces simple words as substitutes, produces them in fair numbers, and with reasonable accuracy. Also, it seems to perform consistently when used with text selections from different sources. The only problem associated with its use is that the substitutions usually are more general than the words replaced. The Army List seems to be reliable and useful in a variety of situations.

The Navy Verb List seems to have its greatest usefulness with a particular type of material--highly technical writing, such as descriptions of procedures to be followed. This list produces many proposed substitutions when used with such material and produces them with sufficient accuracy. (It was competitive with the Army List on this type of material.) Thus, the Navy Verb List seems to be more specialized than the Army List, working best on the material for which it was apparently designed.

This evaluation of the Army List and the Navy Verb List has been based on the complete lists. Modifications of the lists might result in still better performance.

SECTION IV

CONCLUSIONS AND RECOMMENDATIONS

This section contains conclusions about operation of the prototype system and recommendations for its use by the Navy for improving the quality of training materials and technical manuals.

CONCLUSIONS

Specific conclusions regarding operation of the system are given below.

1. The particular configuration of hardware used in the prototype system represents a reasonable cost (about \$40,000) and produces analyses with sufficient speed to be useful in a production context.
2. The computerization of the Flesch-Kincaid Readability Formula has the potential for saving considerable time in the verification and control of readability grade levels for technical manuals produced under military contract. This formula is the DOD standard for readability measurement (MIL-M-38784A, Amendment 5, 24 July 1978), making its use a frequent contractual requirement imposed by the Army and Navy.
3. The feature of the system which flags long sentences appears to satisfactorily encourage writers and editors to rewrite and improve such sentences.
4. The Common Word List and Supplementary Technical Lists appear to be reasonably complete. Flagged words were judged to actually be uncommon. An interesting by-product of the Common Word List is that it aids in detecting misspelled words as they may be flagged as uncommon. This feature should prove useful during the proofreading of the text.
5. The word substitution feature of the system may be the most helpful feature to the writer or editor in that it gives the most concrete suggestion for rewriting. Suggested substitutes in the two lists tested gave correct meanings and were simpler than the words they replaced.  
  
There are two military requirements for word use according to DOD-STD-1685(SH): words should be simple and they should be specific. Both of the word substitution lists tested satisfied the first requirement, but neither of them satisfied the second requirement. It would be almost impossible for word substitution lists to bring about improvement on both of these requirements simultaneously, since simplicity and specificity in words tend to be negatively related. Development of future word substitution lists will have to be based on a compromise between these two requirements.
6. The Navy Verb List works best with a certain type of manual--procedures to be followed. With this type of text, the Navy Verb List produces a greater number of accurate substitutions per 100 words of text than the Army List.

TAEG Report No. 83

7. Users of the system will have to add to the word lists, particularly the supplementary technical lists, to fit unique needs. Some users will need to construct additional word lists for special purposes.

RECOMMENDATIONS

1. The CRES should now be placed in an operational context to insure its applicability. Several military agencies have expressed an interest in using and further developing the system.

2. A cost-benefit analysis should be conducted as part of the operational test of the system.

3. An on-line editing capability should be added to the CRES. The computer program's efficiency should be increased and made transportable between various makes of computer equipment.

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TAEG Report No. 83

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TAEG Report No. 83

APPENDIX A

THE COMMON WORD LIST

This is the root-word form of the Common Word List. The expanded form of this list was the form actually used for processing in TAEGs computer readability editing system.

A  
ABANDON  
ABBREVIATION  
ABILITY  
ABLE  
ABNORMAL  
ABOARD  
ABOUT  
ABOVE  
ABRASIVE  
ABSENCE  
ABSENT  
ABSOLUTE  
ABSORB  
ABUSE  
ABUSER  
ACCELERATE  
ACCEPT  
ACCEPTABLE  
ACCESS  
ACCESSORY  
ACCIDENT  
ACCOMPLISH  
ACCORD  
ACCORDANCE  
ACCORDING  
ACCOUNT  
ACCOUNTING  
ACCUMULATE  
ACCURACY  
ACCURATE  
ACCUSE  
ACID  
ACKNOWLEDGE  
ACOUSTIC  
ACRE  
ACROSS  
ACT  
ACTION  
ACTIVATE  
ACTIVE  
ACTIVITY  
ACTUAL  
ACTUATE  
ADAPT  
ADAPTABLE  
ADD  
ADDITION  
ADDITIONAL  
ADDITIVE

ADDRESS  
ADEQUATE  
ADHESIVE  
ADJECTIVE  
ADJUST  
ADJUSTMENT  
ADMINISTER  
ADMINISTRATION  
ADMINISTRATIVE  
ADVANCE  
ADVANCEMENT  
ADVANTAGE  
ADVERB  
ADVERTISEMENT  
ADVISE  
AFAR  
AFFAIR  
AFFECT  
AFLOAT  
AFT  
AFTER  
AFTERNOON  
AFTERWARD  
AGAIN  
AGAINST  
AGE  
AGED  
AGENT  
AGGREGATE  
AGO  
AGREE  
AGREEMENT  
AHEAD  
AID  
AIM  
AIR  
AIRBORNE  
AIRCRAFT  
AIRFIELD  
AIRPLANE  
AIRPORT  
AIRSHIP  
AIRSPEED  
AIRY  
ALARM  
ALCOHOL  
ALCOHOLIC  
ALCOHOLISM  
ALERT  
ALGEBRA

ALGEBRAIC  
ALGORITHM  
ALIGN  
ALIGNMENT  
ALIKE  
ALL  
ALLIES  
ALLOCATE  
ALLOW  
ALLOWANCE  
ALLOY  
ALMOST  
ALONE  
ALONG  
ALONGSIDE  
ALOUD  
ALPHABET  
ALPHABETIC  
ALPHANUMERIC  
ALREADY  
ALSO  
ALTER  
ALTERNATE  
ALTHOUGH  
ALTIMETER  
ALTITUDE  
ALUMINIUM  
ALWAYS  
AM  
AMERICAN  
AMIDSHIPS  
AMMONIA  
AMMUNITION  
AMONG  
AMOUNT  
AMPERAGE  
AMPERE  
AMPHIBIOUS  
AMPLIFIER  
AMPLIFY  
AMPLITUDE  
AMUSEMENT  
AN  
ANALOG  
ANALYSIS  
ANALYST  
ANALYZE  
ANCHOR  
AND  
ANGLE



BATHE  
BATTERY  
BATTLE  
BATTLESHIP  
BAY  
BE  
BEACH  
BEACON  
BEAD  
BEAM  
BEAN  
BEAR  
BEARING  
BEAT  
BEAUTIFUL  
BECAME  
BECAUSE  
BECOME  
BECOMING  
BED  
BEE  
BEEN  
BEFORE  
BEGAN  
BEGIN  
BEGINNING  
BEHOLD  
BEHAVIOR  
BEHIND  
BEING  
BELIEF  
BELIEVE  
BELL  
BELLY  
BELOW  
BELT  
BENCH  
BEND  
BENEATH  
BENEFIT  
BENT  
BERRY  
BETH  
BESIDE  
BESIDES  
BEST  
BET  
BETTER  
BETWEEN  
BEYOND

BIAS  
BIDIRECTIONAL  
BIG  
BILGE  
BILL  
BILLET  
BIN  
BINARY  
BIND  
BINDER  
BINOCULARS  
BIOLOGICAL  
BIRD  
BIRTH  
BIT  
BITE  
BITING  
BITTEN  
BITTER  
BLACK  
BLACKBOARD  
BLADE  
BLANK  
BLANKET  
BLAST  
BLAZE  
BLEED  
BLEED  
BLEM  
BLIND  
BLINDFOLD  
BLOCK  
BLOOD  
BLOT  
BLOW  
BLOWN  
BLUE  
BLUEPRINT  
BLUR  
BOARD  
BOAT  
BOATSWAIN  
BOB  
BODY  
BOIL  
BOILER  
BOILING  
BOLT  
BOMB  
BOND

BONE  
BOOK  
BOOM  
BOOST  
BOOT  
BORE  
BORESIGHT  
BORNE  
BORROW  
BOTH  
BOTTLE  
BOTTOM  
BOUGHT  
BOUNCE  
BOW  
BOWL  
BOX  
BOXCAR  
BOY  
BRAID  
BRAIN  
BRAKE  
BRAKING  
BRANCH  
BRASS  
BRAZE  
BREAD  
BREAK  
BREAKDOWN  
BREAST  
BREATH  
BREEZE  
BRICK  
BRIDGE  
BRIEF  
BRIGHT  
BRIGHTNESS  
BRING  
BRISTLE  
BRITISH  
BROAD  
BROADCAST  
BROKE  
BROKEN  
BRONZE  
BROOK  
BROOM  
BROTHER  
BROUGHT



CHEST  
CHEW  
CHIEF  
CHILDREN  
CHILL  
CHIMNEY  
CHIN  
CHIP  
CHOCK  
CHOICE  
CHOKER  
CHOOSE  
CHOP  
CHOSE  
CHURCH  
CHURN  
CIRCLE  
CIRCUIT  
CIRCUMFERENCE  
CIRCUMSTANCE  
CITIZEN  
CITY  
CIVIL  
CIVILIAN  
CLAIM  
CLAMP  
CLANG  
CLAP  
CLASS  
CLASSIFICATION  
CLASSIFY  
CLASSROOM  
CLAY  
CLAY  
CLEAN  
CLEANLINESS  
CLEAR  
CLEARANCE  
CLEAT  
CLERICAL  
CLERK  
CLICK  
CLIFF  
CLING  
CLIP  
CLOCK  
CLOCKWISE  
CLOSE  
CLOSURE  
CLOTH

CLOTHES  
CLOTHING  
CLOUD  
CLUB  
CLUMP  
CLUTCH  
COAL  
COARSE  
COAST  
COAT  
COCKPIT  
CODE  
COIL  
COIN  
COLD  
COLLAR  
COLLECT  
COLLECTION  
COLLEGE  
COLLISION  
COLON  
COLOR  
COLOUR  
COLUMN  
COMB  
COMBAT  
COMBATANT  
COMBINATION  
COMBINE  
COMBUSTION  
COME  
COMFORT  
COMFORTABLE  
COMMA  
COMMAND  
COMMANDER  
COMMENDATION  
COMMENT  
COMMERCIAL  
COMMISSION  
COMMIT  
COMMITTEE  
COMMON  
COMMUNICATE  
COMMUNICATION  
COMMUNITY  
COMPACT  
COMPANY  
COMPARE  
COMPARISON

COMPARTMENT  
COMPASS  
COMPENSATE  
COMPENSATION  
COMPETITION  
COMPILE  
COMPLAINT  
COMPLEMENT  
COMPLETE  
COMPLETION  
COMPLEX  
COMPLICATE  
COMPLY  
COMPONENT  
COMPOSE  
COMPOSITE  
COMPOSITION  
COMPOUND  
COMPRESS  
COMPRESSION  
COMPRESSOR  
COMPRISE  
COMPULSORY  
COMPUTE  
COMPUTER  
CONCENTRATE  
CONCENTRATION  
CONCEPT  
CONCERN  
CONCLUDE  
CONCRETE  
CONDENSATION  
CONDENSE  
CONDENSER  
CONDITION  
CONDUCT  
CONDUCTOR  
CONE  
CONFIGURATION  
CONFINE  
CONFINEMENT  
CONFUSE  
CONFUSION  
CONGRESS  
CONJUNCTION  
CONNECT  
CONNECTION  
CONSCIOUS  
CONSECUTIVE  
CONSEQUENCE

CONSIDER  
CONSIDERABLE  
CONSIDERATION  
CONSIST  
CONSTANT  
CONSTITUTION  
CONSTRUCT  
CONSTRUCTION  
CONTACT  
CONTAIN  
CONTAINER  
CONTAMINATE  
CONTAMINATION  
CONTENT  
CONTENTION  
CONTENTS  
CONTINUE  
CONTINUOUS  
CONTRACT  
CONTRAST  
CONTROL  
CONVENIENCE  
CONVENIENT  
CONVENTION  
CONVENTIONAL  
CONVERGE  
CONVERSION  
CONVERT  
CONVULSION  
COOK  
COOL  
COOLING  
COORDINATE  
COORDINATION  
COOPER  
COPY  
CORD  
CORE  
CORK  
CORKER  
CORPS  
CORRECT  
CORRECTION  
CORRESPOND  
CORRESPONDENCE  
CORRESPONDING  
CORROSION  
COST  
COT  
COTTAGE

COUGH  
COULD  
COUNSEL  
COUNSELOR  
COURT  
COUNTER  
COUNTERCLOCKWISE  
COUNTERMEASURE  
COUNTRY  
COUPLE  
COUPLING  
COURSE  
COURT  
COVER  
COX  
COXSAIN  
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CRAFT  
CRAMP  
CRANK  
CRASH  
CRAWL  
CREATE  
CREDIT  
CREEK  
CREEP  
CREPT  
CREW  
CREWMEMBER  
CRIME  
CRIMP  
CRITICAL  
CROP  
CROSS  
CROWD  
CROWN  
CRUEL  
CRUISE  
CRUISER  
CRUMBLE  
CRUSH  
CRUST  
GRY  
CRYSTAL  
CUBE  
CUBIC  
CUFF  
CUP  
CUPFUL

CURE  
CURL  
CURRENCY  
CURRENT  
CURTAIN  
CURVATURE  
CURVE  
CUSHION  
CUSTODY  
CUSTOM  
CUSTOMER  
CUT  
CUTTING  
CYCLE  
CYLINDER  
DAB  
DAILY  
DAM  
DAMAGE  
DAMP  
DANGER  
DANGEROUS  
DARE  
DARK  
DART  
DASH  
DATA  
DATE  
DATE  
DAUGHTER  
DAVIT  
DAWN  
DAY  
DAYBREAK  
DAYTIME  
DEACTIVATE  
DEAD  
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DEAL  
DEALER  
DEALT  
DEAR  
DEATH  
DEBIT  
DEBRIS  
DEBT  
DECEMBER  
DECIBEL  
DECIDE  
DECIMAL  
DECISION

DECK  
DECODE  
DECONTAMINATE  
DECONTAMINATION  
DECORATION  
DECREASE  
DECREMENT  
DEDICATE  
DEDUCTION  
DEED  
DEENERGIZE  
DEEP  
DEFEAT  
DEFECT  
DEFECTIVE  
DEFEND  
DEFENSE  
DEFINE  
DEFINITE  
DEFLECT  
DEGREE  
DEHYDRATE  
DELAY  
DELETE  
DELICATE  
DELIGHT  
DELIVER  
DELIVERY  
DEMOCRACY  
DEMONSTRATE  
DEMONSTRATION  
DENSITY  
DENTAL  
DEPART  
DEPARTMENT  
DEPEND  
DEPENDENCE  
DEPENDENT  
DEPOSIT  
DEPRESS  
DEPTH  
DEPUTY  
DESCEND  
DESCRIBE  
DESCRIPTION  
DESERT  
DESERTION  
DESERVE  
DESIGN  
DESIGNATE

DESIGNATION  
DESIRE  
DESK  
DESPITE  
DESTINATION  
DESTROY  
DESTRUCTOR  
DESTRUCTION  
DETACH  
DETACHMENT  
DETAIL  
DETECT  
DETECTION  
DETERMINE  
DETONATE  
DEVELOP  
DEVELOPMENT  
DEVIATE  
DEVIATION  
DEVICE  
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DEWATER  
DIAGNOSE  
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DIAGRAM  
DIAL  
DIAMETER  
DIAMOND  
DIAPHRAGM  
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DIFFERENCE  
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DIP  
DIRECT

DIRECTION  
DIRECTORY  
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DIRTY  
DISABILITY  
DISABLE  
DISADVANTAGE  
DISASSEMBLE  
DISASSEMBLY  
DISASTER  
DISBURSE  
DISCARD  
DISCHARGE  
DISCIPLINARY  
DISCIPLINE  
DISCONNECT  
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DISCRETION  
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DISCUSSION  
DISEASE  
DISENGAGE  
DISGUST  
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DISTORTION  
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DISTRIBUTE  
DISTRIBUTION  
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DITCH  
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DIVINE  
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DOCUMENT  
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DUCK  
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DURATION  
DURING  
DUST  
DUTY  
DWELL  
DWELT  
DYE  
DYNAMIC  
EACH  
EAGLE  
EAR  
EARLY  
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EASE  
EASILY  
EAST  
EASY  
EAT  
ECONOMY  
EDGE  
EDIT  
EDUCATION  
EDUCATIONAL  
EDUCTOR  
EFFECT  
EFFECTIVE  
EFFECTIVENESS  
EFFICIENCY  
EFFICIENT  
EFFORT  
EGG  
EIGHT  
EIGHTEEN  
EIGHTH  
EIGHTY  
EITHER  
EJECT  
ELAPSE  
ELASTIC  
ELBOW  
ELECTION  
ELECTRIC  
ELECTRICAL

ELECTRICIAN  
ELECTRICITY  
ELECTRODE  
ELECTRON  
ELECTRONIC  
ELECTRONICS  
ELEMENT  
ELEVATE  
ELEVEN  
ELIGIBILITY  
ELIGIBLE  
ELIMINATE  
ELSE  
ELSEWHERE  
EMBARK  
EMBED  
EMBOSS  
EMERGENCY  
EMPLOY  
EMPLOYEE  
EMPLOYMENT  
EMPTY  
ENABLE  
ENCODE  
END  
ENDORSE  
ENEMY  
ENERGIZE  
ENERGY  
ENFORCE  
ENGAGE  
ENGINE  
ENGINEER  
ENGINEERING  
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ENLIST  
ENLISTMENT  
ENOUGH  
ENSIGN  
ENSURE  
ENTER  
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ENTITLE  
ENTRANCE  
ENTRY  
ENVELOPE  
ENVIRONMENTAL  
EQUAL  
EQUATE  
EQUATOR

EQUIP  
EQUIPMENT  
EQUIPPED  
EQUIVALENT  
ERASE  
ERECT  
ERROR  
ESCAPE  
ESCORT  
ESPECIALLY  
ESSENTIAL  
ESTABLISH  
ESTABLISHMENT  
ESTIMATE  
ETCH  
EVACUATE  
EVALUATE  
EVALUATION  
EVAPORATE  
EVE  
EVEN  
EVENING  
EVENT  
EVENTUAL  
EVENTUALLY  
EVER  
EVERY  
EVERYBODY  
EVERYDAY  
EVERYONE  
EVERYTHING  
EVERYWHERE  
EXACT  
EXAMINATION  
EXAMINE  
EXAMPLE  
EXCEED  
EXCELLENT  
EXCEPT  
EXCEPTION  
EXCESS  
EXCESSIVE  
EXCHANGE  
EXCITE  
EXCLUDE  
EXCUSE  
EXECUTE  
EXECUTION  
EXECUTIVE  
EXERCISE

EXHAUST  
EXIST  
EXISTENCE  
EXISTING  
EXIT  
EXPAND  
EXPANSION  
EXPECT  
EXPECTED  
EXPERIENCE  
EXPERT  
EXPIRATION  
EXPLAIN  
EXPLANATION  
EXPLOSION  
EXPLOSIVE  
EXPOSE  
EXPOSURE  
EXPRESS  
EXTEND  
EXTENDED  
EXTENSIVE  
EXTENT  
EXTERNAL  
EXTINGUISH  
EXTRA  
EXTREME  
EYE  
FABRICATE  
FACE  
FACEPIECE  
FACILITY  
FACING  
FACT  
FACTOR  
FACTORY  
FAHRENHEIT  
FAIL  
FAILURE  
FAINT  
FAIR  
FAKE  
FALL  
FALLEN  
FALLOUT  
FALSE  
FAMILIAR  
FAMILY  
FAN  
FANTAIL

FAR  
FARAWAY  
FARE  
FARM  
FARTHER  
FASHION  
FAST  
FASTEN  
FASTENER  
FAT  
FATAL  
FATHER  
FATHOM  
FAULT  
FEAR  
FEATHER  
FEATURE  
FEBRUARY  
FED  
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FEE  
FEEBLE  
FEED  
FEEDBACK  
FEEL  
FEELING  
FEET  
FELL  
FELLOW  
FELT  
FEMALE  
FENCE  
FERTILE  
FEW  
FIBER  
FICTION  
FIELD  
FIFTEEN  
FIFTH  
FIFTY  
FIGHT  
FIGHTER  
FIGURE  
FILE  
FILL  
FILM  
FILTER  
FINAL  
FINALIZE  
FINALLY



GEOGRAPHY  
GET  
GETTING  
GIBBET  
GIBBON  
GIVE  
RIVER  
GLANCE  
GLASS  
GLAZE  
GLEAM  
GLIDE  
GLOSSARY  
GLOVE  
GLOW  
GLUE  
GO  
GOAL  
GOAT  
GOES  
GOOGLES  
GOLD  
GONE  
GOOD  
GOT  
GOVERN  
GOVERNMENT  
GOVERNOR  
GRAD  
GRADE  
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GRAIN  
GRAM  
GRAND  
GRANT  
GRAPH  
GRASP  
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GRAVE  
GRAVEL  
GRAVITY  
GRAY  
GREASE  
GREAT  
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GRID  
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GROCERY  
GROOM  
GROOVE  
GROSS  
GROUND  
GROUP  
GROVE  
GROW  
GROWTH  
GUARD  
GUESS  
GUEST  
GUIDANCE  
GUIDE  
GUIDELINE  
GUILT  
GULF  
GUM  
GUN  
GUNFIRE  
GUNNERY  
GUNPOWDER  
GUY  
HABIT  
HAD  
HAIL  
HAIR  
HAIRPIN  
HALF  
HALL  
HALT  
HAMMER  
HAND  
HANDFUL  
HANDLE  
HANDLING  
HANDS  
HANDWRITING  
HANG  
HANGAR  
HANGING  
HAPPEN  
HAPPY  
HARBOR  
HARD  
HARDEN  
HARDENED  
HARDLY

HARDNESS  
HARDSHIP  
HARDWARE  
HARM  
HARMFUL  
HARMONIZE  
HARMONY  
HARNESS  
HARPOON  
HAS  
HASTE  
HASTY  
HAT  
HATCH  
HATCHET  
HATE  
HAUL  
HAVE  
HAZARD  
HAZARDOUS  
HE  
HEAD  
HEADER  
HEADQUARTERS  
HEADSET  
HEALTH  
HEALTHY  
HEAP  
HEAR  
HEARD  
HEARING  
HEART  
HEAT  
HEAVE  
HEAVING  
HEAVY  
HEEL  
HEIGHT  
HELD  
HELICOPTER  
HELMET  
HELMSMAN  
HELP  
HELPFUL  
HEM  
HER  
HERE  
HICKORY  
HID  
HIDDEN

HIDE  
HIGH  
HIGHLY  
HIGHWAY  
HILL  
HILLSIDE  
HILLTOP  
HILLY  
HIM  
HIMSELF  
HIND  
HINCE  
HINT  
HIP  
HIPE  
HIS  
HISS  
HISTORY  
HIT  
HITCH  
HITCH  
HOLD  
HOLDON  
HOLE  
HOLLER  
HONEY  
HOING  
HONK  
HONOR  
HONORABLE  
HOOD  
HOOF  
HOOK  
HOOP  
HOP  
HOPE  
HORIZON  
HORIZONTAL  
HORN  
HORSE  
HORSEPOWER  
HOSE  
HOSPITAL  
HOT  
HOTEL  
HOUND  
HOUR  
HOUSE  
HOUSEFALL  
HOUSING

HOW  
HOWEVER  
HOWL  
HUG  
HUGE  
HULL  
HUM  
HUMAN  
HUMIDITY  
HUMOR  
HUMP  
HUNDRED  
HUNG  
HUNK  
HUNT  
HURRIED  
HURRY  
HURT  
HUSH  
HUT  
HYDRAULIC  
HYGIENE  
HYPHEN  
I  
ICE  
ICY  
IDEA  
IDEAL  
IDENTICAL  
IDENTIFICATION  
IDENTIFY  
IDLE  
IF  
IGHITE  
IGNITION  
IGNORE  
ILL  
ILLUMINATE  
ILLUSTRATE  
ILLUSTRATION  
IMAGE  
IMAGINE  
IMMEDIATE  
IMPACT  
IMPEDANCE  
IMPLEMENT  
IMPLY  
IMPORTANCE  
IMPORTANT  
IMPOSE

IMPOSSIBLE  
IMPROVE  
IMPROVEMENT  
IMPULSE  
IN  
INACTION  
INACTIVE  
INBOARD  
INCENTIVE  
INCH  
INCLUDE  
INCOME  
INCORPORATE  
INCREASE  
INCREMENT  
INDEED  
INDEPENDENT  
INDEX  
INDICATE  
INDICATION  
INDICATOR  
INDIRECT  
INDIVIDUAL  
INDOCTRINATE  
INDOORS  
INDUCE  
INDUCT  
INDUSTRY  
INFECTION  
INFLATE  
INFLUENCE  
INFORM  
INFORMATION  
INGREDIENT  
INITIAL  
INITIALIZE  
INITIATE  
INJECT  
INJECTION  
INJURE  
INJURY  
INK  
INLET  
INNER  
INPUT  
INQUIRY  
INSECT  
INSERT  
INSIDE  
INSIGNIA

INSPECT  
INSPECTION  
INSTALL  
INSTALLATION  
INSTANCE  
INSTANT  
INSTANTANEOUS  
INSTEAD  
INSTRUCT  
INSTRUCTION  
INSTRUCTOR  
INSTRUMENT  
INSULATE  
INSULATION  
INSUPANCE  
INSURE  
INTAKE  
INTEGER  
INTEGRATE  
INTEGRITY  
INTELLIGENCE  
INTEND  
INTENSE  
INTENSITY  
INTENT  
INTERACT  
INTERCEPT  
INTERCHANGEABLE  
INTEREST  
INTERESTED  
INTERESTING  
INTERFACE  
INTERFERE  
INTERIOR  
INTERLOCK  
INTERMEDIATE  
INTERNAL  
INTERNATIONAL  
INTERPRET  
INTERRUPT  
INTERSECT  
INTERVAL  
INTERVIEW  
INTO  
INTRODUCE  
INTRODUCTION  
INVALID  
INVENTION  
INVENTORY  
INVERT

INVESTIGATE  
INVESTIGATION  
INVITE  
INVOICE  
INVOLVE  
IRON  
IS  
ISLAND  
ISOLATE  
ISSUE  
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ITEM  
ITS  
ITSELF  
IVORY  
JACK  
JACKBOX  
JACKET  
JAIL  
JAN  
JANUARY  
JAR  
JAW  
JAW  
JELLY  
JERK  
JET  
JEWEL  
JIG  
JOB  
JOCKEY  
JOIN  
JOINT  
JOURNAL  
JOURNEY  
JUDGE  
JUG  
JULY  
JUMP  
JUMPER  
JUNCTION  
JUNE  
JUNIOR  
JUNK  
JURISDICTION  
JUST  
JUSTICE  
JUSTIFY  
KEEN  
KEEP  
KEPT

KETTLE  
KEY  
KEYBOARD  
KICK  
KILL  
KILOGRAM  
KIND  
KISS  
KIT  
KITE  
KNEE  
KNEEL  
KNEW  
KNIFE  
KNIT  
KNIVES  
KNOB  
KNOCK  
KNOT  
KNOW  
KNOWLEDGE  
KNOWN  
LABEL  
LABOR  
LABORATORY  
LACE  
LACK  
LADDER  
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LAIN  
LAKE  
LAME  
LAMP  
LAND  
LANDING  
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LANGUAGE  
LANTERN  
LAP  
LARD  
LARGE  
LASH  
LAST  
LATCH  
LATE  
LATITUDE  
LATTER  
LAUGH  
LAUNCH  
LAUNCHER

LAUNDRY  
LAUNDRY  
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LAWFUL  
LAY  
LAYER  
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LEAD  
LEADER  
LEADERSHIP  
LEADING  
LEAF  
LEAK  
LEAKAGE  
LEAN  
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LEARNING  
LEAST  
LEATHER  
LEAVE  
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LEFT  
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LEGAL  
LEND  
LENGTH  
LENGTHEN  
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LESSON  
LET  
LETAL  
LETTER  
LETTING  
LEVEL  
LEVER  
LIBERTY  
LIBRARY  
LICE  
LICENSE  
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LID  
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LIEUTENANT  
LIFE  
LIFEBOAT  
LIFT  
LIGHT

LIGHTER  
LIGHTNING  
LIGHTWEIGHT  
LIKE  
LIKELY  
LIMB  
LINE  
LIMIT  
LIMITED  
LIMP  
LINE  
LINEAR  
LINEN  
LINK  
LINT  
LIP  
LIQUID  
LIQUOR  
LIST  
LISTEN  
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LITERAL  
LITRE  
LITTLE  
LIVE  
LIVELY  
LIVING  
LOAD  
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LOANES  
LOCAL  
LOCALIZE  
LOCATE  
LOCATION  
LOCK  
LOCKER  
LOCOMOTIVE  
LOG  
LOGIC  
LONE  
LONG  
LONGITUDE  
LOOK  
LOOKOUT  
LOOP  
LOOSE  
LOOSEN  
LORAN  
LOSE

LOSS  
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LOT  
LOUD  
LOVE  
LOW  
LOWERCASE  
LUBRICANT  
LUBRICATE  
LUBRICATION  
LUMBER  
LUMP  
LUNG  
LYING  
MACHINE  
MACHINERY  
MADE  
MAGAZINE  
MAGNESIUM  
MAGNET  
MAGNETIC  
MAGNETO  
MAIL  
MAILBOX  
MAIN  
MAINTAIN  
MAINTENANCE  
MAJOR  
MAJORITY  
MAKE  
MAKING  
MALE  
MALFUNCTION  
MAN  
MANAGE  
MANAGEMENT  
MANAGER  
MANEUVER  
MANIFOLD  
MANNER  
MANUAL  
MANUFACTURE  
MANUFACTURER  
MANY  
MAP  
MAPLE  
MARBLE  
MARCH  
MARGIN  
MARINE















SHAWL  
SHEW  
SHOWER  
SHOWN  
SHUT  
SHY  
SICK  
SIDE  
SIDEWALK  
SIDEWAYS  
SIGHT  
SIGN  
SIGNAL  
SIGNALMAN  
SIGNATURE  
SIGNIFICANT  
SILENCE  
SILENT  
SILICON  
SILLY  
SILL  
SILVER  
SIMILAR  
SIMPLE  
SIMPLY  
SIMULATE  
SIMULTANEOUS  
SINCE  
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SINGLE  
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SIP  
SIR  
SISTER  
SIT  
SITE  
SITTING  
SITUATION  
SIX  
SIXTEEN  
SIXTH  
SIXTY  
SIAL  
SIBER  
SKILL  
SKIN  
SKIN  
SKIP  
SLANT  
SLAY

SLACK  
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SLAP  
SLASH  
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SLID  
SLIDE  
SLIGHT  
SLING  
SLIP  
SLIPPERY  
SLIT  
SLOPE  
SLOT  
SLOW  
SLUNG  
SMALL  
SMART  
SMASH  
SHELL  
SMILE  
SMOKE  
SMOOTH  
SMAIL  
SNAKE  
SNAP  
SHAPPING  
SNEEZE  
SNOW  
SHUG  
SO  
SOAK  
SOAP  
SOCIAL  
SOCIETY  
SOCK  
SOD  
SOFT  
SOIL  
SOLD  
SOLDER  
SOLDIER  
SOLE  
SOLENOID

SOLID  
SOLUTION  
SOLVE  
SOLVENT  
SOME  
SOMEBODY  
SOMEHOW  
SOMEONE  
SOMETHING  
SOMETIME  
SOMETIMES  
SOMEWHAT  
SOMEWHERE  
SON  
SONAR  
SONG  
SOON  
SORT  
SOUGHT  
SOUND  
SOUP  
SOUR  
SOURCE  
SOUTH  
SPACE  
SPADE  
SPAN  
SPAR  
SPARE  
SPARK  
SPEAK  
SPEAR  
SPECIAL  
SPECIALIST  
SPECIALIZE  
SPECIALTY  
SPECIFIC  
SPECIFICALLY  
SPECIFICATION  
SPECIFY  
SPED  
SPEECH  
SPEED  
SPELL  
SPEND  
SPIKE  
SPILL  
SPIN  
SPINDLE  
SPIRAL

SPLASH  
SPLICE  
SPLINT  
SPLIT  
SPOIL  
SPOKE  
SPOKEN  
SPARK  
SPOON  
SPORT  
SPOT  
SPRING  
SPRAY  
SPREAD  
SPRING  
SPRINKLE  
SPRING  
SPUN  
SQUADRON  
SQUARE  
SQUEAK  
SQUEEZE  
STABILITY  
STABLE  
STACK  
STAFF  
STAGE  
STAIN  
STAKE  
STALL  
STAMP  
STAND  
STANDARD  
STANDBY  
STAR  
STARBOARD  
STARE  
START  
STARVE  
STATE  
STATEMENT  
STATIC  
STATION  
STATIONARY  
STATOR  
STATUS  
STAY  
STEADY  
STEAM  
STEAMER

STEEL  
STEEP  
STEEPLE  
STEER  
STEERING  
STEM  
STEP  
STERILE  
STERILIZE  
STERN  
STICK  
STICKY  
STIFF  
STILL  
STING  
STIR  
STITCH  
STOCK  
STOCKING  
STOMACH  
STONE  
STOOD  
STOOL  
STOOP  
STOP  
STOPPED  
STOPPER  
STOPPING  
STORAGE  
STORE  
STORM  
STORY  
STOVE  
STOW  
STOWAGE  
STRAIGHT  
STRAIGHTEN  
STRAIN  
STRAND  
STRANGE  
STRAP  
STRATEGIC  
STRAW  
STREAM  
STREET  
STRENGTH  
STRESS  
STRETCH  
STRETCHER  
STRICT

STRIKE  
STRIKEN  
STRIKER  
STRING  
STRIP  
STRIPE  
STROBE  
STROKE  
STRONG  
STRUCK  
STRUCTURAL  
STRUCTURE  
STRUNG  
STUB  
STUCK  
STUDENT  
STUDY  
STUFF  
STUMP  
STUNG  
SUBJECT  
SUBMARINE  
SUBMERGE  
SUBMIT  
SUBROUTINE  
SUBSEQUENT  
SUBSTANCE  
SUBSTITUTE  
SUBSYSTEM  
SUBTOTAL  
SUBTRACT  
SUCCESS  
SUCCESSFUL  
SUCH  
SUCK  
SUCTION  
SUDDEN  
SUFFER  
SUFFICIENT  
SUGAR  
SUGGEST  
SUGGESTION  
SUIT  
SUITABLE  
SUM  
SUMMARY  
SUMMER  
SUN  
SUNDAY  
SUNG

SUNE  
SUNLIGHT  
SUNNY  
SUNRISE  
SUNSET  
SUNSHINE  
SUPERIOR  
SUPERLATIVE  
SUPERMARKET  
SUPERSEDE  
SUPERSTRUCTURE  
SUPERVISE  
SUPERVISION  
SUPERVISOR  
SUPPLEMENTARY  
SUPPLY  
SUPPORT  
SUPPOSE  
SUPPRESSION  
SURE  
SURFACE  
SURGE  
SURPLUS  
SURPRISE  
SURRENDER  
SURVEY  
SURVIVAL  
SUSPECT  
SUSPEND  
SWALLOW  
SWAY  
SWEEP  
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SWIMMING  
SWING  
SWITCH  
SWIVEL  
SWORE  
SWORN  
SYMBOL  
SYMPTOM  
SYNCHRONIZE

SYNTHETIC  
SYSTEM  
TAB  
TABLE  
TABLESPOON  
TABLET  
TABULATION  
TACHOMETER  
TACK  
TACTIC  
TACTICAL  
TAG  
TAIL  
TAILOR  
TAKE  
TAKEN  
TAKING  
TALK  
TALKER  
TALL  
TAN  
TANK  
TAP  
TAPE  
TAPS  
TAR  
TARGET  
TASK  
TASTE  
TAUGHT  
TAUT  
TAX  
TAXI  
TEACH  
TEACHING  
TEAM  
TEAR  
TEASPOON  
TECHNICAL  
TECHNICIAN  
TECHNIQUE  
TEETH  
TELEPHONE  
TELL  
TELLER  
TEMPER  
TEMPERATURE  
TEMPORARY  
TEN  
TEND

TENDENCY  
TENDER  
TENSION  
TENT  
TENTH  
TERM  
TERMINAL  
TERMINATE  
TERRAIN  
TEST  
TESTIFY  
TEXT  
THAN  
THAT  
THE  
THEIR  
THEM  
THEMSELVES  
THEN  
THEORY  
THERE  
THEREBY  
THEREFORE  
THERMAL  
THESE  
THEY  
THICK  
THICKNESS  
THIMBLE  
THIN  
THING  
THINK  
THIRD  
THIRSTY  
THIRTEEN  
THIRTY  
THIS  
THOROUGH  
THOSE  
THOUGH  
THOUGHT  
THOUSAND  
THREAD  
THREE  
THREW  
THROAT  
THROTTLE  
THROUGH  
THROUGHOUT  
THROW

TANK  
TARANT  
TARD  
TARDON  
THURSDAY  
THIS  
TICK  
TICKET  
TIDE  
TIE  
TIGHT  
TIGHTEN  
TILL  
TILT  
TIME  
TIMING  
TIN  
TINY  
TIP  
TIRE  
TIRED  
TISSUE  
TITLE  
TO  
TODAY  
TOE  
TOE  
TOGETHER  
TOLD  
TOLERANCE  
TOLLBOOM  
TON  
TONE  
TONGUE  
TOO  
TOOK  
TOOL  
TOOLBOX  
TOOT  
TOOTH  
TOOTHPICK  
TOP  
TOPSIDE  
TOPE  
TOPE  
TOPPLE  
TOPPLE  
TOS  
TOTAL  
TOTE  
TOTE

TOURNIQUET  
TOY  
TOWARD  
TOWEL  
TOWER  
TOWN  
TOXIC  
TRACE  
TRACK  
TRACTOR  
TRADE  
TRAFFIC  
TRAIL  
TRAILER  
TRAILING  
TRAIN  
TRAINING  
TRANSACTION  
TRANSCRIBE  
TRANSFER  
TRANSFORMER  
TRANSLATE  
TRANSMISSION  
TRANSMIT  
TRANSMITTER  
TRANSPARENT  
TRANSPORT  
TRANSPORTATION  
TRANSVERSE  
TRAP  
TRASH  
TRAVEL  
TRAY  
TREAT  
TREATED  
TREATMENT  
TREE  
TRIAL  
TRIANGLE  
TRICK  
TRIED  
TRIGGER  
TRIP  
TRIP  
TROOP  
TROOPS  
TROUBLESHOOTING  
TROPICAL  
TROUBLE  
TROUBLESHOOT

TROUSERS  
TRUCK  
TRUE  
TRULY  
TRUNCATE  
TRUNK  
TRUST  
TRUTH  
TRY  
TUB  
TUBE  
TUESDAY  
TUG  
TUITION  
TUMBLE  
TUNE  
TUNNEL  
TURBINE  
TURBULENT  
TURN  
TWELVE  
TWENTY  
TWICE  
TWIG  
TWIN  
TWINE  
TWIRL  
TWIST  
TWISTED  
TWO  
TYPE  
TYPICAL  
UMBRELLA  
UNABLE  
UNAUTHORIZED  
UNCOVER  
UNDER  
UNDERSTAND  
UNDERSTOOD  
UNDERWATER  
UNDERWAY  
UNDESIRE  
UNFINISHED  
UNFOLD  
UNIFORM  
UNIMPORTANT  
UNION  
UNIQUE  
UNIT  
UNITE



WEST  
WET  
WEAT  
WHATSOEVER  
WHEEL  
WHEAT  
WHENEVER  
WHERE  
WHEREAS  
WHETHER  
WHICH  
WHILE  
WHIP  
WHIRL  
WHISPER  
WHISTLE  
WHITE  
WHO  
WHOLE  
WHOLESALE  
WHOM  
WHOSE  
WHY  
WIDE  
WIDTH  
WIGGLE  
WILL  
WILLFUL  
WILLING  
WIN  
WINCH  
MIND  
MINDGLASS  
MINDON  
MINE  
MING  
MINGOUT  
MINTER  
WIPE  
WIRE  
WIRING  
WISE  
WISH  
WITH  
WITHDRAW  
WITHDRAWAL  
WITHIN  
WITHOUT  
WITHSTAND  
WOMAN

WOMEN  
WON  
WONDER  
WOOD  
WOODEN  
WOODS  
WOOL  
WOOLEN  
WORD  
WORE  
WORK  
WORKMAN  
WORKSHEET  
WORLD  
WORM  
WORN  
WORRY  
WORSE  
WORST  
WORTH  
WOULD  
MOUTH  
MOVE  
WRAP  
WRAPPED  
WRECK  
WRENCH  
WRING  
WRIST  
WRITE  
WRITING  
WRITTEN  
WRONG  
WROTE  
WRUNG  
YARD  
YARN  
YAW  
YEAR  
YELL  
YELLOW  
YES  
YESTERDAY  
YET  
YIELD  
YOLK  
YOU  
YOUNG  
YOUR  
YOURSELF

YOURSELVES  
ZEBRA  
ZERO  
ZONE

TAEG Report No. 83

APPENDIX B

THE BASIC NAVY WORD LIST

This is the root-word form of the Basic Navy Word List. This list was combined with five others to form the Common Word List.

A  
ABANDON  
ABILITY  
ABLE  
ABOARD  
ABOUT  
ABOVE  
ABSENCE  
ABSENT  
ABUSE  
ABUSER  
ACCESS  
ACCIDENT  
ACCOMPLISH  
ACCORDANCE  
ACCORDING  
ACCOUNTING  
ACCURACY  
ACCURATE  
ACCUSE  
ACID  
ACKNOWLEDGE  
ACROSS  
ACT  
ACTION  
ACTIVE  
ACTIVITY  
ACTUAL  
ADD  
ADDITION  
ADDRESS  
ADEQUATE  
ADJUST  
ADJUSTMENT  
ADMINISTER  
ADVANCE  
AFFAIR  
AFFECT  
AFLOAT  
AFT  
AFTER  
AGAIN  
AGAINST  
AGE  
AGENT  
AHEAD  
AID  
AIM  
AIR  
AIRBORNE

AIRCRAFT  
ALARM  
ALCOHOL  
ALERT  
ALIGNMENT  
ALL  
ALLIES  
ALLOW  
ALLOWANCE  
ALMOST  
ALONE  
ALONG  
ALONGSIDE  
ALPHABET  
ALREADY  
ALSO  
ALTHOUGH  
ALTITUDE  
ALUMINUM  
ALWAYS  
AM  
AMERICAN  
AMIDSHIPS  
AMMONIA  
AMMUNITION  
AMONG  
AMOUNT  
AMPHIBIOUS  
AN  
ANCHOR  
AND  
ANGLE  
ANOTHER  
ANSWER  
ANTHEM  
ANTISUBMARINE  
ANY  
ANYONE  
ANYTHING  
APART  
APPARATUS  
APPEAR  
APPEARANCE  
APPLICABLE  
APPLY  
APPOINT  
APPREHEND  
APPRENTICESHIP  
APPROACH  
APPROPRIATE

APPROVAL  
APPROVE  
APPROXIMATE  
APTITUDE  
ARE  
AREA  
ARM  
ARMAMENT  
ARMOR  
ARMS  
ARMY  
AROUND  
ARREST  
ARTICLE  
ARTIFICIAL  
AS  
ASHORE  
ASK  
ASSAULT  
ASSEMBLY  
ASSIGN  
ASSIGNMENT  
ASSIST  
ASSISTANCE  
ASSOCIATE  
ASSUME  
ASTERN  
AT  
ATMOSPHERE  
ATTACH  
ATTACK  
ATTEMPT  
ATTEND  
ATTENTION  
AUTHORITY  
AUTOMATIC  
AUXILIARY  
AVAILABLE  
AVERAGE  
AVIATION  
AVOID  
AWARD  
AWAY  
AYE  
BACK  
BACKGROUND  
BAD  
BADGE  
BAG  
BALLISTIC

BAND  
 BANDAGE  
 BARGE  
 BARREL  
 BASE  
 BASIC  
 BASIS  
 BASKET  
 BATTERY  
 BATTLE  
 BATTLESHIP  
 BE  
 BEACH  
 BEAM  
 BEARING  
 BECAUSE  
 BECOME  
 BEEN  
 BEFORE  
 BEGIN  
 BEHIND  
 BEING  
 BELL  
 BELOW  
 BELT  
 BEND  
 BENEFIT  
 BERTHING  
 BESIDES  
 BEST  
 BETTER  
 BETWEEN  
 BEYOND  
 BIG  
 BILGE  
 BILL  
 BILLET  
 BINOCULARS  
 BIOLOGICAL  
 BIRTH  
 BITTER  
 BLACK  
 BLANKET  
 BLAST  
 BLEED  
 BLOCK  
 BLOOD  
 BLOW  
 BLUE  
 BOARD

BOAT  
 BOATSWAIN  
 BODY  
 BOILER  
 BOLT  
 BOMB  
 BONE  
 BOOK  
 BOOM  
 BOTH  
 BOTTOM  
 BOW  
 BOX  
 BOY  
 BRAID  
 BREAK  
 BREAST  
 BREATH  
 BREATHE  
 BRIDGE  
 BRIEF  
 BRIGHT  
 BRING  
 BRISTLE  
 BRITISH  
 BROAD  
 BROKEN  
 BROUGHT  
 BRUSH  
 BUILDING  
 BUILT  
 BULKHEAD  
 BUNK  
 BUOY  
 BUREAU  
 BURN  
 BURST  
 BUSINESS  
 BUT  
 BUTTON  
 BY  
 CABLE  
 CADENCE  
 CALIBER  
 CALL  
 CAME  
 CAMP  
 CAN  
 CANDIDATE  
 CANISTER

CANNISTER  
 CANNOT  
 CANS  
 CANVAS  
 CAP  
 CAPABILITY  
 CAPABLE  
 CAPACITY  
 CAPSTAN  
 CAPTAIN  
 CAPTURE  
 CARBON  
 CARD  
 CARE  
 CAREER  
 CAREFUL  
 CARGO  
 CARRIER  
 CARRY  
 CARTRIDGE  
 CASE  
 CASUALTY  
 CATCH  
 CATEGORY  
 CAUSE  
 CAUTION  
 CELESTIAL  
 CENTER  
 CENTERLINE  
 CENTRAL  
 CEREMONY  
 CERTAIN  
 CERTIFICATE  
 CHAIN  
 CHAMBER  
 CHAMBRAY  
 CHANCE  
 CHANGE  
 CHAPLAIN  
 CHAPTER  
 CHARACTERISTIC  
 CHARGE  
 CHART  
 CHECK  
 CHEMICAL  
 CHEST  
 CHIEF  
 CHILDREN  
 CHOCK  
 CHOKE

CHURCH  
CIRCLE  
CIRCUIT  
CIRCUMSTANCE  
CITIZEN  
CITY  
CIVIL  
CIVILIAN  
CLASS  
CLASSIFICATION  
CLEAN  
CLEANLINESS  
CLEAR  
CLEARANCE  
CLEAT  
CLERICAL  
CLICK  
CLOCKWISE  
CLOSE  
CLOSURE  
CLOTH  
CLOTHES  
CLOTHING  
COAST  
COAT  
CODE  
COIL  
COLD  
COLLAR  
COLLEGE  
COLLISION  
COLOR  
COLUMN  
COMBAT  
COMBATANT  
COMBINATION  
COMBINE  
COMBUSTION  
COME  
COMFORTABLE  
COMMAND  
COMMENDATION  
COMMERCIAL  
COMMISSION  
COMMIT  
COMMON  
COMMUNICATION  
COMPANY  
COMPARE  
COMPARTMENT

COMPASS  
COMPLAINT  
COMPLETE  
COMPLEX  
COMPLICATE  
COMPONENT  
COMPOSE  
COMPRESS  
COMPUTER  
CONCENTRATE  
CONCERN  
CONDITION  
CONDUCT  
CONFINE  
CONFUSION  
CONGRESS  
CONNECT  
CONSEQUENCE  
CONSIDER  
CONSIST  
CONSTANT  
CONSTITUTION  
CONSTRUCTION  
CONTACT  
CONTAIN  
CONTAMINATE  
CONTINUE  
CONTROL  
CONVENTION  
CONVERT  
CONVULSION  
COOL  
COORDINATION  
CORD  
CORNER  
CORPS  
CORRECT  
CORRESPONDENCE  
COST  
COTTON  
COULD  
COUNSEL  
COUNTERMEASURE  
COUNTRY  
COUPLING  
COURSE  
COURT  
COVER  
COXSWAIN  
CRAFT

CRAMP  
CREATE  
CREDIT  
CREW  
CRITICAL  
CROSS  
CRUISE  
CRUISER  
CURRENT  
CUSTODY  
CUSTOM  
CUT  
CYCLE  
DAILY  
DAMAGE  
DANGER  
DANGEROUS  
DARK  
DATA  
DATE  
DAVIT  
DAY  
DAYTIME  
DEAD  
DEAR  
DEATH  
DEBRIS  
DECK  
DECONTAMINATION  
DECORATION  
DEEP  
DEFENSE  
DEFINE  
DEGREE  
DELIVER  
DEMOCRACY  
DENTAL  
DEPARTMENT  
DEPEND  
DEPENDENCE  
DEPTH  
DEPUTY  
DESCRIBE  
DESERTION  
DESIGN  
DESIGNATE  
DESIRE  
DESPITE  
DESTROY  
DESTRUCTION

DETACHMENT  
DETAIL  
DETECT  
DETECTION  
DETERMINE  
DEVELOP  
DEVIATION  
DEVICE  
DEWATER  
DIAMETER  
DID  
DIESEL  
DIFFERENCE  
DIFFICULT  
DIGIT  
DIOXIDE  
DIRECT  
DIRECTION  
DIRT  
DISABILITY  
DISASTER  
DISBURSE  
DISCHARGE  
DISCIPLINARY  
DISCRETION  
DISCUSS  
DISEASE  
DISPLACE  
DISPOSAL  
DISTANCE  
DISTRESS  
DISTRICT  
DIVE  
DIVIDE  
DIVINE  
DIVISION  
DO  
DOCK  
DOG  
DONE  
DOOR  
DOSE  
DOUBLE  
DOUBT  
DOWN  
DRAFT  
DRAW  
DRAWN  
DRESS  
DRILL

DRINK  
DRIVE  
DRIVEN  
DROP  
DRUG  
DRUNK  
DRY  
DUE  
DURING  
DUST  
DUTY  
DYE  
EACH  
EAGLE  
EARLY  
EARN  
EARTH  
EASILY  
EAST  
EASY  
EAT  
EDGE  
EDUCATION  
EDUCTOR  
EFFECT  
EFFECTIVE  
EFFICIENCY  
EFFORT  
EIGHT  
EITHER  
ELASTIC  
ELBOW  
ELECTRIC  
ELECTRONIC  
ELIGIBILITY  
ELIGIBLE  
ELSE  
EMBARK  
EMERGENCY  
EMPLOYMENT  
EMPTY  
ENABLE  
END  
ENEMY  
ENERGY  
ENGAGE  
ENGINE  
ENGINEER  
ENGINEER ROOM  
ENLIST

ENLISTMENT  
ENOUGH  
ENSIGN  
ENSURE  
ENTER  
ENTIRE  
ENTITLE  
ENTRANCE  
ENTRY  
EQUAL  
EQUIP  
EQUIPMENT  
ERROR  
ESCAPE  
ESCORT  
ESPECIALLY  
ESSENTIAL  
ESTABLISH  
EVALUATE  
EVEN  
EVENING  
EVENT  
EVENTUALLY  
EVER  
EVERY  
EVERYONE  
EVERYTHING  
EXACT  
EXAMINATION  
EXAMPLE  
EXCELLENT  
EXCEPT  
EXCEPTION  
EXCESS  
EXCESSIVE  
EXCHANGE  
EXECUTE  
EXECUTION  
EXERCISE  
EXHAUST  
EXIST  
EXPECT  
EXPERIENCE  
EXPIRATION  
EXPLOSION  
EXPOSE  
EXPOSURE  
EXTEND  
EXTENSIVE  
EXTENT

EXTERNAL  
EXTINGUISH  
EXTRA  
EXTREME  
EYE  
FACE  
FACEPIECE  
FACILITY  
FACT  
FACTOR  
FAIL  
FAILURE  
FAIR  
FAKE  
FALL  
FALLOUT  
FALSE  
FAMILIAR  
FAMILY  
FANTAIL  
FAR  
FAST  
FASTEN  
FATAL  
FATHOM  
FEATURE  
FEDERAL  
FEEL  
FEET  
FELLOW  
FEMALE  
FEW  
FIBER  
FIELD  
FIGHT  
FIGHTER  
FIGURE  
FILE  
FILL  
FINAL  
FINANCIAL  
FIND  
FINE  
FINGER  
FIRE  
FIREBALL  
FIREFIGHTING  
FIREPLUG  
FIRM  
FIRST

FISCAL  
FIT  
FIVE  
FIX  
FLAG  
FLAME  
FLAMMABLE  
FLARE  
FLASH  
FLAT  
FLEET  
FLIGHT  
FLOATING  
FLOOD  
FLOW  
FLOWN  
FLUID  
FLY  
FOAM  
FOCUS  
FOG  
FOLD  
FOLLOW  
FOOD  
FOOT  
FOR  
FORCE  
FORE  
FOREARM  
FORECASTLE  
FOREIGN  
FORM  
FORMAL  
FORMER  
FORTH  
FORWARD  
FOUND  
FOUR  
FOURTH  
FRACTURE  
FRAME  
FREE  
FREQUENT  
FRESH  
FRIGATE  
FROM  
FRONT  
FUEL  
FULL  
FUME

FUNCTION  
FURTHER  
FUZE  
GAIN  
GAMMA  
GANGWAY  
GAS  
GASOLINE  
GEAR  
GENERAL  
GENERATOR  
GET  
GIVE  
GIVEN  
GLASS  
GLOVE  
GOGGLES  
GOLD  
GOOD  
GOVERNMENT  
GRADE  
GRADUAL  
GRANT  
GRASP  
GRAY  
GREASE  
GREAT  
GREEN  
GROOM  
GROUND  
GROUP  
GUARD  
GUIDANCE  
GUIDE  
GUIDELINES  
GUILT  
GUN  
GUNFIRE  
GUNNERY  
HAD  
HAIR  
HALF  
HAMMER  
HAND  
HANDLE  
HANDLING  
HANDS  
HANG  
HANGAR  
HARBOR

HARD  
HARDSHIP  
HARM  
HARMFUL  
HARNESS  
HARPOON  
HAS  
HAT  
HATCH  
HAUL  
HAVE  
HAZARD  
HAZARDOUS  
HE  
HEAD  
HEADQUARTERS  
HEADSET  
HEALTH  
HEAR  
HEART  
HEAT  
HEAVING  
HEAVY  
HEEL  
HEIGHT  
HELD  
HELICOPTER  
HELMSMAN  
HELP  
HER  
HERE  
HIGH  
HIGHLINE  
HIM  
HIMSELF  
HIS  
HISTORY  
HIT  
HITCH  
HOIST  
HOLD  
HOME  
HOMING  
HONOR  
HONORABLE  
HOOK  
HORIZON  
HORN  
HOSE  
HOSPITAL

HOT  
HOUR  
HOUSEFALL  
HOUSING  
HOW  
HOWEVER  
HULL  
HUMAN  
HUNDRED  
HYDRAULIC  
HYGIENE  
IDEA  
IDENTIFICATION  
IMMEDIATE  
IMPORTANCE  
IMPOSE  
IMPOSSIBLE  
IN  
INACTIVE  
INBOARD  
INCENTIVE  
INCH  
INCLUDE  
INCREASE  
INDICATE  
INDIVIDUAL  
INFECTION  
INFLUENCE  
INFORMATION  
INITIAL  
INJURE  
INJURY  
INNER  
INSIDE  
INSIGNIA  
INSPECT  
INSTALL  
INSTANCE  
INSTANT  
INSTEAD  
INSTRUCTION  
INSTRUMENT  
INSURANCE  
INTEGRITY  
INTELLIGENCE  
INTEND  
INTENSE  
INTENT  
INTERCEPT  
INTEREST

INTERFERE  
INTERIOR  
INTERMEDIATE  
INTERNAL  
INTERVAL  
INTO  
INTRODUCE  
INVESTIGATION  
INVOLVE  
IS  
ISOLATE  
ISSUE  
IT  
ITEM  
ITSELF  
JACK  
JACKBOX  
JACKET  
JAW  
JET  
JOB  
JOIN  
JOINT  
JUDGE  
JUMPER  
JUNIOR  
JURISDICTION  
JUST  
JUSTICE  
KEEP  
KEPT  
KEY  
KILL  
KIND  
KIT  
KNEE  
KNOCK  
KNOT  
KNOW  
KNOWLEDGE  
KNOWN  
LABORATORY  
LADDER  
LAID  
LAMP  
LAND  
LANDING  
LANGUAGE  
LARGE  
LAST

LATE  
LAUNCH  
LAUNCHER  
LAW  
LAWFUL  
LAY  
LEAD  
LEADER  
LEADERSHIP  
LEARN  
LEAST  
LEAVE  
LED  
LEE  
LEFT  
LEG  
LEGAL  
LENGTH  
LENS  
LESS  
LET  
LETTER  
LEVEL  
LIBERTY  
LIE  
LIEUTENANT  
LIFE  
LIFEBOAT  
LIFT  
LIGHT  
LIGHTERS  
LIGHTWEIGHT  
LIKE  
LIMIT  
LINE  
LINK  
LIQUID  
LIST  
LITTLE  
LIVE  
LIVES  
LOAD  
LOCAL  
LOCATE  
LOCATION  
LOCKER  
LOG  
LONG  
LOOK  
LOOKOUT

LOOP  
LOOSE  
LORAN  
LOSE  
LOSS  
LOST  
LOT  
LOW  
LOWER  
LUNG  
LYING  
MACHINE  
MADE  
MAGAZINE  
MAGNESIUM  
MAGNETIC  
MAIL  
MAIN  
MAINTAIN  
MAINTENANCE  
MAJOR  
MAJORITY  
MAKE  
MALE  
MAN  
MANAGEMENT  
MANEUVER  
MANNER  
MANUAL  
MANY  
MARCH  
MARINE  
MARK  
MARTIAL  
MASK  
MAST  
MASTER  
MATCH  
MATE  
MATERIAL  
MATTER  
MAXIMUM  
MAY  
MEAL  
MEAN  
MEASURE  
MECHANICAL  
MEDAL  
MEDICAL  
MEET

MEMBER  
MEN  
MENTAL  
MENTION  
MERCHANT  
MERELY  
MERITORIOUS  
MESS  
MESSAGE  
MESSENGER  
MESSING  
METAL  
METER  
METHOD  
MIDWAY  
MIGHT  
MILE  
MILITARY  
MIND  
MINE  
MINIMUM  
MINOR  
MINORITY  
MINUTE  
MISCONDUCT  
MISSILE  
MISSION  
MODERN  
MODIFY  
MONEY  
MONITOR  
MONKEY  
MONTH  
MOOR  
MORAL  
MORALE  
MORE  
MORNING  
MORPHINE  
MOST  
MOTION  
MOTOR  
MOUNT  
MOUTH  
MOVE  
MOVEMENT  
MUCH  
MUST  
MUSTARD  
MUSTER

MY  
NAKED  
NAME  
NAMEPLATE  
NARCOTIC  
NARROW  
NATION  
NATIONAL  
NATURAL  
NATURE  
NAUSEA  
NAUTICAL  
NAVAL  
NAVIGATION  
NAVY  
NEAR  
NEAT  
NECESSARILY  
NECK  
NEED  
NEEDLE  
NEITHER  
NERVE  
NERVOUS  
NEVER  
NEW  
NEXT  
NIGHT  
NINE  
NO  
NOISE  
NONCOMMISSIONED  
NOR  
NORMAL  
NORTH  
NOSE  
NOT  
NOTE  
NOTHING  
NOTICE  
NOW  
NOZZLE  
NUCLEAR  
NUMBER  
NUMEROUS  
NURSE  
NYLON  
O' CLOCK  
OBEY  
OBJECT

OBLIGATE  
OBSERVE  
OBTAIN  
OCCASION  
OCCUPATIONAL  
OCCUR  
OCEAN  
ODD  
OF  
OFF  
OFFENDER  
OFFENSE  
OFFICE  
OFFICER  
OFFICIAL  
OFTEN  
OIL  
OLD  
ON  
ONCE  
ONE  
ONLY  
OPEN  
OPENING  
OPERATE  
OPERATION  
OPERATOR  
OPPORTUNITY  
OPPOSITE  
ORAL  
ORAL  
ORDER  
ORDINARY  
ORDNANCE  
ORGANIZATION  
ORIGINAL  
OTHER  
OTHERWISE  
OUR  
OUT  
OUTBOARD  
OUTER  
OUTFIT  
OUTLET  
OUTLINE  
OUTSIDE  
OUTSTANDING  
OVER  
OVERBOARD  
OVERHEAD

OVERSEAS  
OWN  
OXYGEN  
PACIFIC  
PAD  
PAGE  
PAID  
PAIN  
PAINT  
PAINTER  
PAPER  
PARACHUTE  
PARALLEL  
PART  
PARTICIPATE  
PARTICLE  
PARTICULAR  
PARTY  
PASS  
PASSENGER  
PASSIVE  
PAST  
PATIENT  
PATROL  
PAY  
PAYGRADE  
PAYMENT  
PEACE  
PEACETIME  
PECULIAR  
PENNANT  
PEOPLE  
PER  
PERCENT  
PERFORM  
PERIOD  
PERIODICALLY  
PERMANENT  
PERMISSION  
PERMIT  
PERSON  
PERSONAL  
PERSONNEL  
PETTY  
PHASE  
PHONE  
PHONETIC  
PHYSICAL  
PICK  
PICTURE

PIECE  
PIER  
PILOT  
PIN  
PIPE  
PIPING  
PITCH  
PLACE  
PLAIN  
PLAN  
PLANE  
PLANT  
PLASTIC  
PLATFORM  
PLATING  
PLAY  
PLOT  
PLUG  
PLUS  
POCKET  
POINT  
POISON  
POISONOUS  
POLICE  
POLICY  
POOR  
PORT  
PORTABLE  
PORTION  
POSITION  
POSSESSION  
POSSIBILITY  
POSSIBLE  
POST  
POTENTIAL  
POUND  
POWDER  
POWER  
POWERFUL  
PRACTICAL  
PRECAUTION  
PRECEDENCE  
PRECEDING  
PREPARATION  
PREPARE  
PRESCRIBED  
PRESENCE  
PRESENT  
PRESERVATION  
PRESIDENT

PRESS  
PRESSURE  
PREVENT  
PRIMARILY  
PRIMARY  
PRINCIPAL  
PRINT  
PRIOR  
PRISONER  
PRIVATE  
PROBABLY  
PROBLEM  
PROCEDURE  
PROCEED  
PROCESS  
PRODUCE  
PROFESSIONAL  
PROGRAM  
PROHIBIT  
PROJECTILE  
PROMOTION  
PROMPT  
PROPEL  
PROPELLER  
PROPER  
PROPERTY  
PROPORTIONER  
PROPULSION  
PROTECT  
PROVIDE  
PROVISION  
PUBLIC  
PUBLICATION  
PULL  
PULSE  
PUMP  
PUNISH  
PUNISHMENT  
PURPOSE  
PUSH  
PUT  
QUALIFICATION  
QUALIFY  
QUARTER  
QUESTION  
QUICK  
QUIET  
RADAR  
RADIATION  
RADIO

RADIOACTIVE  
RAG  
RAINCOAT  
RAISE  
RAMP  
RANGE  
RANK  
RAPID  
RATE  
RATHER  
RATING  
RATION  
RAY  
REACH  
REACTOR  
READ  
READILY  
READINESS  
READY  
REAL  
REAR  
REASON  
REASONABLE  
RECEIPT  
RECEIVE  
RECOGNITION  
RECOMMEND  
RECORD  
RECOVERY  
RECRUIT  
RED  
REDUCE  
REDUCTION  
REENLIST  
REFER  
REGARDLESS  
REGULAR  
REGULATION  
REHABILITATION  
RELATE  
RELATIVE  
RELEASE  
RELIEF  
RELIEVE  
REMAIN  
REMEMBER  
REMOVE  
RENDER  
REPAIR  
REPEAT

REPLACE  
REPLENISHMENT  
REPORT  
REPRESENT  
REQUEST  
REQUIRE  
RESCUE  
RESEARCH  
RESERVE  
RESERVIST  
RESIST  
RESPECT  
RESPIRATION  
RESPONSIBILITY  
REST  
RESTRAINT  
RESTRICT  
RESULT  
RETIRE  
RETIREMENT  
RETURN  
REVEILLE  
REVERSE  
RIBBON  
RIFLE  
RIG  
RIGHT  
RING  
RISE  
RIVER  
RIVERINE  
ROCKET  
ROLL  
ROOM  
ROPE  
ROUGH  
ROUND  
ROUTINE  
RUBBER  
RUDDER  
RULE  
RUN  
RUST  
SABOTAGE  
SAFE  
SAFETY  
SAID  
SAILOR  
SALT  
SALUTE

SALVAGE  
SAME  
SANITATION  
SAVE  
SAY  
SCALE  
SCENE  
SCHEDULE  
SCHOOL  
SCOPE  
SCORE  
SCREW  
SEA  
SEAL  
SEAMAN  
SEAMANSHIP  
SEARCH  
SEAT  
SECOND  
SECONDARY  
SECRET  
SECRETARY  
SECTION  
SECTOR  
SECURE  
SECURITY  
SEE  
SEEK  
SEEM  
SEEN  
SEIZE  
SELDOM  
SELECT  
SELECTION  
SELECTOR  
SELF  
SEMAPHORE  
SEND  
SENIOR  
SENSE  
SENT  
SENTENCE  
SENTRY  
SEPARATE  
SEQUENCE  
SERIES  
SERIOUS  
SERVE  
SERVICE  
SET

SEVEN  
SEVERAL  
SEVERE  
SHAFT  
SHALL  
SHALLOW  
SHAPE  
SHARP  
SHE  
SHELL  
SHELTER  
SHIFT  
SHIP  
SHIPBOARD  
SHIPMATE  
SHIRT  
SHOCK  
SHOE  
SHOOT  
SHOP  
SHORE  
SHORT  
SHOT  
SHOULD  
SHOULDER  
SHOW  
SHOWN  
SICK  
SIDE  
SIGHT  
SIGN  
SIGNAL  
SIGNALMAN  
SIGNIFICANT  
SILENCE  
SIMILAR  
SIMPLE  
SIMPLY  
SINCE  
SINGLE  
SIR  
SISTER  
SITUATION  
SIX  
SIZE  
SKILL  
SKIN  
SKY  
SLACK  
SLEEVE

SLIDE  
SLIGHT  
SLING  
SLIP  
SLOW  
SMALL  
SMART  
SMOKE  
SMOOTH  
SNOW  
SO  
SOAP  
SOCIAL  
SOCKS  
SOFT  
SOLID  
SOLUTION  
SOLVENT  
SOME  
SOMEONE  
SOMETHING  
SOMETIMES  
SOMEWHAT  
SONAR  
SOON  
SOUND  
SOURCE  
SOUTH  
SPACE  
SPAN  
SPAR  
SPARE  
SPARK  
SPEAK  
SPECIAL  
SPECIFIC  
SPECIFY  
SPEED  
SPLICE  
SPLINT  
SPOKEN  
SPORT  
SPOT  
SPREAD  
SPRING  
SQUADRON  
SQUARE  
SQUEEZE  
STABILITY  
STAFF

STAGE  
STAND  
STANDARD  
STANDBY  
STAR  
STARBOARD  
START  
STATE  
STATEMENT  
STATION  
STATUS  
STAY  
STEADY  
STEAM  
STEEL  
STEER  
STEP  
STERILE  
STERN  
STILL  
STOMACH  
STOP  
STOPPER  
STORAGE  
STORE  
STORY  
STOW  
STOWAGE  
STRAIGHT  
STRAIN  
STRAND  
STRAP  
STRATEGIC  
STREAM  
STRENGTH  
STRETCHER  
STRIKE  
STRIKER  
STRIPE  
STRONG  
STRUCK  
STRUCTURAL  
STUDY  
STUFF  
SUBJECT  
SUBMARINE  
SUBMERGE  
SUBSEQUENT  
SUBSTANCE  
SUBSTITUTE

SUCCESSFUL  
SUCH  
SUCTION  
SUFFICIENT  
SUITABLE  
SUMMARY  
SUN  
SUNSET  
SUPERIOR  
SUPERSTRUCTURE  
SUPERVISE  
SUPPLEMENTARY  
SUPPLY  
SUPPORT  
SURE  
SURFACE  
SURGE  
SURRENDER  
SURVEY  
SURVIVAL  
SUSPEND  
SWEEP  
SWEEPER  
SWING  
SWITCH  
SWIVEL  
SYMBOL  
SYMPTOM  
SYNTHETIC  
SYSTEM  
TABLE  
TACTIC  
TACTICAL  
TAG  
TAKE  
TAKEN  
TALK  
TALKER  
TANK  
TAPS  
TARGET  
TASK  
TAUT  
TAX  
TEAM  
TECHNICAL  
TECHNIQUE  
TEETH  
TELEPHONE  
TELL

TEMPERATURE  
TEMPORARY  
TEN  
TEND  
TENDER  
TENSION  
TERM  
TEST  
THAN  
THAT  
THE  
THEIR  
THEM  
THEMSELVES  
THEN  
THERE  
THEREFORE  
THERMAL  
THESE  
THEY  
THICK  
THING  
THINK  
THIRD  
THIS  
THOROUGH  
THOSE  
THOUGH  
THOUSAND  
THREAD  
THREE  
THROAT  
THROUGH  
THROW  
THUS  
TIDE  
TIE  
TIGHT  
TIME  
TISSUE  
TITLE  
TO  
TODAY  
TOGETHER  
TOLERANCE  
TON  
TOO  
TOOL  
TOP  
TOPSIDE

TORPEDO  
TOTAL  
TOUCH  
TOUR  
TOURNIQUET  
TOW  
TOWARD  
TOXIC  
TRACK  
TRAFFIC  
TRAIN  
TRANSFER  
TRANSMISSION  
TRANSPORT  
TRASH  
TRAVEL  
TREAT  
TREATMENT  
TRIAL  
TRIED  
TRIGGER  
TROOP  
TROPICAL  
TROUBLE  
TROUSERS  
TRUE  
TRY  
TUBE  
TUG  
TUITION  
TURBINE  
TURN  
TWICE  
TWIN  
TWIST  
TWO  
TYPE  
TYPICAL  
UNABLE  
UNAUTHORIZED  
UNCOVER  
UNDER  
UNDERSTAND  
UNDERWATER  
UNIFORM  
UNIT  
UNITE  
UNLESS  
UNTIL  
UP

UPON  
UPPER  
UPWARD  
US  
USE  
USEFUL  
USER  
USUAL  
VALUE  
VALVE  
VAPOR  
VARIATION  
VARIETY  
VARIOUS  
VARY  
VEHICLE  
VELOCITY  
VENTILATE  
VERSION  
VERTICAL  
VERY  
VESSEL  
VETERAN  
VICE  
VICINITY  
VICTIM  
VIEW  
VIOLATION  
VISIBILITY  
VISIBLE  
VISION  
VISIT  
VISITOR  
VISUAL  
VITAL  
VOICE  
VOMIT  
WAIT  
WALK  
WANT  
WAR  
WARDROOM  
WARFARE  
WARM  
WARNING  
WARRANT  
WARSHIP  
WARTIME  
WAS  
WASH

WATCH  
WATER  
WATERLINE  
WATERTIGHT  
WAVE  
WAY  
WE  
WEAK  
WEAPON  
WEAR  
WEATHER  
WEEK  
WEIGHT  
WELDING  
WELL  
WERE  
WEST  
WET  
WHAT  
WHATEVER  
WHEEL  
WHEN  
WHENEVER  
WHERE  
WHEREAS  
WHETHER  
WHICH  
WHILE  
WHIP  
WHISTLE  
WHITE  
WHO  
WHOLE  
WHOM  
WHOSE  
WHY  
WIDE  
WILL  
WILLFUL  
WINCH  
WIND  
WINDLASS  
WING  
WIRE  
WITH  
WITHDRAWAL  
WITHIN  
WITHOUT  
WOMAN  
WOMEN

WOOD  
WOODEN  
WORD  
WORK  
WORLD  
WORN  
WOULD  
WOUND  
WRIST  
WRITTEN  
WRONG  
YARD  
YEAR  
YET  
YOLK  
YOU  
YOUNG  
YOUR  
YOURSELF  
ZEBRA  
ZERO  
ZONE

TAEG Report No. 83

APPENDIX C

THE SUPPLEMENTARY TECHNICAL LISTS

This appendix contains the root-word forms of the three supplementary lists: electronics, propulsion engineering, and administrative-clerical. The sources of the words in the lists are shown after the three lists at the end of the appendix.

Words marked with an asterisk are also found on the Common Word List (appendix A).

## ELECTRONICS LIST

AC	CONDUCTIVITY	FUSE
ACCUMULATION	CONDUCTOR*	GAUGE*
ACCURATE*	CONFIGURATION*	GENERATOR*
ADJACENT	CONNECTOR	GRID*
ALTERNATE*	CONTINUITY	GROUND*
ALTERNATION	CONTRAST*	GYRO
ALTERNATOR	CONTROL*	HENRY
AMMETER	CORE*	HERTZ
AMPERE*	COSINE	HYPOTENUSE
AMPLIFICATION	COUPLE*	ILLUMINATE*
AMPLIFIER*	CRYSTAL*	ILLUMINATION
AMPLITUDE*	CURRENT*	IMPEDANCE*
ANODE	CURSOR	INCANDESCENT
ANTENNA*	CUTOFF	INDUCE*
APPARENT	CYCLE*	INDUCTANCE
APPLIED	DC	INDUCTIVE
ARMATURE	DECIBEL*	INDUCTOR
ATOM*	DECIMAL*	INPHASE
ATTENUATE*	DEENERGIZE*	INSULATION*
ATTENUATOR	DEMODULATOR	INSULATOR
AUDIO	DETECTION*	INTEGRATE*
AUDIOFREQUENCY	DETECTOR	INTEGRATION
AVALANCHE	DIELECTRIC	INTENSITY*
B-PLUS	DIODE*	INTERFERENCE
BAND-PASS	DISCHARGE*	INVERSE
BASE*	DISCRIMINATOR	JUNCTION*
BATTERY*	DISPLAY*	LINEAR*
BIAS*	DISTORTION*	LOAD*
BLEEDER	ELECTRO-MAGNETIC	LOOP*
BRIDGE*	ELECTRODE*	MAGNET*
BRIGHTNESS*	ELECTROLYTIC	MAGNETIZE
BRUSH*	ELECTROMAGNET	MEGOhm
CALIBRATION	ELECTROMAGNETIC	METER*
CANDLEPOWER	ELECTROMAGNETISM	MICROAMPERE
CAPACITANCE*	ELECTROMOTIVE	MICROFARAD
CAPACITIVE	ELECTRON*	MICROMICROFARAD
CAPACITOR*	ELECTROSTATIC	MICROVOLT
CATHODE*	EMF	MILLIAMMETER
CATHODE-RAY	EMISSION	MILLIAMPERE
CELL*	EMIT	MILLIMICROAMPERE
CHASSIS	EMITTER	MILLIMICROFARAD
CHIP*	EXPONENT	MILLIMICROVOLT
CIRCUIT*	FARAD	MILLIVOLT
COAXIAL	FEEDBACK*	MINIATURE
COIL*	FIELD-EFFECT	MODULE*
COLLECTOR	FILAMENT	MOLECULE*
COMMUTATOR	FILTER*	MULTIMETER
CONDENSER*	FLUORESCENT	NANOAMPERE
CONDUCTANCE	FLUX	NANOFARAD
CONDUCTIVE	FREQUENCY*	NEGATIVE*

NEUTRAL\*  
NEUTRON  
NONLINEAR  
NUCLEUS  
OHM\*  
OHMIC  
OHMMETER  
ORBIT  
OSCILLATE  
OSCILLATOR\*  
OSCILLOSCOPE  
PARALLEL-CONNECT  
PEAK-TO-PEAK  
PENTODE  
PHOTODIODE  
PICOFARAD  
PLATE\*  
POSITIVE\*  
POTENTIOMETER  
PREAMPLIFIER  
PRESET  
PROBE  
PROTON  
RADARSCOPE  
RADIATING  
RADIOACTIVE\*  
RADIOACTIVITY  
RADIOFREQUENCY  
RADIUS\*  
RATIO\*  
REACTANCE\*  
REACTIVE  
RECEPTACLE\*  
RECHARGE  
RECHARGEABLE  
RECIPROCAL  
RECTIFICATION  
RECTIFIER  
RELAY\*  
REPEL  
RESET\*  
RESISTANCE\*  
RESISTIVE  
RESISTOR\*  
RESONANCE  
RESONANT  
RESULTANT  
RHEOSTAT  
RMS  
ROOT-MEAN-SQUARE

ROTOR\*  
SATURATION  
SCIENTIFIC  
SCREEN\*  
SEMICONDUCTOR  
SERIES\*  
SERIES-AIDING  
SERIES-PARALLEL  
SERVO\*  
SERVOMECHANISM  
SERVOSYSTEM  
SHORT-CIRCUITING  
SIGNAL-TO-NOISE  
SIMULATOR  
SINE  
SINE-WAVE  
SOLENOID\*  
SOLID-STATE  
SPECTRUM  
STATOR\*  
SUBSYSTEM\*  
SUPPRESSOR  
SWITCH\*  
TACH  
TACHMOMETER  
TANGENT  
TAP\*  
TECHNICIAN\*  
TETRODE  
THEORY\*  
THERMISTOR  
THERMOCOUPLE  
THREE-CONDUCTOR  
TOLERANCE\*  
TRANSFORMER\*  
TRANSISTOR  
TRANSIT  
TRIODE  
TUBE\*  
VACUUM-TUBE  
VOLT\*  
VOLT-AMPERE  
VOLTAGE\*  
VOLTMETER  
WATT\*  
WATTAGE  
WATTMETER  
WAVEFORM  
WAVELENGTH

PROPULSION ENGINEERING LIST

ABSORPTION	COOLANT	FLEXIBILITY
ACCUMULATOR	COOLER	FLUCTUATE
ADJUSTABLE	COOLING*	FLYWHEEL
AFTERBURNER	COTTER	FOG-FOAM
AIR-COOLED	COUNTER*	FOOT-POUND
ALL-PURPOSE	COUNTERCLOCKWISE*	FORCE*
ANNEAL*	COUNTERSINK	FREON
ANTIFRICTION	COUNTERWEIGHT	FRICTION*
APPLICATOR	COUPLING*	FUEL*
ASBESTOS	COVER*	FUME*
AXIAL-FLOW	COVERALL	FUNNEL
AXLE	CRANE	GAGE*
BACK-PRESSURE	CRANK*	GALVANIZE
BAFFLE	CYLINDER*	GAS*
BALL-PEEN	D-RING	GAS-GENERATOR
BAR*	DAMPER	GEAR*
BARREL*	DEAD-CENTER	GEAR-SHIFT
BEARING*	DEFUELING	GOGGLES*
BELT*	DEHUMIDIFICATION	GYRO
BEVEL	DEISEL-DRIVEN	HACKSAW
BIMETALLIC	DIAGONAL*	HAMMER*
BIT*	DIAPHRAGM*	HANDCRANK
BLOCK*	DIE*	HANDLE*
BLOWER	DIFFERENTIAL*	HANDWHEEL
BLUEPRINT*	DIFFUSER	HEAD*
BOLT*	DIRECT-DRIVEN	HELICAL
BOX-END	DISTANCE*	HIGH-PRESSURE
BRISTOL	DRAINAGE	HOIST*
BRONZE*	DRAWING*	HOSE*
BUCKLE*	DRILL*	HOUSING*
BURNER	DRIVEN*	HYDRAULICAL
BUSHING	DUPLEX	IDLER
CALIBRATION	EDGE*	IGNITE*
CAMLOC	EJECTOR	IGNITION*
CAMSHAFT	ELECTROHYDRAULIC	IMPELLER
CARTRIDGE*	ENERGY*	IMPULSE*
CASE*	ENGINE*	INCH*
CASING	EVAPORATION	INJECTION*
CENTRIFUGAL*	EXHAUST*	INJECTOR
CHAINFALL	EXTINGUISH*	INLET*
CHAMBER*	FASTENER*	INTAKE*
CHECK*	FEEDBACK*	JACK*
CHISEL	FEELER	JET*
CLEANER	FILTER*	JOINT*
CLUTCH*	FIREFIGHTER	KEY*
COMBUSTION*	FIREFIGHTING*	KEYWAY
COMPRESSION*	FIREPROOF	KINETIC
COMPRESSOR*	FIRING*	LABYRINTH
CONICAL	FIT*	LATERAL
CONSUMPTION	FIXED*	LEAKAGE*

LEVEL\*  
LEVER\*  
LIGHT-OFF  
LINE\*  
LIQUID-PROPELLANT  
LONG-NOSE  
LONGITUDINAL  
LUBRICANT\*  
MALLET  
MANHOLE  
MANIFOLD\*  
MANOMETER  
MERCURY\*  
METALLIC  
MICROMETER  
NEEDLE\*  
NOZZLE\*  
OIL\*  
PASSAGE\*  
PETCOCK  
PHILLIPS-HEAD  
PIN\*  
PIPE\*  
PIVOT  
PLIERS  
PLUG\*  
POINT\*  
PORT\*  
POUND\*  
POWER\*  
PRESSURE\*  
PRIMARY\*  
PRIME\*  
PROPELLER\*  
PUMP\*  
PUNCH\*  
PURIFY\*  
RATCHET  
RECHARGE  
RETAIN\*  
RETHREADING  
RING\*  
RISER  
POCKER  
ROD\*  
ROTATE\*  
ROTOR\*  
SATURATION  
SCREW\*  
SCREWDIVER\*

SECTION\*  
SELF-IGNITION  
SELF-PRIMING  
SET\*  
SETPOINT  
SETSCREW  
SHAFT\*  
SHEAR\*  
SLEEVE\*  
SLIDE\*  
SLIP-JOINT  
SLUDGE  
SOLENOID\*  
SPECIFICATION\*  
SPIRAL\*  
SPLASH-LUBRICATION  
SPLINE  
SPLIT-RING  
SPRING\*  
SPROCKET  
SPUR  
STEM\*  
STRAINER  
STROKE\*  
SUPERHEAT  
SUPPLY\*  
SYSTEM\*  
TANK\*  
TAP\*  
TEMPERATURE\*  
THREAD\*  
THRUST\*  
TOOL\*  
TORQUE\*  
TORSION  
TRAIN\*  
TURBINE\*  
TWO-VENTURI  
U-JOINT  
UNIT\*  
UNIVERSAL\*  
V-BELT  
VACUUM\*  
VALVE\*  
VANE  
VENTURI  
VISE-GRIP  
WALL\*  
WASHER  
WATER-COOLED

WATER-PUMP  
WELDING\*  
WHEEL\*  
WIRE\*  
WORK\*  
WRENCH\*  
YOKE

ADMINISTRATIVE-CLERICAL LIST

ABBREVIATION\*  
 ABSENCE\*  
 ABSENT\*  
 ACCESSIBLE  
 ACCOMPANY  
 ACCOMPLISHMENT  
 ACCOUNT\*  
 ACCOUNTABILITY  
 ACCUMULATION  
 ACHIEVE  
 ACTIVITY\*  
 ADAPT\*  
 ADAPTATION  
 ADD\*  
 ADDRESSEE  
 ADHERENCE  
 ADMIN  
 ADMINISTRATION\*  
 ADMINISTRATIVE\*  
 AFFIX  
 AFLOAT\*  
 AIR\*  
 ALPHABET\*  
 ALPHABETICAL  
 ANALYSIS\*  
 ANNUAL  
 APPLICABLE\*  
 APPROPRIATION  
 ARRANGEMENT\*  
 AUDIT\*  
 AUDITOR  
 AUTHORIZATION  
 AUTOMATE  
 BACK\*  
 BOTTOM\*  
 BOX\*  
 CALCULATION  
 CALL\*  
 CARBON\*  
 CARD\*  
 CHAIN\*  
 CLASSIFICATION\*  
 CLEAN\*  
 CODE\*  
 COMMAND\*  
 COMMUNICATION\*  
 COMPLIANCE  
 CONFIDENTIAL  
 CONSECUTIVE\*  
 CONSUMABLE

COPY\*  
 CORRECTION\*  
 COVER\*  
 CUSTODIAN  
 DEFINITION  
 DELEGATE  
 DELETE\*  
 DELETION  
 DEPARTURE  
 DEPLOY  
 DEPLOYMENT  
 DIAL\*  
 DIRECTIVE  
 DIRECTORY\*  
 DISAPPROVE  
 DISCRIMINATION  
 DOCUMENT\*  
 DOCUMENTATION  
 DOWNGRADE  
 DUPLICATE  
 ELECTRONIC\*  
 ENCLOSE  
 ERASER  
 EVALUATION\*  
 FEEDBACK\*  
 FEEDER  
 FILE\*  
 FINISH\*  
 FLUID\*  
 FOLDER  
 FRAME\*  
 FUND  
 HYPHENATE  
 INCORPORATE\*  
 INDENT  
 LETTERHEAD  
 LINE\*  
 LISTING  
 LOCAL\*  
 MACHINE\*  
 MAIL\*  
 MANUAL\*  
 MARGIN\*  
 MEMORANDUM  
 NOMENCLATURE  
 NUMBER\*  
 NUMERAL\*  
 NUMERICAL\*  
 OBJECTIVE  
 OFFICE\*

OPERATOR\*  
 ORDER\*  
 ORGANIZATIONAL  
 ORIGINATE  
 ORIGINATOR  
 OUTSTANDING\*  
 PAPER\*  
 PENCIL\*  
 PENDING  
 PERCENT\*  
 PERCENTAGE\*  
 POLITE  
 PRESERVATION\*  
 PROFESSION  
 PROFESSIONAL\*  
 PROFESSIONALISM  
 QUALIFICATION\*  
 QUOTA  
 READINESS\*  
 RECIPIENT  
 RECORDKEEPING  
 RECURE  
 RELIABLE\*  
 REPRODUCTION  
 RESPONSIBILITY\*  
 RETENTION  
 REUSABLE  
 ROUTE\*  
 SAFEGUARD  
 SECRET\*  
 SECURITY\*  
 SERIAL\*  
 SIGN\*  
 SIGNIFICANCE  
 SPACE\*  
 SPOOL  
 STAFF\*  
 STANDARDIZE  
 STAPLE  
 STAPLER  
 STATION\*  
 STATIONERY  
 STENCIL  
 SUBJ  
 SUBJECT\*  
 SUBMISSION  
 SUBORDINATE  
 SUBSYSTEM\*  
 SUPERVISOR\*  
 SUPERVISORY

SUPPLY\*  
SURVEY\*  
SURVEYOR  
SYMBOL\*  
TABLE\*  
TELEPHONE\*  
TEXT\*  
TISSUE\*  
TONE\*  
TYPE\*  
TYPEWRITER  
TYPIST  
UNAUTHORIZED\*  
UNCLASSIFIED  
UNSATISFACTORY\*  
URGENT  
UTILIZATION  
VERSUS  
VIA

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AND THE LIST CONTRIBUTED TO

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the Maintenance and Mechanics Occupational Category.)

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Clerical and Administrative Terminology. Student Text. Volumes  
6200-I,II,III. September 1975. American Language Course.  
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APPENDIX D

THE ARMY WORD SUBSTITUTION LIST WITH GRAMMATICAL VARIATIONS

This list resulted from expanding the 183 original words, with their substitutes, of the Army Word Substitution List, words originally found in Cir. 310-9, Headquarters Department of the Army. The expanded Army Word Substitution List contains 725 different word-substitute forms. This is the form of the Army List that was actually used in the computer readability editing system.

ACCOMPANIED	WENT WITH	
ACCOMPANIES	GOES WITH	
ACCOMPANY	GO WITH	
ACCOMPANYING	GOING WITH	
ACCOMPLISH	CARRY OUT	DO
ACCOMPLISHABLE	DOABLE	
ACCOMPLISHED	CARRIED OUT	DID/DONE
ACCOMPLISHES	CARRIES OUT	DOES
ACCOMPLISHING	CARRYING OUT	DOING
ACCORDINGLY	SO	
ACCRUAL	ADDITION	GAIN
ACCRUALS	ADDITIONS	GAINS
ACCRUE	ADD	GAIN
ACCRUED	ADDED	GAINED
ACCRUEMENT	ADDITION	GAIN
ACCRUES	ADDS	GAINS
ACCRUING	ADDING	GAINING
ACCURACY	CORRECTNESS	EXACTNESS
ACCURATE	CORRECT	EXACT
ACCURATELY	CORRECTLY	EXACTLY
ACHIEVABLE	DOABLE	MAKABLE
ACHIEVE	DO	MAKE
ACHIEVED	DID	MADE
ACHIEVES	DOES	MAKES
ACHIEVING	DOING	MAKING
ACTUAL	REAL	
ACTUALLY	REALLY	
ADDITIONAL	ADDED	MORE
ADVANTAGEOUS	HELPFUL	
ADVANTAGEOUSLY	HELPFULLY	
ADVISABLE	RECOMMENDABLE	
ADVISE	RECOMMEND	TELL
ADVISED	RECOMMENDED	TOLD
ADVISES	RECOMMENDS	TELLS
ADVISING	RECOMMENDING	TELLING
AFFIX	PUT	STICK
AFFIXED	PUT	STUCK
AFFIXES	PUTS	STICKS
AFFIXING	PUTTING	STICKING
AIRCRAFT	PLANE/PLANES	
AIRCRAFT'S	PLANE'S	
AIRCRAFTS'	PLANES'	
ANTICIPATABLE	EXPECTABLE	
ANTICIPATE	EXPECT	
ANTICIPATED	EXPECTED	
ANTICIPATES	EXPECTS	
ANTICIPATING	EXPECTING	
ANTICIPATION	EXPECTATION	
APPARENT	CLEAR	PLAIN
APPARENTLY	CLEARLY	PLAINLY
APPEAR	SEEM	
APPEARED	SEEMED	

APPEARING  
APPEARS  
APPRECIABLE  
APPROPRIATE  
APPROPRIATELY  
APPROXIMATELY  
ASCERTAIN  
ASCERTAINED  
ASCERTAINING  
ASCERTAINS  
ASSIST  
ASSISTANCE  
ASSISTED  
ASSISTING  
ASSISTS  
ATTEMPT  
ATTEMPTED  
ATTEMPTING  
ATTEMPTS  
BENEFICIAL  
BENEFICIARIES  
BENEFICIARY  
BENEFIT  
BENEFITED  
BENEFITER  
BENEFITERS  
BENEFITING  
BENEFITS  
BENEFITTED  
BENEFITTING  
CAPABILITIES  
CAPABILITIES'  
CAPABILITY  
CAPABILITY'S  
CATEGORIES  
CATEGORIES'  
CATEGORIZE  
CATEGORIZED  
CATEGORIZES  
CATEGORIZING  
CATEGORY  
CATEGORY'S  
COMBINE  
COMBINED  
COMBINES  
COMBINING  
COMPLIED  
COMPLIER  
COMPLIERS  
COMPLIES  
COMPLY  
COMPLYING

SEEKING  
SEEKS  
MAY  
PROPER  
PROPERLY  
ABOUT  
FIND OUT  
FOUND OUT  
FINDING OUT  
FINDS OUT  
AID  
AID  
AIDED  
AIDING  
AIDS  
TRY  
TRIED  
TRYING  
TRIES  
HELPFUL  
PERSONS HELPED  
PERSON HELPED  
HELP  
HELPED  
HELPER  
HELPERS  
HELPING  
HELPS  
HELPED  
HELPING  
ABILITIES  
ABILITIES'  
ABILITY  
ABILITY'S  
CLASSES  
CLASSES'  
CLASS  
CLASSED  
CLASSES  
CLASSING  
CLASS  
CLASS'S  
JOIN  
JOINED  
JOINS  
JOINING  
FOLLOWED  
FOLLOWER  
FOLLOWERS  
FOLLOWS  
FOLLOW  
FOLLOWING

RIGHT  
RIGHTLY

LEARN  
LEARNED  
LEARNING  
LEARNS  
HELP  
HELP  
HELPED  
HELPING  
HELPS

AM/ARE HELPED  
WAS HELPED

BEING HELPED  
IS HELPED  
WAS HELPED  
BEING HELPED

GROUPS  
GROUPS'  
GROUP  
GROUPED  
GROUPS  
GROUPING  
GROUP  
GROUP'S

COMPONENT	PART	
COMPONENT'S	PART'S	
COMPONENTS	PARTS	
COMPONENTS'	PARTS'	
COMPRISF	FORM	INCLUDE
COMPRISED	FORMED	INCLUDED
COMPRISES	FORMS	INCLUDES
COMPRISING	FORMING	INCLUDING
CONCERNING	ABOUT	ON
CONCLUDE	CLOSE	END
CONCLUDED	CLOSED	ENDED
CONCLUDES	CLOSES	ENDS
CONCLUDING	CLOSING	ENDING
CONCLUSION	CLOSE	END
CONCUR	AGREE	
CONCURRED	AGREED	
CONCURRENCE	AGREEMENT	
CONCURRING	AGREEING	
CONCURS	AGREES	
CONFRONT	FACE	MEET
CONFRONTATION	MEETING	
CONFRONTATIONS	MEETINGS	
CONFRONTED	FACED	MET
CONFRONTING	FACING	MEETING
CONFRONTS	FACES	MEETS
CONSEQUENTLY	SO	
CONSOLIDATE	COMBINE	JOIN
CONSOLIDATED	COMBINED	JOINED
CONSOLIDATES	COMBINES	JOINS
CONSOLIDATING	COMBINING	JOINING
CONSOLIDATION	COMBINATION	MERGER
CONSOLIDATOR	COMBINER	MERGER
CONSOLIDATORS	COMBINERS	MERGERS
CONSTITUTE	BE	FORM
CONSTITUTED	WAS	FORMED
CONSTITUTES	IS	FORMS
CONSTITUTING	BEING	FORMING
CONSTITUTION	FORM	MAKE-UP
CONSTRUCT	BUILD	
CONSTRUCTED	BUILT	
CONSTRUCTING	BUILDING	
CONSTRUCTOR	BUILDER	
CONSTRUCTS	BUILDS	
CONTAIN	HAVE	
CONTAINED	HAD	
CONTAINING	HAVING	
CONTAINS	HAS	
CONTINUE	KEEP ON	
CONTINUED	KEPT ON	
CONTINUES	KEEPS ON	
CONTINUING	KEEPING ON	
CONTRIBUTE	GIVE	

CONTRIBUTED  
CONTRIBUTES  
CONTRIBUTING  
CONTRIBUTION  
CONTRIBUTIONS  
CONTRIBUTIVELY  
CONTRIBUTOR  
CONTRIBUTORS  
CONTRIBUTORY  
COOPERATE  
COOPERATED  
COOPERATES  
COOPERATING  
COOPERATIVE  
COOPERATOR  
COOPERATORS  
DEEM  
DEEMED  
DEEMING  
DEEMS  
DELETE  
DELETED  
DELETES  
DELETING  
DELETION  
DEMONSTRABLE  
DEMONSTRATE  
DEMONSTRATED  
DEMONSTRATES  
DEMONSTRATING  
DEPART  
DEPARTED  
DEPARTING  
DEPARTS  
DESIGNATE  
DESIGNATED  
DESIGNATES  
DESIGNATING  
DESIRE  
DESIRED  
DESIRES  
DESIRING  
DESIROUSLY  
DESIROUSNESS  
DETERMINABLE  
DETERMINE  
DETERMINED  
DETERMINES  
DETERMINING  
DEVELOP  
DEVELOPED  
DEVELOPING

GAVE  
GIVES  
GIVING  
GIFT  
GIFTS  
GIVINGLY  
GIVER  
GIVERS  
GIVING  
HELP  
HELPED  
HELPS  
HELPING  
HELPFUL  
HELPER  
HELPERS  
THINK  
THOUGHT  
THINKING  
THINKS  
CUT  
CUT  
CUTS  
CUTTING  
CUTTING  
PROVABLE  
PROVE  
PROVED  
PROVES  
PROVING  
LEAVE  
LEFT  
LEAVING  
LEAVES  
APPOINT  
APPOINTED  
APPOINTS  
APPOINTING  
WISH  
WISHED  
WISHES  
WISHING  
WISHFULLY  
WISHFULNESS  
DECIDABLE  
DECIDE  
DECIDED  
DECIDES  
DECIDING  
GROW  
GREW/GROWN  
GROWING

DROP  
DROPPED  
DROPS  
DROPPING  
DROPPING

SHOW  
SHOWED  
SHOWS  
SHOWING

CHOOSE  
CHOSE/CHOSEN  
CHOOSES  
CHOOSING

FIGURABLE  
FIGURE  
FIGURED  
FIGURES  
FIGURING  
MAKE  
MADE  
MAKING

DEVELOPS  
DISCLOSE  
DISCLOSED  
DISCLOSES  
DISCLOSING  
DISCONTINUANCE  
DISCONTINUATION  
DISCONTINUE  
DISCONTINUED  
DISCONTINUES  
DISCONTINUING  
DISSEMINATE  
DISSEMINATED  
DISSEMINATES  
DISSEMINATING  
DISSEMINATION  
DISSEMINATOR  
DISSEMINATORS  
ECHELON  
ECHELON'S  
ECHELONS  
ECHELONS'  
EFFECTED  
EFFECTING  
ELECT  
ELECTED  
ELECTING  
ELECTS  
ELIMINATE  
ELIMINATED  
ELIMINATES  
ELIMINATING  
ELIMINATION  
EMPLOY  
EMPLOYED  
EMPLOYING  
EMPLOYMENT  
EMPLOYMENTS  
EMPLOYS  
ENCOUNTER  
ENCOUNTERED  
ENCOUNTERING  
ENCOUNTERS  
ENCOURAGE  
ENCOURAGED  
ENCOURAGES  
ENCOURAGING  
ENDEAVOR  
ENDEAVORED  
ENDEAVORING  
ENDEAVORS  
ENSURE

GROWS  
SHOW  
SHOWN  
SHOWS  
SHOWING  
DROPPING  
DROPPING  
DROP  
DROPPED  
DROPS  
DROPPING  
ISSUE  
ISSUED  
ISSUES  
ISSUING  
ISSUANCE  
ISSUER  
ISSUERS  
LEVEL  
LEVEL'S  
LEVELS  
LEVELS'  
MADE  
MAKING  
CHOOSE  
CHOSE/CHOSEN  
CHOOSING  
CHOOSES  
CUT  
CUT  
CUTS  
CUTTING  
CUTTING  
USE  
USED  
USING  
USE  
USES  
USES  
MEET  
MET  
MEETING  
MEETS  
URGE  
URGED  
URGES  
URGING  
TRY  
TRIED  
TRYING  
TRIES  
MAKE SURF

MAKES  
  
SHOWED  
  
STOPPING  
STOPPING  
STOP  
STOPPED  
STOPS  
STOPPING  
SEND OUT  
SENT OUT  
SENDS OUT  
SENDING OUT  
SENDING OUT  
  
PICK  
PICKED  
PICKING  
PICKS  
DROP  
DROPPED  
DROPS  
DROPPING  
DROPPING

ENSURED  
ENSURES  
ENSURING  
ENUMERATE  
ENUMERATED  
ENUMERATES  
ENUMERATING  
ENUMERATION  
ENUMERATIONS  
ENUMERATOR  
ENUMERATORS  
EQUITABLE  
EQUITABLY  
EQUIVALENT  
EQUIVALENTLY  
ESTABLISH  
ESTABLISHED  
ESTABLISHES  
ESTABLISHING  
EVALUATE  
EVALUATED  
EVALUATES  
EVALUATING  
EVALUATION  
EVALUATIONS  
EVALUATOR  
EVALUATORS  
EVIDENCED  
EVIDENCES  
EVIDENCING  
EVIDENT  
EXAMINATION  
EXAMINATIONS  
EXAMINE  
EXAMINED  
EXAMINES  
EXAMINING  
EXHIBIT  
EXHIBITED  
EXHIBITING  
EXHIBITION  
EXHIBITIONS  
EXHIBITS  
EXPEDITE  
EXPEDITED  
EXPEDITES  
EXPEDITING  
EXPEDITIOUS  
EXPEDITIOUSLY  
EXPEND  
EXPENDED  
EXPENDING

MADE SURE  
MAKES SURE  
MAKING SURE  
COUNT  
COUNTED  
COUNTS  
COUNTING  
COUNT  
COUNTS  
COUNTER  
COUNTERS  
FAIR  
FAIRLY  
EQUAL  
EQUALLY  
SET UP  
SET UP  
SETS UP  
SETTING UP  
CHECK  
CHECKED  
CHECKS  
CHECKING  
CHECK  
CHECKS  
CHECKER  
CHECKERS  
SHOWED  
SHOWS  
SHOWING  
CLEAR  
CHECK  
CHECKS  
CHECK  
CHECKED  
CHECKS  
CHECKING  
SHOW  
SHOWED  
SHOWING  
SHOW  
SHOWS  
SHOWS  
HURRY  
HURRIED  
HURRIES  
HURRYING  
FAST  
QUICKLY  
PAY OUT  
PAID OUT  
PAYING OUT

PROVE  
PROVED  
PROVES  
PROVING  
RATE  
RATED  
RATES  
RATING  
RATING  
RATINGS  
RATER  
RATERS

CHECKING

LOOK AT  
LOOKED AT  
LOOKS AT  
LOOKING AT

SHOWN

SHOWING  
SHOWINGS

RUSH  
RUSHED  
RUSHES  
RUSHING  
QUICK

SPEND  
SPENT  
SPENDING

EXPENDS  
EXPENSE  
EXPLAIN  
EXPLAINED  
EXPLAINING  
EXPLAINS  
FACILITATE  
FACILITATED  
FACILITATES  
FACILITATING  
FACILITATION  
FACTOR  
FACTOR'S  
FACTORS  
FACTORS'  
FEASIBLE  
FEMALE  
FEMALE'S  
FEMALES  
FEMALES'  
FINAL  
FINALIZATION  
FINALIZATIONS  
FINALIZE  
FINALIZED  
FINALIZES  
FINALIZING  
FORFEIT  
FORFEITED  
FORFEITING  
FORFEITS  
FORFEITURE  
FORFEITURES  
FORWARD  
FORWARDED  
FORWARDER  
FORWARDERS  
FORWARDING  
FORWARDS  
FUNCTION  
FUNCTIONED  
FUNCTIONING  
FUNCTIONS  
FUNDAMENTAL  
FUNDAMENTALLY  
FURNISH  
FURNISHED  
FURNISHER  
FURNISHERS  
FURNISHES  
FURNISHING  
HEREIN

PAYS OUT  
COST  
SHOW  
SHOWED  
SHOWING  
SHOWS  
EASE  
EASED  
EASES  
EASING  
HELP  
REASON  
REASON'S  
REASONS  
REASONS'  
CAN BE DONE  
WOMAN  
WOMAN'S  
WOMEN  
WOMEN'S  
LAST  
COMPLETION  
COMPLETIONS  
COMPLETE  
COMPLETED  
COMPLETES  
COMPLETING  
GIVE UP  
GAVE UP  
GIVING UP  
GIVES UP  
GIVING UP  
LOSINGS  
SEND  
SENT  
SENDER  
SENDERS  
SENDING  
SENDS  
ACT  
ACTED  
ACTING  
ACTS  
BASIC  
BASICALLY  
GIVE  
GAVE/GIVEN  
GIVER  
GIVERS  
GIVES  
GIVING  
HERE

SPENDS  
FEE  
TELL  
TOLD  
TELLING  
TELLS  
HELP  
HELPED  
HELPS  
HELPING  
HELPING  
CAUSE  
CAUSE'S  
CAUSES  
CAUSES'

FINISH  
FINISHINGS  
FINISH  
FINISHED  
FINISHES  
FINISHING  
LOSE  
LOST  
LOSING  
LOSES  
LOSS  
LOSSES

ROLE  
WORKED  
WORKING  
WORKS

SEND  
SENT  
SENDER  
SENDERS  
SENDS  
SENDING

HOWEVER  
IDENTICAL  
IDENTICALNESS  
IDENTIFIED  
IDENTIFIER  
IDENTIFIES  
IDENTIFY  
IDENTIFYING  
IMMEDIATELY  
IMPACTED  
IMPACTING  
IMPACTION  
IMPACTS  
IMPLEMENT  
IMPLEMENTATION  
IMPLEMENTED  
IMPLEMENTING  
IMPLEMENTS  
INCEPTION  
INCEPTION'S  
INCEPTIONS  
INCEPTIONS'  
INCORPORATE  
INCORPORATED  
INCORPORATES  
INCORPORATING  
INDICATE  
INDICATED  
INDICATES  
INDICATING  
INDICATION  
INDICATION'S  
INDICATIONS  
INDICATIONS'  
INITIAL  
INITIALIZATIONS  
INITIALIZE  
INITIALLY  
INITIATE  
INITIATED  
INITIATES  
INITIATING  
JUSTIFIED  
JUSTIFIES  
JUSTIFY  
JUSTIFYING  
LEGISLATION  
LEGISLATION'S  
LIMITATION  
LIMITATION'S  
LIMITATIONS  
LIMITATIONS'

BUT  
SAME  
SAMENESS  
FOUND  
FINDER  
FINDS  
FIND  
FINDING  
AT ONCE  
CHANGED  
CHANGING  
CHANGE  
CHANGES  
CARRY OUT  
CARRYING OUT  
CARRIED OUT  
CARRYING OUT  
CARRIES OUT  
START  
START'S  
STARTS  
STARTS'  
BLEND  
BLENDED  
BLENDS  
BLENDING  
SHOW  
SHOWED/SHOWN  
SHOWS  
SHOWING  
SIGN  
SIGN'S  
SIGNS  
SIGNS'  
FIRST  
STARTS  
START  
AT FIRST  
START  
STARTED  
STARTS  
STARTING  
PROVED/PROVEN  
PROVES  
PROVE  
PROVING  
LAW  
LAW'S  
LIMIT  
LIMIT'S  
LIMITS  
LIMITS'

NAMED

NAMES  
NAME  
NAMING

HIT  
HITTING  
HITTING  
HITS  
DO  
DOING  
DID  
DOING  
DOES

JOIN  
JOINED  
JOINS  
JOINING  
WRITE DOWN  
WRITEN DOWN  
WRITES DOWN  
WRITING DOWN

LAWS  
LAWS'



ALIGHTED  
ALIGHTS  
ALIGHTING  
OBSERVE  
OBSERVED  
OBSERVES  
OBSERVING  
OBTAIN  
OBTAINED  
OBTAINING  
OBTAINS  
OPERATE  
OPERATED  
OPERATES  
OPERATING  
OPERATIONAL  
OPTIMUM  
OPTION  
OPTION'S  
OPTIONS  
OPTIONS'  
PARTICIPATE  
PARTICIPATED  
PARTICIPATES  
PARTICIPATING  
PARTICIPATION  
PERFORM  
PERFORMED  
PERFORMING  
PERFORMS  
PERMIT  
PERMITS  
PERMITTED  
PERMITTING  
PERSONNEL  
PLACE  
PLACED  
PLACES  
PLACING  
PORTION  
PORTION'S  
PORTIONS  
PORTIONS'  
POSITION  
POSITIONED  
POSITIONING  
POSITIONS  
POSSESS  
POSSESSED  
POSSESSES  
POSSESSING  
PRECLUDE

BOUND  
BINDS  
BINDING  
SEE  
SAW  
SEES  
SEEING  
GET  
GOT/GOTTEN  
GETTING  
GETS  
RUN  
RAN/RUN  
RUNS  
RUNNING  
WORKING  
BEST  
CHOICE  
CHOICE'S  
CHOICES  
CHOICES'  
TAKE PART  
TOOK PART  
TAKES PART  
TAKING PART  
TAKING PART  
DO  
DID/DONE  
DOING  
DOES  
LET  
LETS  
LET  
LETTING  
PEOPLE  
PUT  
PUT  
PUTS  
PUTTING  
PART  
PART'S  
PARTS  
PARTS'  
PLACE  
PLACED  
PLACING  
PLACES  
HAVE  
HAD  
HAS  
HAVING  
PREVENT

COMPELLED  
COMPELS  
COMPELLING

SEEN

WORK  
WORKED  
WORKS  
WORKING

GREATEST  
WAY  
WAY'S  
WAYS  
WAYS'

TAKEN PART

STAFF

OWN  
OWNED  
OWNS  
OWNING

PRECLUDED	PREVENTED	
PRECLUDES	PREVENTS	
PRECLUDING	PREVENTING	
PREPARATION	READINESS	
PREPARE	GET READY	READY
PREPARED	READY	READYED
PREPAREDLY	READILY	
PREPAREDNESS	READINESS	
PREPARES	READIES	
PREPARING	GETTING READY	
PREVIOUS	EARLIER	PAST
PREVIOUSLY	BEFORE	
PRIORIZATION	RANKING	
PRIORIZATIONS	RANKINGS	
PRIORIZE	RANK	
PRIORIZED	RANKED	
PRIORIZES	RANKS	
PRIORIZING	RANKING	
PROBABILITIES	CHANCES	
PROBABILITIES'	CHANCES'	
PROBABILITY	CHANCE	
PROBABILITY'S	CHANCE'S	
PROCEDURE	RULE	WAY
PROCEDURE'S	RULE'S	WAY'S
PROCEDURES	RULES	WAYS
PROCEDURES'	RULES'	WAYS'
PROCEED	DO	GO ON
PROCEEDED	DID/DONE	WENT/GONE ON
PROCEEDING	DOING	GOING ON
PROCEEDS	DOES	GOES ON
PROFICIENCIES	SKILLS	
PROFICIENCIES'	SKILLS'	
PROFICIENCY	SKILL	
PROFICIENCY'S	SKILL'S	
PROGRAMED	PLANNED	
PROGRAMING	PLANNING	
PROGRAMMED	PLANNED	
PROGRAMMING	PLANNING	
PROGRAMS	PLANS	
PROMULGATE	ANNOUNCE	ISSUE
PROMULGATED	ANNOUNCED	ISSUED
PROMULGATES	ANNOUNCES	ISSUES
PROMULGATING	ANNOUNCING	ISSUING
PROMULGATION	ANNOUNCEMENT	
PROMULGATIONS	ANNOUNCEMENTS	
PROVIDE	GIVE	SAY
PROVIDED	GAVE/GIVEN	SAID
PROVIDES	GIVES	SAYS
PROVIDING	GIVING	SAYING
PURCHASE	BUY	
PURCHASED	BOUGHT	
PURCHASER	BUYER	

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TRAINING ANALYSIS AND EVALUATION GROUP (NAVY) ORLANDO FL F/G 5/2  
DEVELOPMENT AND TEST OF A COMPUTER READABILITY EDITING SYSTEM (--ETC(U)  
MAR 80 J P KINCAID, J A AAGARD, J W O'HARA

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PURCHASERS  
PURCHASES  
PURCHASING  
RECAPITULATE  
RECAPITULATED  
RECAPITULATES  
RECAPITULATING  
RECAPITULATION  
REDUCE  
REDUCED  
REDUCES  
REDUCING  
REDUCTION  
REDUCTIONS  
REFLECT  
REFLECTED  
REFLECTING  
REFLECTS  
REGARDING  
RELOCATE  
RELOCATED  
RELOCATES  
RELOCATING  
RELOCATION  
RELOCATION'S  
RELOCATIONS  
RELOCATIONS'  
REMAIN  
REMAINDER  
REMAINDER'S  
REMAINED  
REMAINES  
REMAINING  
REMUNERATE  
REMUNERATED  
REMUNERATES  
REMUNERATING  
REMUNERATION  
REMUNERATION'S  
REMUNERATIONS  
REMUNERATIONS'  
RENDER  
RENDERABLE  
RENDERED  
RENDERER  
RENDERING  
RENDERS  
REQUEST  
REQUESTED  
REQUESTING  
REQUESTS  
REQUIRE

BUYERS  
BUYS  
BUYING  
SUM UP  
SUMMED UP  
SUMS UP  
SUMMING UP  
SUMMING UP  
CUT  
CUT  
CUTS  
CUTTING  
CUT  
CUTS  
SAY  
SAID  
SAYING  
SAYS  
ABOUT  
MOVE  
MOVED  
MOVES  
MOVING  
MOVE  
MOVE'S  
MOVES  
MOVES'  
STAY  
REST  
REST'S  
STAYED  
STAYS  
STAYING  
PAY  
PAID  
PAYS  
PAYING  
PAY  
PAY'S  
PAYMENTS  
PAYMENTS'  
GIVE  
GIVABLE  
GAVE/GIVEN  
GIVER  
GIVING  
GIVES  
ASK  
ASKED  
ASKING  
ASKS  
JUST

SHOW  
SHOWED  
SHOWING  
SHOWS  
OF

MAKE  
MAKABLE  
MADE  
MAKER  
MAKING  
MAKES

NEED

REQUIRED  
REQUIREMENT  
REQUIREMENT'S  
REQUIREMENTS  
REQUIRES  
REQUIRING  
RETAIN  
RETAINED  
RETAINING  
RETAINS  
RETENTION  
RETURN  
RETURNED  
RETURNEE  
RETURNEES  
RETURNER  
RETURNERS  
RETURNING  
RETURNS  
REVIEW  
REVIEWED  
REVIEWING  
REVIEWS  
SELECT  
SELECTED  
SELECTING  
SELECTION  
SELECTION'S  
SELECTIONS  
SELECTIONS'  
SELECTS  
SIMILAR  
SIMILARITY  
SOLICIT  
SOLICITED  
SOLICITING  
SOLICITS  
STATE  
STATED  
STATES  
STATING  
SUBMIT  
SUBMITS  
SUBMITTED  
SUBMITTER  
SUBMITTERS  
SUBMITTING  
SUBSEQUENT  
SUBSEQUENTLY  
SUBSTANTIAL  
SUFFICIENT  
TERMINATE

NEEDED  
NEED  
NEED'S  
NEEDS  
NEEDS  
NEEDING  
KEEP  
KEPT  
KEEPING  
KEEPS  
KEEPING  
GO BACK  
WENT BACK  
ONE WHO GOES BACK  
THOSE WHO COME BACK  
ONE WHO TAKES BACK  
THOSE WHO TAKE BACK  
GOING BACK  
GOES BACK  
CHECK  
CHECKED  
CHECKING  
CHECKS  
CHOOSE  
CHOSE/CHOSEN  
CHOOSING  
CHOICE  
CHOICE'S  
CHOICES  
CHOICES'  
CHOOSES  
LIKE  
LIKENESS  
ASK FOR  
ASKED FOR  
ASKING FOR  
ASKS FOR  
SAY  
SAID  
SAYS  
SAYING  
GIVE  
GIVES  
GAVE/GIVEN  
GIVER  
GIVERS  
GIVING  
LATER  
AFTER  
LARGE  
ENOUGH  
END

GONE BACK

GO OVER  
WENT/GONE OVER  
GOING OVER  
GOES OVER

SEND  
SENDS  
SENT  
SENDER  
SENDERS  
SENDING  
NEXT  
LATER  
REAL

STOP

TERMINATED  
TERMINATES  
TERMINATING  
TERMINATION  
TERMINATIONS  
THEREFORE  
THEREOF  
TRANSMIT  
TRANSMITS  
TRANSMITTABLE  
TRANSMITTED  
TRANSMITTING  
TRANSPIRATION  
TRANSPIRATIONS  
TRANSPIRE  
TRANSPIRED  
TRANSPIRES  
TRANSPIRING  
UTILIZABILITIES  
UTILIZABILITY  
UTILIZABLE  
UTILIZATION  
UTILIZATIONS  
UTILIZE  
UTILIZED  
UTILIZER  
UTILIZERS  
UTILIZES  
UTILIZING  
VALIDATE  
VALIDATED  
VALIDATES  
VALIDATING  
VALIDATION  
VALIDATIONS  
VALUE  
VERBATIM  
VIA  
VIABLE  
WARRANT  
WARRANTED  
WARRANTING  
WARRANTS  
WHENEVER  
WHEREAS  
WITNESS  
WITNESSED  
WITNESSES  
WITNESSING

ENDED  
ENDS  
ENDING  
ENDING  
ENDING  
SO  
ITS  
SEND  
SENDS  
SENDABLE  
SENT  
SENDING  
HAPPENING  
HAPPENINGS  
HAPPEN  
HAPPENED  
HAPPENS  
HAPPENING  
USES  
USABILITY  
USABLE  
USE  
USES  
USE  
USED  
USER  
USERS  
USES  
USING  
CONFIRM  
CONFIRMED  
CONFIRMS  
CONFIRMING  
CONFIRMATION  
CONFIRMATIONS  
COST  
WORD FOR WORD  
IN  
WORKABLE  
CALL FOR  
CALLED FOR  
CALLING FOR  
CALLS FOR  
WHEN  
SINCE  
SEE  
SAW  
SEES  
SEEING

STOPPED  
STOPS  
STOPPING

THEIR

OCCURRENCE  
OCCURRENCES  
OCCUR  
OCCURRED  
OCCURS  
OCCURRING

USEFULNESS  
USEFUL

WORTH  
EXACT  
ON

PERMIT  
PERMITTED  
PERMITTING  
PERMITS

SEEN

TAEG Report No. 83

APPENDIX E

THE NAVY VERB LIST WITH VERB VARIATIONS

This list resulted from expanding the 108 root verbs of the Navy Verb List with their substitutes. The root verbs were originally found in DOD-STD-1685(SH). The expanded Navy Verb List contains 431 different verb-substitute forms. These forms of the Navy Verb List were actually used in the Computer Readability Editing System.

Word to be Substituted	First Substitute	Second Substitute
ACCOMPLISH	PERFORM	DO
ACCOMPLISHED	PERFORMED	DID/DONE
ACCOMPLISHES	PERFORMS	DOES
ACCOMPLISHING	PERFORMING	DOING
ACTUATE	OPERATE	MOVE
ACTUATED	OPERATED	MOVED
ACTUATES	OPERATES	MOVES
ACTUATING	OPERATING	MOVING
ADVANCE	MOVE FOWARD	MOVE AHEAD
ADVANCED	MOVED FORWARD	MOVED AHEAD
ADVANCES	MOVES FORWARD	MOVES AHEAD
ADVANCING	MOVING FOWARD	MOVING AHEAD
ADVISE	REPORT TO	TELL
ADVISED	REPORTED TO	TOLD
ADVISES	REPORTS TO	TELLS
ADVISING	REPORTING TO	TELLING
AGITATE	SHAKE	
AGITATED	SHOOK/SHAKEN	
AGITATES	SHAKES	
AGITATING	SHAKING	
AID	HELP	
AIDED	HELPED	
AIDING	HELPING	
AIDS	HELPS	
ALERT	WARN	
ALERTED	WARNED	
ALERTING	WARNING	
ALERTS	WARNS	
ALLOCATE	ASSIGN	DISTRIBUTE
ALLOCATED	ASSIGNED	DISTRIBUTED
ALLOCATES	ASSIGNS	DISTRIBUTES
ALLOCATING	ASSIGNING	DISTRIBUTING
ALLOW	LET	WAIT FOR
ALLOWED	LET	WAITED FOR
ALLOWING	LETTING	WAITING FOR
ALLWS	LETS	WAITS FOR
ALTERNATE	GO BACK AND FORTH	
ALTERNATED	WENT BACK AND FORTH	GONE BACK AND FORTH
ALTERNATES	GUES BACK AND FORTH	
ALTERNATING	GOING BACK AND FORTH	
ANALYZE	THINK ABOUT	
ANALYZED	THOUGHT ABOUT	
ANALYZES	THINKS ABOUT	
ANALYZING	THINKING ABOUT	
ARRANGE	PUT IN ORDER	
ARRANGED	PUT IN ORDER	
ARRANGES	PUTS IN ORDER	
ARRANGING	PUTTING IN ORDER	
ASCERTAIN	BE SURE	
ASCERTAINED	WAS/WERE SURE	
ASCERTAINING	BEING SURE	
ASCERTAINS	IS SURE	

Word to be Substituted	First Substitute	Second Substitute
ASSESS	EVALUATE	
ASSESSED	EVALUATED	
ASSESSES	EVALUATES	
ASSESSING	EVALUATING	
ASSIST	HELP	
ASSISTED	HELPED	
ASSISTING	HELPING	
ASSISTS	HELPS	
ASSURE	TELL	REPORT TO
ASSURED	TOLD	REPORTED TO
ASSURES	TELLS	REPORTS TO
ASSURING	TELLING	REPORTING TO
CATEGORIZE	CLASSIFY	
CATEGORIZED	CLASSIFIED	
CATEGORIZES	CLASSIFIES	
CATEGORIZING	CLASSIFYING	
CHANGE	REPLACE	MODIFY
CHANGED	REPLACED	MODIFIED
CHANGES	REPLACES	MODIFIES
CHANGING	REPLACING	MODIFYING
CHANNEL	FORM	CUT
CHANNELED	FORMED	CUT
CHANNELING	FORMING	CUTTING
CHANNELLED	FORMED	CUT
CHANNELLING	FORMING	CUTTING
CHANNELS	FORMS	CUTS
CHECK	BE SURE	
CHECKED	WAS/WERE SURE	
CHECKING	BEING SURE	
CHECKS	IS SURE	
COMMUNICATE	REPORT TO	TELL
COMMUNICATED	REPORTED TO	TOLD
COMMUNICATES	REPORTS TO	TELLS
COMMUNICATING	REPORTING TO	TELLING
COMPILE	COLLECT	
COMPILED	COLLECTED	
COMPILES	COLLECTS	
COMPILING	COLLECTING	
COMPLIED	FOLLOWED	
COMPLIES	FOLLOWS	
COMPLY	FOLLOW	
COMPLYING	FOLLOWING	
COMPUTE	CALCULATE	
COMPUTED	CALCULATED	
COMPUTES	CALCULATES	
COMPUTING	CALCULATING	
CONFER	ASK	
CONFERRED	ASKED	
CONFERRING	ASKING	
CONFERS	ASKS	
CONSTRUCT	MAKE	BUILD
CONSTRUCTED	MADE	BUILT

Word to be Substituted	First Substitute	Second Substitute
CONSTRUCTING	MAKING	BUILDING
CONSTRUCTS	MAKES	BUILDS
DEPRESS	PRESS	PUSH
DEPRESSED	PRESSED	PUSHED
DEPRESSES	PRESSES	PUSHES
DEPRESSING	PRESSING	PUSHING
DEPRESSURIZE	RELEASE PRESSURE	
DEPRESSURIZED	RELEASED PRESSURE	
DEPRESSURIZES	RELEASES PRESSURE	
DEPRESSURIZING	RELEASING PRESSURE	
DETERMINE	MEASURE	BE SURE
DETERMINED	MEASURED	WAS/WERE SURE
DETERMINES	MEASURES	IS SURE
DETERMINING	MEASURING	BEING SURE
DISCONNECT	UNPLUG	
DISCONNECTED	UNPLUGGED	
DISCONNECTING	UNPLUGGING	
DISCONNECTS	UNPLUGS	
DISENGAGE	RELEASE	UNLOCK
DISENGAGED	RELEASED	UNLOCKED
DISENGAGES	RELEASES	UNLOCKS
DISENGAGING	RELEASING	UNLOCKING
DISMANTLE	DISASSEMBLE	
DISMANTLED	DISASSEMBLED	
DISMANTLES	DISASSEMBLES	
DISMANTLING	DISASSEMBLING	
DISPATCH	SEND	
DISPATCHED	SENT	
DISPATCHES	SENDS	
DISPATCHING	SENDING	
DISTRIBUTE	HAND OUT	SPREAD OUT
DISTRIBUTED	HANDED OUT	SPREAD OUT
DISTRIBUTES	HANDS OUT	SPREADS OUT
DISTRIBUTING	HANDING OUT	SPREADING OUT
EFFECT	PERFORM	DO
EFFECTED	PERFORMED	DID/DONE
EFFECTING	PERFORMING	DOING
EFFECTS	PERFORMS	DOES
ELIMINATE	GET RID OF	
ELIMINATED	GOT/GOTTEN RID OF	
ELIMINATES	GETS RID OF	
ELIMINATING	GETTING RID OF	
EMPLOY	USE	
EMPLOYED	USED	
EMPLOYING	USING	
EMPLOYS	USES	
ENSURE	BE SURE	
ENSURED	WAS/WERE SURE	
ENSURES	IS SURE	
ENSURING	BEING SURE	
ENTER	GO IN	COME IN
ENTERED	WENT/GONE IN	CAME IN

Word to be Substituted	First Substitute	Second Substitute
ENTERING	GOING IN	COMING IN
ENTERS	GOES IN	COMES IN
ERECT	SET UP	PUT TOGETHER
ERECTED	SET UP	PUT TOGETHER
ERECTING	SETTING UP	PUTTING TOGETHER
ERECTS	SETS UP	PUTS TOGETHER
EXAMINE	INSPECT	
EXAMINED	INSPECTED	
EXAMINES	INSPECTS	
EXAMINING	INSPECTING	
EXTEND	STRETCH OUT	MAKE LONGER
EXTENDED	STRETCHED OUT	MADE LONGER
EXTENDING	STRETCHING OUT	MAKING LONGER
EXTENDS	STRETCHES OUT	MAKES LONGER
EXTRACT	PULL OUT	
EXTRACTED	PULLED OUT	
EXTRACTING	PULLING OUT	
EXTRACTS	PULLS OUT	
FABRICATE	MAKE	BUILD
FABRICATED	MADE	BUILT
FABRICATES	MAKES	BUILDS
FABRICATING	MAKING	BUILDING
FIGURE	CALCULATE	
FIGURED	CALCULATED	
FIGURES	CALCULATES	
FIGURING	CALCULATING	
FIND	MEASURE	
FINDING	MEASURING	
FINDS	MEASURES	
FOUND	MEASURED	
FURNISH	GIVE	
FURNISHED	GAVE/GIVEN	
FURNISHES	GIVES	
FURNISHING	GIVING	
GUIDE	INSERT CAREFULLY	
GUIDED	INSERTED CAREFULLY	
GUIDES	INSERTS CAREFULLY	
GUIDING	INSERTING CAREFULLY	
IMMERSE	SUBMERGE	
IMMERSED	SUBMERGED	
IMMERSES	SUBMERGES	
IMMERSING	SUBMERGING	
INDICATE	POINT OUT	TELL
INDICATED	POINTED OUT	TOLD
INDICATES	POINTS OUT	TELLS
INDICATING	POINTING OUT	TELLING
INFORM	TELL	REPORT TO
INFORMED	TOLD	REPORTED TO
INFORMING	TELLING	REPORTING TO
INFORMS	TELLS	REPORTS TO
INITIATE	START	BEGIN
INITIATED	STARTED	BEGAN/BEGUN

Word to be Substituted	First Substitute	Second Substitute
INITIATES	STARTS	BEGINS
INITIATING	STARTING	BEGINNING
INJECT	FORCE	
INJECTED	FORCED	
INJECTING	FORCING	
INJECTS	FORCES	
INSURE	BE SURE	
INSURED	WAS/WERE SURE	
INSURES	IS SURE	
INSURING	BEING SURE	
INTERPRET	EXPLAIN	
INTERPRETED	EXPLAINED	
INTERPRETING	EXPLAINING	
INTERPRETS	EXPLAINS	
JOIN	ATTACH	CONNECT
JOINED	ATTACHED	CONNECTED
JOINING	ATTACHING	CONNECTING
JOINS	ATTACHES	CONNECTS
LOCATE	FIND	
LOCATED	FOUND	
LOCATES	FINDS	
LOCATING	FINDING	
MARK	TAG	
MARKED	TAGGED	
MARKING	TAGGING	
MARKS	TAGS	
MATE	ATTACH	CONNECT
MATED	ATTACHED	CONNECTED
MATES	ATTACHES	CONNECTS
MATING	ATTACHING	CONNECTING
MONITOR	WATCH	
MONITORED	WATCHED	
MONITORING	WATCHING	
MONITORS	WATCHES	
MOUNT	INSTALL	ATTACH
MOUNTED	INSTALLED	ATTACHED
MOUNTING	INSTALLING	ATTACHING
MOUNTS	INSTALLS	ATTACHES
NOTIFIED	REPORTED TO	TOLD
NOTIFIES	REPORTS TO	TELLS
NOTIFY	REPORT TO	TELL
NOTIFYING	REPORTING TO	TELLING
OBSERVE	WATCH	OBEY
OBSERVED	WATCHED	OBEYED
OBSERVES	WATCHES	OBEYS
OBSERVING	WATCHING	OBEYING
OBTAIN	GET	
OBTAINED	GOT/GOTTEN	
OBTAINING	GETTING	
OBTAINS	GETS	
ORDER	PUT IN ORDER	REQUISITION
ORDERED	PUT IN ORDER	REQUISITIONED

Word to be Substituted	First Substitute	Second Substitute
ORDERING	PUTTING IN ORDER	REQUISITIONING
ORDERS	PUTS IN ORDER	REQUISITIONS
ORIENT	PUT	SET
ORIENTED	PUT	SET
ORIENTING	PUTTING	SETTING
ORIENTS	PUTS	SETS
ORIGINATE	START	
ORIGINATED	STARTED	
ORIGINATES	STARTS	
ORIGINATING	STARTING	
PLACE	PUT	SET
PLACED	PUT	SET
PLACES	PUTS	SETS
PLACING	PUTTING	SETTING
POSITION	PUT	SET
POSITIONED	PUT	SET
POSITIONING	PUTTING	SETTING
POSITIONS	PUTS	SETS
PRE-SET	SET	
PRE-SETS	SETS	
PRE-SETTING	SETTING	
PROVIDE	GIVE	
PROVIDED	GAVE/GIVEN	
PROVIDES	GIVES	
PROVIDING	GIVING	
READYED	PREPARED	
READIES	PREPARES	
READJUST	ADJUST	
READJUSTED	ADJUSTED	
READJUSTING	ADJUSTING	
READJUSTS	ADJUSTS	
READY	PREPARE	
READYING	PREPARING	
REASSEMBLE	ASSEMBLE	
REASSEMBLED	ASSEMBLED	
REASSEMBLES	ASSEMBLES	
REASSEMBLING	ASSEMBLING	
RECAP	CAP	
RECAPPED	CAPPED	
RECAPPING	CAPPING	
RECAPS	CAPS	
RECEIVE	GET	
RECEIVED	GOT/GOTTEN	
RECEIVES	GETS	
RECEIVING	GETTING	
RECONNECT	CONNECT	
RECONNECTED	CONNECTED	
RECONNECTING	CONNECTING	
RECONNECTS	CONNECTS	
RECORD	WRITE	WRITE IN
RECORDED	WROTE/WRITTEN	WROTE/WRITTEN IN
RECORDING	WRITTING	WRITTING IN

Word to be Substituted	First Substitute	Second Substitute
RECORDS	WRITES	WRITES IN
REINFLATE	INFLATE	
REINFLATED	INFLATED	
REINFLATES	INFLATES	
REINFLATING	INFLATING	
REINSTALL	INSTALL	
REINSTALLED	INSTALLED	
REINSTALLING	INSTALLING	
REINSTALLS	INSTALLS	
REJECT	DO NOT USE	DESTROY
REJECTED	DID NOT USE	DESTROYED
REJECTING	IS/WAS NOT USING	DESTROYING
REJECTS	DOES NOT USE	DESTROYS
RELAY	GIVE	TELL
RELAYED	GAVE/GIVEN	TOLD
RELAYING	GIVING	TELLING
RELAYS	GIVES	TELLS
RELIEVE	REDUCE	
RELIEVED	REDUCED	
RELIEVES	REDUCES	
RELIEVING	REDUCING	
REPLACE	PUT BACK	INSTALL NEW
REPLACED	PUT BACK	INSTALLED NEW
REPLACES	PUTS BACK	INSTALLS NEW
REPLACING	PUTTING BACK	INSTALLING NEW
REPRESSURIZE	PRESSURIZE	
REPRESSURIZED	PRESSURIZED	
REPRESSURIZES	PRESSURIZES	
REPRESSURIZING	PRESSURIZING	
REQUEST	ASK FOR	
REQUESTED	ASKED FOR	
REQUESTING	ASKING FOR	
REQUESTS	ASKS FOR	
RESET	SET	
RESETS	SETS	
RESETTING	SETTING	
RETARD	HOLD BACK	SLOW DOWN
RETARDED	HELD BACK	SLOWED DOWN
RETARDING	HOLDING BACK	SLOWING DOWN
RETARDS	HOLDS BACK	SLOWS DOWN
RETRACT	PULL BACK	
RETRACTED	PULLED DOWN	
RETRACTING	PULLING DOWN	
RETRACTS	PULLS BACK	
ROTATE	TURN	
ROTATED	TURNE	
ROTATES	URNS	
ROTATING	TURNING	
ROUTE	SEND	
ROUTED	SENT	
ROUTES	SENDS	
ROUTING	SENDING	

Word to be Substituted	First Substitute	Second Substitute
SCAN	WATCH	
SCANNED	WATCHED	
SCANNING	WATCHING	
SCANS	WATCHES	
SELECT	CHOOSE	
SELECTED	CHOSE/CHOSEN	
SELECTING	CHOOSING	
SELECTS	CHOOSES	
STOP	SHUT DOWN	
STOPPED	SHUT DOWN	
STOPPING	SHUTTING DOWN	
STOPS	SHUTS DOWN	
STRICKEN	HIT	
STRICKING	HITTING	
STRIKE	HIT	
STRIKES	HITS	
STRUCK	HIT	
SUPERINTEND	SUPERVISE	
SUPERINTENDED	SUPERVISED	
SUPERINTENDING	SUPERVISING	
SUPERINTENDS	SUPERVISES	
SUPPORT	HOLD UP	
SUPPORTED	HELD UP	
SUPPORTING	HOLDING UP	
SUPPORTS	HOLDS UP	
TABULATE	MAKE A TABLE	LIST
TABULATED	MADE A TABLE	LISTED
TABULATES	MAKES A TABLE	LISTS
TABULATING	MAKING A TABLE	LISTENING
THREW	SET SWITCH TO	
THROW	SET SWITCH TO	
THROWING	SETTING SWITCH TO	
THROWN	SET SWITCH TO	
THROWS	SETS SWITCH TO	
TRANSFER	MOVE	
TRANSFERRED	MOVED	
TRANSFERRING	MOVING	
TRANSFERS	MOVES	
TRANSPORT	MOVE	
TRANSPORTED	MOVED	
TRANSPORTING	MOVING	
TRANSPORTS	MOVES	
UNCAP	REMOVE CAP	
UNCAPPED	REMOVED CAP	
UNCAPPING	REMOVING CAP	
UNCAPS	REMOVES CAP	
UNPLUG	REMOVE PLUG	
UNPLUGGED	REMOVED PLUG	
UNPLUGGING	REMOVING PLUG	
UNPLUGS	REMOVES PLUG	
UNSCREW	REMOVE SCREW	
UNSCREWED	REMOVED SCREW	

Word to be  
Substituted

First  
Substitute

UNSCREWING	REMOVING SCREW
UNSCREWS	REMOVES SCREW
UTILIZE	USE
UTILIZED	USED
UTILIZES	USES
UTILIZING	USING
VERIFIED	WAS/WERE SURE
VERIFIES	IS SURE
VERIFY	BE SURE
VERIFYING	BEING SURE
WITHDRAW	PULL OUT
WITHDRAWING	PULLING OUT
WITHDRAWN	PULLED OUT
WITHDRAWS	PULLS OUT
WITHDREW	PULLED OUT

APPENDIX F

THE TEST PASSAGES

These test passages were used to evaluate the performance of the features of the Computer Readability Editing System. Complete references on the sources of the passages are contained at the end of the appendix. The heading of each passage gives the manual number and paragraph number of that passage. The passages are presented in two main groups: (1) the NAVSEA passages and (2) the instructional and procedural passages. The third group, the FORCAST and Kincaid passages, have been published elsewhere. The FORCAST passages are available in Caylor, Sticht, Fox, and Ford (1973) and the Kincaid passages in Kincaid, Fishburne, Rogers, and Chissom (1975).

## TEST PASSAGES FROM THE NAVSEA MANUAL

NAVSEA S9086-BH-STM-00/CH 041. PARAGRAPHS 041-1.1 THROUGH 041-1.4

SECTION 1 GENERAL 041-1.1 GENERAL 041-1.2 THIS SECTION CONTAINS THE BASIC REGULATIONS AND REFERENCES TO REGULATIONS PERTAINING TO THE ADMINISTRATION OF FUNDS APPROPRIATED FOR PROGRAMS ASSIGNED TO THE NAVAL SEA SYSTEMS COMMAND (NAVSEA). 041-1.3 SOURCES OF AUTHORITY 041-1.4 IN ORDER TO CONDUCT THE FUNCTIONS WITH WHICH NAVSEA IS CHARGED IN NAVY REGULATIONS AND OTHER SECRETARY OF THE NAVY (SECNAV) INSTRUCTIONS, REQUESTS FOR FUNDS ARE MADE ANNUALLY VIA VARIOUS LEVELS OF EXECUTIVE REVIEW TO THE CONGRESS. RESULTANT FUNDS APPROPRIATED BY THE CONGRESS ARE MADE AVAILABLE TO THE COMMANDER, NAVSEA THROUGH THE APPORTIONMENT PROCEDURES OF THE EXECUTIVE BRANCH VIA SECRETARY OF DEFENSE (COMPTROLLER) AND SECRETARY OF THE NAVY. TITLE IV OF THE NATIONAL SECURITY ACT OF 1947, AS AMENDED, PRESCRIBES HOW DEPARTMENT OF DEFENSE BUDGET ESTIMATES SHALL BE PREPARED, PRESENTED, AND JUSTIFIED; ESTABLISHES THE FUNCTIONS OF THE DEPARTMENTAL COMPTROLLER ORGANIZATION; AND PRESCRIBES THE USES OF WORKING CAPITAL FUNDS. SECTION 3679 OF THE REVISED STATUTES, AS AMENDED, PROVIDES THAT ALL AGENCIES OF THE GOVERNMENT RECEIVING APPROPRIATIONS OF PUBLIC FUNDS WILL ESTABLISH ADMINISTRATIVE REGULATIONS TO PREVENT OVER-EXPENDITURE OR OVER-OBLIGATION OF FUNDS AND WILL REQUIRE MAINTENANCE OF ACCOUNTING RECORDS TO PROVIDE FULL DISCLOSURE OF FINANCIAL OPERATIONS. IMPLEMENTING THESE LAWS, THE SECRETARY OF DEFENSE (COMPTROLLER) AND THE SECRETARY OF THE NAVY (COMPTROLLER) HAVE ISSUED ADMINISTRATIVE REGULATIONS, APPLICABLE TO THE FINANCIAL OPERATIONS OF THE COMMANDS, WHICH ARE EMBODIED IN DOD, SECNAV, AND NAVCOMPT DIRECTIVES AND INSTRUCTIONS, AND NAVCOMPT AND NAVAL SUPPLY SYSTEMS COMMAND MANUALS. ADDITIONAL INSTRUCTIONS APPLICABLE TO FUNDS OF NAVSEA ARE PROMULGATED BY AMENDMENTS TO THE NAVCOMPT AND NAVAL SUPPLY SYSTEMS COMMAND MANUALS, AND BY NAVSEA NOTICES AND INSTRUCTIONS. IT IS INTENDED THAT THIS CHAPTER SERVE AS A GENERAL FINANCIAL GUIDE IN PROGRAMS ADMINISTERED BY NAVSEA WITH SPECIFIC INSTRUCTIONS AND REGULATIONS BEING PROVIDED IN THE AFOREMENTIONED SOURCES. SECTION 2

RESPONSIBILITIES 041-2.1 NAVSEA RESPONSIBILITY 041-2.2 THE COMMANDER, NAVAL SEA SYSTEMS COMMAND, IS RESPONSIBLE TO THE SECRETARY OF THE NAVY (COMPTROLLER) FOR THE PREPARATION OF APPROPRIATION BUDGETS FOR PROGRAMS WITHIN HIS TECHNICAL COGNIZANCE AND FOR THE ADMINISTRATION OF APPROPRIATED FUNDS RECEIVED FROM THE OFFICE OF MANAGEMENT AND BUDGET INCLUDING ESTIMATED REIMBURSEMENTS, TRANSFERS, AND ALL OTHER ITEMS OF ANTICIPATED RECEIPTS. HE HAS AUTHORITY WITHIN THE STATUTORY LANGUAGE OF THE APPROPRIATIONS AND THE APPORTIONMENT SCHEDULE TO EMPLOY ALLOCATED FUNDS AS HE MAY DEEM PROPER IN THE EXECUTION OF THE PROGRAMS. HE IS ALSO RESPONSIBLE FOR THE ESTABLISHMENT OF ADEQUATE FUNDS CONTROL RECORDS, AND FOR ENSURING THAT THE OFFICIAL ACCOUNTING RECORDS MAINTAINED BY THE NAVAL MATERIAL COMMAND SUPPORT ACTIVITY PROVIDE FULL DISCLOSURE OF THE FINANCIAL OPERATIONS AND RESOURCES DERIVED FROM APPROPRIATIONS AND FUNDS ASSIGNED TO NAVSEA FOR ADMINISTRATIVE CONTROL. HE HAS POWER TO DELEGATE THIS AUTHORITY, AND HAS DONE SO, WITH FURTHER REDELEGATION AUTHORIZED, TO HIS COMPTROLLER WHOSE FUNCTIONS ARE CONTAINED IN PARAGRAPH 041-2.7. 041-2.3 CONCURRE WITH THE RESPONSIBILITY FOR ADMINISTRATION OF FUNDS IS THE RESPONSIBILITY FOR DETERMINING PROGRESS ACHIEVED IN THE ACCOMPLISHMENT OF AUTHORIZED PROGRAMS. THE ACCURATE AND TIMELY PREPARATION OF STATISTICAL AND FINANCIAL DATA COMPILED FOR MANAGEMENT OF NAVSEA PROGRAMS IS ALSO PART OF THE FINANCIAL STEWARDSHIP VESTED IN THE COMMANDER AND DELEGATED BY HIM TO HIS PRIMARY OFFICERS COGNIZANT OF VARIOUS PARTS OF ASSIGNED PROGRAMS. 041-2.4 GENERAL CONCEPT OF THE COMPTROLLER FUNCTION 041-2.5 THE

SECRETARY OF THE NAVY HAS PROMULGATED THE FOLLOWING EXPLANATION OF THE COMPTROLLER FUNCTION FOR GUIDANCE: THE COMPTROLLER MUST PROVIDE TECHNICAL GUIDANCE AND DIRECTION TO THE CONDUCT OF SPECIFIC FACT COLLECTION SYSTEMS IN THE AREAS OF BUDGET FORMULATION AND EXECUTION, PROGRAM ANALYSIS, ACCOUNTING, PROGRESS REPORTS, AND STATISTICS. THE FULLY COORDINATED STAFF SERVICE PROVIDED BY THE COMPTROLLER SHOULD RELIEVE THE COMMANDING OFFICER OF MUCH OF THE BURDEN OF DETAILED FACT COLLECTION, COORDINATION, AND ANALYSIS. WHEN PROPERLY PERFORMED, COMPTROLLERSHIP WILL ENABLE THE COMMANDING OFFICER TO SPEND MORE OF HIS TIME IN THE AREAS OF POLICY FORMULATION, DECISION, AND PROGRAM DIRECTION. 041-2.6NAVSEA COMPTROLLER RESPONSIBILITY 041-2.7THE COMPTROLLER IS THE OFFICER IN CHARGE OF THE PLANS, PROGRAMS, AND FINANCIAL MANAGEMENT OR COMPTROLLER DIRECTORATE WHICH IS COMPRISED OF FIVE APPROPRIATION DIVISIONS, THREE ACCOUNTING DIVISIONS, AS WELL AS SUPPORTING STAFF OFFICES. THESE DIVISIONS PERFORM FISCAL STAFF FUNCTIONS FOR ALL DIVISIONS OF NAVSEA ENGAGED IN EXECUTION OF THE GENERAL FINANCIAL PLAN FOR EACH FUNDED PROGRAM. THE AUTHORITY OF THE COMMANDER, NAVSEA FOR THE ADMINISTRATIVE CONTROL OF APPROPRIATIONS AND FUNDS ALLOCATED OR OTHERWISE MADE AVAILABLE TO NAVSEA HAS BEEN DELEGATED TO THE COMPTROLLER. SUBJECT TO THE DIRECTION AND CONTROL OF THE COMMANDER, NAVSEA, THE COMPTROLLER WILL PERFORM THE FOLLOWING FUNCTIONS: PREPARE AND SIGN ALL COMMAND REQUESTS FOR BUDGET ACTIVITY ALLOCATIONS, APPORTIONMENTS, AND REAPPORTIONMENT ESTABLISH AND DEFINE PROJECTS AND SUBPROJECTS IN APPROVED COMMAND PROGRAMS, MAKE INTERNAL ALLOCATIONS TO SUCH PROJECTS AND SUBPROJECTS WITHIN THE APPORTIONMENTS OR REAPPORTIONMENT AND BUDGET ACTIVITY ALLOCATIONS APPROVED BY AUTHORITY. APPROVE OR DISAPPROVE, ON THE BASIS OF THE APPROVED FINANCIAL PLAN, ALL REQUESTS FOR THE ISSUANCE OF DOCUMENTS COMMITTING, OBLIGATING, OR AUTHORIZING THE EXPENDITURE OF FUNDS, REQUIRE ACCOUNTING RECORDS TO BE MAINTAINED, ESTABLISH, OR REQUIRE TO BE ESTABLISHED, FISCAL CONTROLS WHICH WILL PREVENT OVERCOMMITMENT, OVEROBLIGATION, OR OVER-EXPENDITURE OF FUNDS, APPORTIONMENTS, REAPPORTIONMENT OR SUBDIVISIONS THEREOF. THE COMPTROLLER IS ALSO AUTHORIZED TO PERFORM AUDITS IN NAVSEA, FIELD ACTIVITIES, AND COMMANDS WHERE NAVSEA HAS BEEN ASSIGNED COMMAND. 041-2.8DELEGATE FIELD RESPONSIBILITY 041-2.9EACH COMMAND OR ACTIVITY AUTHORIZED BY NAVSEA TO OBLIGATE OR EXPEND APPROPRIATED FUNDS WILL ADMINISTER AND ACCOUNT FOR SUCH FUNDS IN COMPLIANCE WITH APPLICABLE FEDERAL LAW, APPLICABLE DEPARTMENT OF DEFENSE REGULATIONS AND NAVCOMPT INSTRUCTIONS, AND SUCH SUPPLEMENTARY NAVSEA INSTRUCTIONS AS MAY BE ISSUED

TEST PASSAGES FROM THE NAVSEA MANUAL

NAVSEA S9086-BH-STM-00/CH 079. PARAGRAPHS 079-20.1 THROUGH 079-21.6

ON THE MORE DETAILED PHASES OF SPECIFIC PROGRAMS.

CHAPTER 079 DAMAGE CONTROL VOLUME 2 PRACTICAL DAMAGE CONTROL SECTION 20  
GENERAL 079-20.1 BASIC DAMAGE CONTROL CONSIDERATIONS 079-20.2 THE MOST  
IMPORTANT PHASE OF DAMAGE CONTROL IS THAT WHICH TAKES PLACE BEFORE DAMAGE  
HAPPENS. ONLY THROUGH TRAINING, EXERCISES, TESTS, AND INSPECTIONS CAN  
PERSONNEL OF THE SHIP OBTAIN THE CAPABILITY AND KNOWLEDGE OF HOW TO ACT WHEN  
ACTION IS NEEDED. 079-20.3 IT IS TOO  
LATE TO START AN INTENSIVE DAMAGE CONTROL OR FIREFIGHTING PROGRAM WHEN THE  
SHIP IS SINKING OR INVOLVED WITH A CONFLAGRATION. TRAINING MUST START WHEN  
THE SHIP IS IN CHARGE OF A PRECOMMISSIONING DETAIL AND MUST NEVER CEASE  
UNTIL THE SHIP IS STRICKEN FROM THE NAVY LIST. 079-20.4 THE INFORMATION IN  
THIS VOLUME IS NOT INTENDED TO SUPERSEDE, MAKE OBSOLETE, OR INVALIDATE ANY  
DIRECTIVE OR PUBLICATION PERTAINING TO TYPE, CLASS, OR PARTICULAR SHIP  
ISSUED BY COMPETENT AUTHORITY. 079-20.5 ANY REFERENCE TO THE DAMAGE CONTROL  
OFFICER SHALL BE INTERPRETED TO MEAN THAT OFFICER IN THE CHAIN OF COMMAND,  
WHO IS AUTHORIZED AND ASSIGNED THE RESPONSIBILITY FOR THE DAMAGE CONTROL  
ORGANIZATION IN ALL MATTERS, INCLUDING MAKING DECISIONS AND TAKING ACTION.  
079-20.6 OBJECTIVES. THE THREE BASIC OBJECTIVES OF SHIPBOARD DAMAGE CONTROL  
ARE: TO TAKE ALL PRACTICABLE PRELIMINARY ACTION, BEFORE DAMAGE OCCURS, SUCH  
AS MAINTENANCE OF WATERTIGHT AND AIRTIGHT INTEGRITY, PRESERVATION OF RESERVE  
BUOYANCY AND STABILITY, REMOVAL OF FIRE HAZARDS, AND UPKEEP AND DISTRIBUTION  
OF EMERGENCY EQUIPMENT. TO MINIMIZE AND LOCALIZE SUCH DAMAGE AS DOES OCCUR,  
BY SUCH ACTIONS AS CONTROL OF FLOODING, PRESERVATION OF STABILITY AND  
BUOYANCY, COMBATING FIRE, AND FIRST-AID TREATMENT OF PERSONNEL. TO  
ACCOMPLISH EMERGENCY REPAIRS OR RESTORATIONS AS QUICKLY AS POSSIBLE AFTER  
THE OCCURRENCE OF DAMAGE. BY SUCH ACTIONS AS SUPPLYING CASUALTY POWER,  
REGAINING A SAFE MARGIN OF STABILITY AND BUOYANCY, REINFORCING DAMAGED  
STRUCTURES, AND MANNING ESSENTIAL EQUIPMENT. 079-20.7 THE SHIP'S ABILITY TO  
INFLECT PUNISHMENT UPON AND DESTROY AN ENEMY OR TO PERFORM ANY OTHER  
ASSIGNED MISSION MAY DEPEND

UPON THE EFFECTIVENESS OF DAMAGE CONTROL PROCEDURES. IT IS ESSENTIAL THAT  
EVERY MEMBER OF THE SHIP'S COMPANY RECOGNIZE HIS RESPONSIBILITY AND ITS  
IMPORTANCE. 079-20.8 DAMAGE CONTROL MUST BE CONSIDERED AS AN OFFENSIVE, AS  
WELL AS A DEFENSIVE FUNCTION. 079-20.9 SCOPE. DAMAGE CONTROL IS CONCERNED  
NOT ONLY WITH BATTLE DAMAGE BUT ALSO WITH NONBATTLE DAMAGE SUCH AS FIRE,  
COLLISION, GROUNDING, OR EXPLOSION. IT MAY BE NECESSARY IN PORT AS WELL AS  
AT SEA, AND MAY INVOLVE THE USE OF PERSONNEL AND FACILITIES OF AN UNDAMAGED  
SHIP. 079-20.10 NECESSARY KNOWLEDGE 079-20.11 DAMAGE CONTROL REQUIRES A  
DETAILED KNOWLEDGE OF SHIP CONSTRUCTION, CHARACTERISTICS COMPARTMENTATIO  
STABILITY, AND OF THOSE APPURTENANCES PLACED IN A SHIP TO PREVENT OR CONTROL  
DAMAGE SHOULD THE SHIP BE ENDANGERED. 079-20.12 THE CONTROL OF DAMAGE  
DEPENDS UPON THE ABILITY AND INITIATIVE OF PERSONNEL TO TAKE PROMPT  
CORRECTIVE ACTION, USING THE MATERIAL WHICH IS READILY AVAILABLE. HAVING A  
THOROUGH KNOWLEDGE OF THE SHIP WILL ENABLE PERSONNEL TO DETERMINE READILY  
THE CORRECTIVE ACTION TO BE TAKEN. 079-20.13 THIS VOLUME PRESENTS, OR  
INCORPORATES BY REFERENCE TO OTHER NAVAL SHIPS TECHNICAL MANUAL (NSTM)  
CHAPTERS, INFORMATION CONCERNING THOSE FEATURES OF DAMAGE CONTROL AS A  
RESPONSIBILITY OF THE NAVAL SEA SYSTEMS COMMAND (NAVSEA) WHICH ARE OF  
GENERAL APPLICATION, BULLETINS, INDIVIDUAL SHIPS DAMAGE CONTROL BOOKS, AND  
EQUIPMENT INSTRUCTION PAMPHLETS CONTAIN ADDITIONAL OR MORE SPECIFIC

MATERIAL, DOCTRINES AND INSTRUCTIONS CONCERNING ORGANIZATION AND TRAINING ARE PROMULGATED BY THE CHIEF OF NAVAL OPERATIONS (CNO), THE CHIEF OF NAVAL PERSONNEL, AND ABOARD COMMANDERS. 079-20.14 DAMAGE CONTROL BOOKS SURFACE SHIPS. DAMAGE CONTROL BOOKS ISSUED BY NAVSEA CONTAIN INFORMATION IN THE FORM OF TEXT, TABLES, AND DIAGRAMS CONCERNING DAMAGE CONTROL FACILITIES AND CHARACTERISTICS COMPARTMENTATION PIPING, AND WIRING SYSTEMS. THE BOOKS ARE SUPPLIED TO FLEET COMMANDERS, FORCE COMMANDERS, DIVISION COMMANDERS, SQUADRON COMMANDERS, AND COMMANDING OFFICERS OF SHIPS AND OTHER NAVAL ACTIVITIES. IN ACCORDANCE WITH THEIR REQUIREMENTS, A RECORD OF ALL BOOKS DISTRIBUTED IS MAINTAINED BY NAVSEA; THEY SHALL NOT BE TRANSFERRED WITH OUT NAVSEA AUTHORITY. RECIPIENTS ARE CONSIDERED RESPONSIBLE FOR BOOKS TO THE SAME EXTENT AS FOR SHIPS PLANS AND SPECIFICATIONS. CUSTODIANS OF THE BOOKS, UPON DETACHMENT, SHALL INSURE THAT ALL BOOKS ARE ACCOUNTED FOR AND TURNED OVER TO THEIR SUCCESSORS. WHEN THE STATUS OF A SHIP IS CHANGED FROM ACTIVE TO RESERVE, THE OVERHAULING ACTIVITY WILL REVISE THE MASTER COPY AND FORWARD IT TO NAVSEA. 079-20.15 DAMAGE CONTROL BOOKS ARE SUPPLIED TO SHIPS IN THE RESERVE FLEET. RESERVE FLEET COMMANDERS SHALL TAKE ACTION TO ASCERTAIN THAT THE LATEST DAMAGE CONTROL BOOKS ARE MADE AVAILABLE TO THE OVERHAULING ACTIVITY PRIOR TO AN AVAILABILITY. 079-20.16 WHEN A SHIP IS DECOMMISSIONED AND SCHEDULED FOR DISPOSAL OR SCRAPPING, THE DAMAGE CONTROL BOOKS (TEXT AND DIAGRAMS) SHALL BE BURNED AND THEIR DISPOSITION REPORTED TO NAVSEA. 079-20.17 DAMAGE CONTROL BOOKS ARE SUPPLIED TO ALL COMBATANT, MISCELLANEOUS, AND AUXILIARY SHIPS OVER 220 FEET IN LENGTH (INCLUDING FLOATING DRYDOCKS), AND TO CERTAIN SMALL FLEET-OPERATED SHIPS UNDER 220 FEET IN LENGTH, SUCH AS MINE WARFARE SHIPS. 079-20.18 FOR OTHER SHIPS, DAMAGE CONTROL BOOKS MAY BE INDEPENDENTLY DEVELOPED BY THE SHIP. 079-20.19 REQUESTS FOR DAMAGE CONTROL BOOKS SHALL BE IN ACCORDANCE WITH CHAPTER 080 (9001), PUBLICATIONS AND DRAWINGS. 079-20.20 DAMAGE CONTROL DIAGRAMS. DAMAGE CONTROL DIAGRAMS ARE THREE-DIMENSION ISOMETRIC DIAGRAMS. THEY ARE DEVELOPED AND PROVIDED UNDER RIGID REQUIREMENTS ESTABLISHED BY NAVSEA AND ARE SUPPLIED TO SHIPS. ON ALL DIAGRAMS, EACH COMPARTMENT, TANK, VOID OR OTHER AREA WILL BE DESIGNATED BY NUMBER, LETTER, OR COMBINATION THEREOF. THE VARIOUS SYSTEMS SUCH AS PIPING AND COMMUNICATIONS ARE REPRESENTED AS NEAR TO ACTUAL INSTALLATIONS AS PRACTICABLE AND ARE DESIGNATED BY COLORS, LETTERING, AND NUMERALS, AS WELL AS SYMBOLS. 079-20.21 FIGURE 079-100 ILLUSTRATES SOME OF THE SYMBOLS USED IN DAMAGE CONTROL DIAGRAMS. FIGURE 079-100. DAMAGE CONTROL DIAGRAM SYMBOLS 079-20.22 EACH DECK OR PLATFORM IS SHOWN AS A SEPARATE LEVEL. COMPARTMENTS NOT INTERSECTED BY DECKS OR PLATFORMS ARE DRAWN AS PART OF THE DECK FROM WHICH THEY EXTEND. HEAVY LINES ARE USED TO INDICATE WATERTIGHT AND OILTIGHT BOUNDARIES; LIGHTER LINES INDICATE AIRTIGHT, FUMETIGHT, AND NON-TIGHT BOUNDARIES. DOTTED LINES AND CROSSHATCHING ARE USED TO INDICATE HIDDEN BOUNDARIES, PIPING, AND VALVES. THE VISIBLE PIPING IS REPRESENTED BY SOLID LINES. PIPING WHICH PIERCES A BULKHEAD HAS A CIRCLE SHOWING THE POINT OF PENETRATION. THERE IS NO CIRCLING AT THE POINT OF DECK PENETRATION. 079-20.23 FIGURE 079-101 (TWO SHEETS) IS A TYPICAL DAMAGE CONTROL DIAGRAM SHOWING THE UTILIZATION OF THE DIAGRAM SYMBOLS. FIGURE 079-101. TYPICAL DAMAGE CONTROL DIAGRAM (SHEET 1 OF 2) FIGURE 079-101. TYPICAL DAMAGE CONTROL DIAGRAM (SHEET 2 OF 2) 079-20.24 DIAGRAMS MEASURING 38 BY 53 INCHES ARE SUPPLIED TO AIRCRAFT CARRIERS, HEAVY CRUISERS, AND MISCELLANEOUS LARGE SHIPS, EXCEPT: VITAL DAMAGE CONTROL ELECTRICAL EQUIPMENT AND POWER SUPPLY CHARTS ARE 38 BY 26 INCHES. COMMUNICATION DIRECTORIES ARE 48 BY 26 INCHES. LIQUID LOADING DIAGRAMS ARE EITHER 10 X 26 INCHES OR 10 BY 53 INCHES. 079-20.25 DIAGRAMS ARE SUPPLIED TO OTHER SHIPS IN THE FOLLOWING SIZES: GUIDED MISSILE CRUISERS AND COMPARABLE SIZE SHIPS LARGER THAN DESTROYERS AND SMALLER THAN HEAVY CRUISERS ARE 25 X 38 INCHES. DESTROYERS AND OTHER TYPES OF COMPARABLE SIZE ARE 16 BY 28 INCHES. MISCELLANEOUS VARIATIONS OF THE FOREGOING SIZES AS APPROVED BY NAVSEA. 079-20.26 SHIPS

REVISION RESPONSIBILITY. DAMAGE CONTROL BOOKS ARE AS NEARLY CORRECT AS POSSIBLE: HOWEVER, ERRORS ARE INEVITABLE. ACCURACY OF THE INFORMATION WILL BE REDUCED AS ALTERATIONS TO THE SHIP ARE MADE. EFFORTS SHOULD BE MADE TO MAINTAIN THE BOOKS TO REFLECT THE MOST RECENT INSTALLATIONS. 079-20.27 THE MASTER COPY CONSISTING OF DIAGRAMS AND TEXT SHALL BE KEPT CURRENT AT ALL TIMES. AND REVISIONS SHOULD BE CLEARLY MARKED SO THAT OTHER COPIES MAY BE REVISED FROM IT. ALL COPIES OF DAMAGE CONTROL BOOKS SHALL BE REVISED TO REFLECT ALTERATIONS MADE BY THE SHIPS FORCE OR ACTIVITIES OTHER THAN THE OVERHAUL

ACTIVITY. ALTERATIONS ARE TO BE ENTERED ON THE MASTER COPY AS SOON AS THEY ARE COMPLETED. 079-20.28 WHEN NAVSEA FURNISHES DIAGRAMS AND TEXT FOR A CLASS, I.E., A GROUP OF SHIPS, THE SHIPS FORCE SHALL CHECK AND REVISE THIS MATERIAL TO REFLECT THE ACTUAL INSTALLATION IN THE INDIVIDUAL SHIP. AT THE TIME OF EACH OVERHAUL, OR WHEN ALTERATIONS ARE MADE BY AN OVERHAUL ACTIVITY, THE COMMANDING OFFICER SHALL DELIVER THE MASTER AND ONE DUPLICATE COPY TO THE ACTIVITY. THESE COPIES SHALL BE HAND-CORRECTED OR RELITHOGRAPHED FOR THE PRECEDING OVERHAUL, AND THE ACTIVITY SHALL BE REQUESTED TO HAVE THE VOLUMES REVISED. REVISIONS WILL INCLUDE ALTERATIONS MADE BY THE ACTIVITY IN ADDITION TO ALL THE WORK ACCOMPLISHED BY THE SHIPS FORCE, AS SHOWN ON THE MASTER COPY. THE COMMANDING OFFICER SHALL ASCERTAIN THAT T

HE MASTER COPY HAS BEEN REVISED AND ACCURATELY REPRESENTS THE SHIP AT THE TIME OF ITS DEPARTURE FROM THE SHIP YARD. THE REVISIONS SHALL BE INCLUDED IN THE CURRENT SHIPS MAINTENANCE PROJECT (CSMP). IT SHALL BE STATED THEREIN WHETHER THE SHIPS FORCE REQUIRES ASSISTANCE FROM THE SHIPYARD IN CHECKING THE DAMAGE CONTROL DIAGRAMS AND/OR TEXT. 079-20.29 REVISIONS TO THE SHIPS MASTER COPY, BY SHIPS FORCE, SHALL BE MADE AS FOLLOWS: DELETIONS ON THE DIAGRAMS ARE TO BE INDICATED BY CROSSING OUT THE DELETED MATTER WITH RED INK. NO ERASURES SHALL BE MADE, NOR IS IT NECESSARY TO MAKE ANY NOTES ON THE DIAGRAMS TO INDICATE THAT THE MATTER IS TO BE DELETED. ADDITIONS TO THE DIAGRAM SHALL BE MADE IN ACCORDANCE WITH THE ESTABLISHED COLOR CODING SYSTEMS. INDICATE ADDITIONS IN THEIR CORRECT POSITIONS. EACH CHANGE OR ADDITION IS TO BE EMPHASIZED BY CIRCLING THE AREAS AFFECTED WITH RED INK. CHANGES IN THE NAMES OF COMPARTMENTS OR IN NOTES ON THE DIAGRAMS MAY BE MADE BY A MARGINAL NOTE. MINOR CHANGES, SUCH AS FROM NONTIGHT DUCT TO WATERTIGHT AND VICE VERSA, OR IN THE TYPE OF VALVE, CAN BE INDICATED BY A MARGINAL NOTE WITH A MARK TO INDICATE THE EXTENT OF THE CORRECTION. REVISIONS TO TEXT SHALL BE MADE IN RED INK. 079-20.30 OVERHAULING ACTIVITY'S REVISION RESPONSIBILITY. WHEN DIAGRAMS ARE PROCESSED IN COLOR, THE ACTIVITY SHALL REVISE THEM AS FOLLOWS:

THE SHIPS MASTER COPY AND THE DUPLICATE COPY SHALL BE REVISED TO SUIT ALL CHANGES MADE DURING AN OVERHAUL. IN ACCORDANCE WITH MIL-STD-784, THE REVISIONS MUST BE COMPLETED PRIOR TO THE SHIPS DEPARTURE FROM THE SHIPYARD. IF IT IS IMPOSSIBLE TO MEET THE SAILING DATE, THE OVERHAULING ACTIVITY SHALL INFORM NAVSEA IMMEDIATELY, AND INDICATE THE EARLIEST COMPLETION DATE AFTER DEPARTURE. THE OVERHAUL OF T

HE SHIP WILL NOT BE CONSIDERED COMPLETED UNTIL THE REVISIONS ARE MADE. DAMAGE CONTROL DIAGRAMS AND RELATED TEXT SHALL BE CHECKED AGAINST THE ACTUAL INSTALLATION IN THE SHIP, ONLY IF REQUIRED BY THE COMMANDING OFFICER. CHECKING SHALL NOT NECESSITATE THE REMOVAL OF BULKHEADS OR WIREWAYS.

079-20.31 THE DUPLICATE COPY OF THE REVISED SHIPS MASTER COPY DIAGRAMS AND TEXT SHALL BE RETURNED TO THE SHIP BEFORE DEPARTURE. THE LETTER FROM THE OVERHAULING ACTIVITY, FORWARDING THE DUPLICATE COPY TO THE SHIP, SHALL STATE THAT THE MATERIAL IS FOR INTERIM USE ONLY AND THAT THE EXISTING MATERIAL IN THE SHIP SHOULD NOT BE DESTROYED PENDING RECEIPT OF REPRINTED MATERIAL FROM NAVSEA. WHEN THE REPRINTED MATERIAL IS ISSUED, OBSOLETE COPIES SHALL BE DESTROYED BY BURNING. 079-20.32 WHEN THE SHIPS DAMAGE CONTROL DIAGRAMS ARE REPRODUCED IN HALFTONE, THE ACTIVITY SHALL REVISE THEM AS FOLLOWS: THE SHIPS MASTER COPY HALFTONE ILLUSTRATIONS AND RELATED TEXT SHALL BE REVISED TO SUIT ALL CHANGES MADE DURING AN OVERHAUL, INCLUDING ANY CHANGES MADE BY THE SHIPS FORCE. IN ACCORDANCE WITH MIL-STD-784, REVISIONS MUST BE COMPLETED PRIOR TO

SHIPS DEPARTURE. THE NEW COPIES OF THE DAMAGE CONTROL DIAGRAMS AND REVISED TEXT SHALL BE DELIVERED TO THE SHIP PRIOR TO DEPARTURE. TOGETHER WITH THE MASTER COPY BINDER, THREE SETS SHALL BE PROVIDED FOR SHIPS UNDER 220 FEET IN LENGTH AND FIVE SETS SHALL BE SUPPLIED FOR SHIPS OVER 220 FEET IN LENGTH. 079-20.33 DAMAGE CONTROL BOOKS SUBMARINES. DAMAGE CONTROL BOOKS PREPARED FOR SUBMARINES CONTAIN TEXT, TABLES, PLATES, AND DRAWINGS. THE TEXT DISCUSSES DAMAGE CONTROL AND ASSOCIATED PROBLEMS PECULIAR TO SUBMARINES. THE TABLES PRESENT FACTUAL DATA, AND THE PLATES AND DRAWINGS SUPPORT THE TEXT. THE PLATES ARE PREPARED IN BLACK AND WHITE. ONE COPY OF THE DAMAGE CONTROL BOOK SHALL BE

MARKED SHIPS MASTER COPY AND SHALL BE KEPT CURRENT AS REQUIRED FOR SURFACE SHIPS. SEE PARAGRAPHS 079-20.26 THROUGH 079-20.32. THE OVERHAULING ACTIVITY SHALL REVISE THE DAMAGE CONTROL BOOK TO REFLECT ALL CHANGES MADE DURING OVERHAUL, INCLUDING ANY CHANGES MADE BY SHIPS FORCE, AND REPRODUCE AND DISTRIBUTE IT IN ACCORDANCE WITH MIL-STD-797. 079-20.34 REPORTING REQUIREMENTS. SUPERVISORS OF SHIPBUILDING AND COMMANDERS OF NAVAL SHIPYARDS SHOULD SUBMIT QUARTERLY REPORT NAVSEA 9664-1 ON NAVSEA FORM 9664/1 (FORMERLY NAVSEC 9880/1), STATUS OF DAMAGE CONTROL BOOK, TO THE COMMANDER, NAVAL SHIP ENGINEERING CENTER (NAVSEC), WITH COPIES TO NAVSEA, INDICATING ACTUAL AND ESTIMATED COMPLETION DATES FOR ALL DAMAGE CONTROL BOOK PROJECTS. NAVSEC FORM 9880/1 SHALL BE USED UNTIL THE SUPPLY OF THAT FORM IS DEPLETED. 079-20.35 MANUFACTURERS INSTRUCTION BOOKS. THIS VOLUME CONTAINS GENERAL INSTRUCTIONS FOR THE OPERATION, MAINTENANCE, AND REPAIR OF DAMAGE CONTROL AND FIREFIGHTING EQUIPMENT. ALL CONDITIONS CANNOT BE COVERED BECAUSE OF THE GREAT NUMBER OF MAKES, TYPES, AND DESIGNS OF EQUIPMENT ENCOUNTERED IN NAVAL SERVICE. FOR ALL BUT THE MOST SIMPLE TYPES OF EQUIPMENT, MANUFACTURERS INSTRUCTION BOOKS ARE SUPPLIED. THEY CONTAIN DETAILED INFORMATION CONCERNING THE OPERATION, MAINTENANCE, AND REPAIR OF THE SPECIFIC PIECE OF EQUIPMENT AND SHOULD BE STUDIED CAREFULLY BEFORE THE UNIT IS OPERATED OR SERVICED. SHOULD ANY CONFLICT EXIST BETWEEN THE INSTRUCTIONS GIVEN IN THIS VOLUME AND THE MANUFACTURERS INSTRUCTIONS, NAVSEA SHALL BE CONSULTED. 079-20.36 OTHER DAMAGE CONTROL REFERENCES. TABLE 079-3 LISTS PUBLICATIONS WHICH CONTAIN INFORMATION AND INSTRUCTIONS NECESSARY FOR KNOWLEDGE OF DAMAGE CONTROL PRACTICES AND PROCEDURES. TABLE 079-3. DAMAGE CONTROL REFERENCE PUBLICATIONS SECTION 21 THE SHIP AND DAMAGE CONTROL 079-21.1 DAMAGE CONTROL ORGANIZATION 079-21.2 THE PRIMARY DAMAGE CONTROL BATTLE ORGANIZATION UNIT IS THE REPAIR PARTY. CERTAIN REPAIR PARTIES MAY BE SUBDIVIDED, OR CERTAIN FUNCTIONS MAY BE

THE JOINT RESPONSIBI

LITY OF TWO OR MORE REPAIR PARTIES. 079-21.3 INASMUCH AS THE ASSIGNMENT AND ORGANIZATION OF SHIP PERSONNEL TO DAMAGE CONTROL FUNCTIONS IS NOT A FUNCTION OF NAVSEA, IT IS SUGGESTED THAT CURRENT DIRECTIVES ISSUED BY PROPER AUTHORITY BE CONSULTED WHEN ORGANIZING OR REORGANIZING SHIP DAMAGE CONTROL PERSONNEL. THE DAMAGE CONTROL ORGANIZATION IN A SHIP SHALL CONFORM WITH THE RECOMMENDATIONS CONTAINED IN NWIP 50-3 AND SUCH OTHER DIRECTIVES ISSUED BY PROPER AUTHORITY. 079-21.4 IN CARRYING OUT THE PROVISIONS OF IMPLEMENTING DIRECTIVES, THE COMMANDING OFFICER, THROUGH THE EXECUTIVE OFFICER AND THE DAMAGE CONTROL ORGANIZATION, SHOULD IMPRESS UPON ALL PERSONNEL UNDER HIS COMMAND THE NECESSITY FOR OBTAINING THE HIGHEST DEGREE OF EFFICIENCY IN THE CONTROL OF DAMAGE THROUGH THOROUGH UNDERSTANDING AND APPLICATION OF DAMAGE CONTROL PRINCIPLES. 079-21.5 RESPONSIBILITY OF DAMAGE CONTROL OFFICER. RESPONSIBILITY OF THE DAMAGE CONTROL OFFICER INCLUDES THE EFFICIENT FUNCTIONING OF THE DAMAGE CONTROL ORGANIZATION. WATERTIGHT INTEGRITY, FIRE PREVENTION, MAINTENANCE OF CONDITION OF CLOSURE, AND DAMAGE CONTROL EQUIPMENT. 079-21.6 THE DAMAGE CONTROL OFFICER ALSO SHOULD INSURE THAT ALL DAMAGE CONTROL PERSONNEL RECEIVE TRAINING AND QUALIFY IN READING AND PROPERLY INTERPRETING DAMAGE CONTROL DIAGRAMS, BLUEPRINTS, DRAWINGS, AND OTHER SIMILAR MATERIAL CONCERNED WITH THEIR DUTIES. 079-21.7 RESPONSIBILITY OF DAMAGE CONTROL PERSONNEL. ALL OFFICERS AND MEN OF THE DAMAGE CONTROL

ORGANIZATION SHOULD OBTAIN A WORKING KNOWLEDGE OF THE ABILITY OF THE SHIP TO RESIST DAMAGE AND REMAIN AFLOAT. BY A THOROUGH STUDY OF THE SHIP AND ITS SYSTEMS, AND BY THE STUDY OF METHODS USED, BOTH SUCCESSFULLY AND UNSUCCESSFULLY, BY OTHER SHIPS IN COMBATING DAMAGE. 079-21.8 EFFICIENCY. THE ENTIRE SHIPS COMPANY SHOULD BE TRAINED TO UNDERSTAND THE NECESSITY FOR MAINTENANCE OF THE HIGHEST DEGREE OF EFFICIENCY IN DAMAGE CONTROL. THIS SHOULD INCLUDE: PROPER SETTING OF MATERIAL CONDITIONS OF READINESS, AND PROPER OPERATION, USE, AND MAINTENANCE FOR DAMAGE CONTROL PURPOSES OF HULL AND ENGINEERING SYSTEMS; AND USE AND MAINTENANCE OF DAMAGE CONTROL MATERIAL AND EQUIPMENT, INCLUDING INTERIOR BATTLE COMMUNICATIONS, LOCATING DAMAGE, SUCH AS LEAKS, AND MAKING EMERGENCY REPAIRS UNDER ADVERSE CONDITIONS.

● ESTABLISHING AND MAINTAINING A RIGID FIRE PREVENTION PROGRAM, AND KNOWING THE CAPABILITIES OF AVAILABLE EQUIPMENT AND THE CORRECT METHODS USED TO COMBAT ALL SHIP FIRES, COMBATING ATTACK BY CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE AGENTS, GIVING FIRST AID TO INJURED PERSONNEL, WHEN DIRECTED TO DARKEN SHIP, CLOSING ALL DOORS, HATCHES, PORTS, AND OTHER FITTINGS WHICH ALLOW INTERIOR LIGHTS TO BE EXPOSED TO THE OUTSIDE. (TRAFFIC OF PERSONNEL FROM THE WEATHER TO THE INTERIOR MUST BE RESTRICTED TO ACCESS OPENINGS FITTED WITH LIGHT TRAPS OR DOOR SWITCHES.) 079-21.9 PERSONNEL SHOULD UNDERSTAND THAT THE SAME DEGREE OF EFFICIENCY IS AS NECESSARY UNDER IN-PORT CONDITIONS AS IT IS UNDER AT SEA CONDITIONS. 079-21.10 OVERLAPPING SKILLS. EACH MEMBER OF A REPAIR PARTY MUST BE A JACK-OF-ALL-TRA EACH MEMBER SHOULD LEARN TO DO ANY JOB THAT MAY BE REQUIRED OF ANY OTHER MEMBER. ELECTRICIANS MATES CAN LEARN TO SHORE, SHIPFITTERS TO HOOK UP THE CASUALTY POWER SYSTEM, AND DAMAGE CONTROL MEN TO PATCH PIPE LINES. ALL HANDS SHOULD LEARN HOW TO FIGHT FIRES AND TO APPLY FIRST AID. EVERY MAN MAY NOT BECOME AN EXPERT IN EVERY FIELD, BUT HE CAN AT LEAST BECOME A CAPABLE HELPER AND IN AN EMERGENCY, HIS

ADDED ABILITY MAY BE NEEDED TO SAVE A SHIP. 079-21.11 TRAINING. IT IS NOT SUFFICIENT THAT PERSONNEL MERELY READ ABOUT HOW TO MAKE REPAIRS, STUDY PICTURES OF EQUIPMENT, OR DISCUSS METHODS, NOR IS IT ENOUGH THAT THEY HAVE ALL THE TOOLS AUTHORIZED BY THE SHIPS HULL ALLOWANCE LIST, OR THAT THEY MAKE ALL THE PREFABRICATED PATCHES AND TOOLS AS MAY BE SUGGESTED. ALL DAMAGE CONTROL PERSONNEL MUST KNOW HOW TO APPLY PRINCIPLES AND USE MATERIALS IN THE MOST EFFECTIVE WAY. THAT KNOWLEDGE CAN BE GAINED BY EDUCATION, TRAINING, AND ACTUAL PRACTICE. 079-21.12 AS EMPHASIZED IN PARAGRAPH 079-21.7, THOROUGH KNOWLEDGE OF THE SHIP IS OF PRIME IMPORTANCE. REPAIR PARTY PERSONNEL MUST KNOW THEIR OWN AREA, THEY ALSO MUST KNOW THE AREAS OF OTHER REPAIR PARTIES, IN CASE THEY HAVE TO MAKE REPAIRS OR ASSIST THOSE REPAIR PARTIES. PERSONNEL SHOULD BE EXCHANGED BETWEEN REPAIR PARTIES FROM TIME TO TIME, IN ORDER THAT THEY MAY TRAIN AND DRILL IN OTHER AREAS.

079-21.13 SIMULATING DAMAGE. TRAINING IN MAKING BATTLE REPAIRS IN SHIPS GENERALLY IS LIMITED BY CIRCUMSTANCES. OCCASIONALLY, THE NEED ARISES TO REPAIR A LEAKY PIPE OR TO RENEW A SMALL CABLE; BUT SELDOM IS THERE A CHANCE FOR THE AVERAGE MEMBER OF A REPAIR PARTY TO DO ANY REAL SHORING, TO STOP A LEAK IN THE HULL, OR TO GAIN EXPERIENCE IN ANY ASPECT OF DAMAGE CONTROL OUTSIDE HIS OWN SPECIALTY. THE MOST IMAGINATIVE AND ENERGETIC ORGANIZATION HAS TO PRETEND DAMAGE HAS OCCURRED. THERE IS NO WAY TO KNOW IF THE SIMULATED REPAIRS MADE WOULD BE EFFECTIVE UNDER THE PRESSURE AND VIBRATION INCIDENT TO BATTLE CONDITIONS. THE TEST COMES WHEN ACTUAL DAMAGE IS SUSTAINED. 079-21.14 TRAINING MOCK-UPS. FIGURES 079-102 AND 079-103 SHOW MOCK-UPS THAT CAN BE USED IN SHIPS FOR TRAINING MEN IN MAKING MANY OF THE SUGGESTED REPAIRS. SMALL GROUPS SHOULD BE DETAILED FOR INSTRUCTION ON THESE MOCK-UPS EACH DAY. WHILE THESE MOCK-UPS ARE FAR SHORT OF ACTUAL BATTLE DAMAGE, THEY WILL GIVE THE MEN GOOD PRACTICE IN USING THEIR HANDS, AND AN OPPORTUNITY TO STUDY BETTER METHODS AND SHORT CUTS FOR MAKING REPAIRS. THE USE OF WATER PRESSURE NOT ONLY MAKES THE INSTRUCTION MORE INTERESTING BUT WILL CONVINCE ALL HANDS OF THEIR NEED OF PRACTICE. FIGURE 079-102, BULKHEAD TRAINING MOCK-UP FIGURE 079-104, PIPING TRAINING MOCK-UP 079-21.15 READING

DIAGRAMS AND DRAWINGS. A THOROUGH UNDERSTANDING OF HOW TO READ AND INTERPRET DIAGRAMS AND DRAWINGS, PARTICULARLY ISOMETRIC AND ORTHOGRAPHIC (MECHANICAL) DRAWINGS, IS ESSENTIAL FOR ALL PERSONNEL IN THE DAMAGE CONTROL ORGANIZATION. DAMAGE CONTROL PERSONNEL ALSO SHOULD HAVE AN UNDERSTANDING OF NAVY SYSTEMS FOR FILING AND STORING BLUEPRINTS AND DRAWINGS. 079-21.16 INSPECTION SCHEDULES 079-21.17 THE COMMANDING OFFICER THROUGH THE DAMAGE CONTROL OFFICER, SHALL PROVIDE FOR AND ENFORCE REGULAR SCHEDULES OF INSPECTION, MAINTENANCE, REPAIR, AND REPLACEMENT TO INSURE WATERTIGHT INTEGRITY, PROPER OPERATION OF HULL AND ENGINEERING SYSTEMS FOR DAMAGE CONTROL, AND PROPER OPERATION OF ALL DAMAGE CONTROL EQUIPMENT AND MATERIALS. A MORE DETAILED DISCUSSION OF DAMAGE CONTROL INSPECTIONS AND TESTS IS INCLUDED IN SECTION 23.

## INSTRUCTIONAL PASSAGES

### ARMY 'NEW LOOK' MANUAL. PERSHING MISSILE SYSTEM PROCEDURAL MANUAL

Don't work on electronic equipment unless someone else is near who knows about the operation and hazards of this equipment. He should also know how to give first aid. If you have a helper, make sure he knows what items are dangerous. Whenever you can, shut off power to the equipment before you start to work on it. Ground every capacitor that is likely to be dangerous. When you are working inside the equipment, and after you have turned off power, ground every part before you touch it. Do not touch high-voltage connections when you install or operate this equipment. Don't be fooled by the term 'low voltage'. You could be killed by as little as 50 volts! Whenever you can, keep one hand away from equipment to reduce the chances of current flowing through vital organs of your body. Read FM 21-11 so you'll know about artificial respiration.

Panel lamps - provide panel lighting. Panel lamps switch - turns panel lamps on and off. Reverse phase lamp - indicates improper phase of ac power from ac generator set 2. Gen no. 1 on lamp - indicates that power is available from ac generator set 1. Gen no. 2 on lamp - indicates that power is available from ac generator set 2. Vent door bypass switch - not used (for maintenance purposes only at a higher level of maintenance). Overvolt lamp - indicates that output voltage from motor generator set 2 is too high. Power on lamp - indicates that motor generator set 2 power is available. Generator on switch - makes output of motor generator set 2 available for distribution. Generator off switch - removes output of motor generator set 2. Motor stop switch - stops motor generator set 2 drive motor. Motor start switch - starts motor generator set 2 drive motor. Voltage increase control - adjusts output voltage from motor generator set 2. Voltmeter - indicates dc output voltage from motor generator set 2.

## INSTRUCTIONAL PASSAGES

NAVPERB 15665C 1104.2.4.5.. 1106.1.. AND 1106.2

The Commandant of each Naval District is assigned the responsibility for establishing and controlling uniform policies within the geographical limits of his District. He shall prescribe uniforms for the season, day or special occasion for all Naval personnel (including Marines under his command) which will provide the greatest uniformity. Personnel of all Naval Activities domiciled within the District shall wear only those uniforms prescribed for personnel assigned to the District. The Commandant may designate sub-areas and assign area coordinators/sea officers present authority to prescribe local uniforms which are compatible with mission and climate. Senior officers present afloat in district waters shall insofar as practicable, follow the uniforms prescribed by the Commandant with regard to liberty parties and members of the command operating ashore. Uniform selections are to be at the discretion of the prescribing authority and not optional to the individual. Local Uniform Regulations shall be promulgated by each Commandant, Area Commander, SOPA or other designated authority utilizing the format provided in the sample instruction appended to this chapter. Uniforms for daily wear are equivalent to civilian business attire and prescribed for normal executive office work, watchstanding, liberty and official business ashore. Service Dress uniforms are normally prescribed as the uniform of the day.

Working uniforms are prescribed for working situations which would unduly soil dress uniforms or dress uniforms would be inconvenient or unsafe. Working uniforms are prescribed as the uniform of the day aboard ship when at sea and are usually permitted for shipboard personnel in port during normal working hours. They may also be worn at shore stations during normal working hours, in industrial areas, and when otherwise deemed appropriate by the Senior Officer Present. Work uniforms normally are not authorized for wear off naval establishments.

## INSTRUCTIONAL PASSAGES

NAVATR 01-40 AVM-2-7.2. PARAGRAPHS 4.5 TO 4.7

A maintenance assurance inspection is required for all maintenance procedures that, if improperly performed, could cause equipment failure or jeopardize ground personnel. An underlined procedural step indicates that a maintenance assurance inspection shall be performed prior to proceeding to the next step. A Maintenance Assurance Summary at the end of a procedure lists the maintenance assurance inspections that shall be performed after completion of the procedure. Clean all parts of the bench test set adapter before and after use to remove dirt, dust, oil, grease, and corrosion-product matter. Wipe surfaces clean with a soft, clean cloth dampened in aliphatic naphtha (TT-N-95). Remove dirt, oil, and grease from the electrical receptacle and connectors with a small, nonmetallic, firm bristle brush moistened with aliphatic naphtha, and dry thoroughly with dry air or soft, clean cloth. After cleaning, apply antiseize compound (TT-A-580) sparingly to the threaded portion of the receptacle. Inspect all parts of the adapter assembly for corrosion, wear, and damage. Check mechanical action of toggle switches and tone generator switch for proper detents. Check continuity of fuses and light with ohmmeter. Examine light assembly lens for cracks. Inspect earphones jack for corrosion and bent contacts. Inspect fuses, fuse holders, and extractor posts for corrosion and damage. Inspect electrical receptacle and connectors for corrosion, security of solder connections, and condition of pins. Inspect all wiring for condition of insulation.

## INSTRUCTIONAL PASSAGES

NAVSEA S9086-CN-STM-00/CH 079 PARAGRAPHS 21.4, 21.11, AND 21.13

In carrying out the provision of implementing directives, the Commanding Officer, through the Executive Officer and the damage control organization, should impress upon all personnel under his command the necessity for obtaining the highest degree of efficiency in the control of damage through thorough understanding and application of damage control principle. It is not sufficient that personnel merely read about how to make repairs, study pictures of equipment, or discuss methods. Nor is it enough that they have all the tools authorized by the Ship's Hull Allowance List, or that they make all the prefabricated patches and tools as may be suggested. All damage control personnel must know how to apply principles and use materials in the most effective way. That knowledge can be gained by education, training, and actual practice. Training in making battle repairs in ships generally is limited by circumstances. Occasionally, the need arises to repair a leaky pipe or to renew a small cable; but seldom is there a chance for the average member of a repair party to do any real shoring, to stop a leak in the hull, or to gain experience in any aspect of damage control outside his own specialty. The most imaginative and energetic organization has to pretend damage has occurred. There is no way to know if the simulated repairs made would be effective under the pressure and vibration incident to battle conditions. The test comes when actual damage is sustained.

## INSTRUCTIONAL PASSAGES

NAVAIR 01-40 AVM-2-7.2 PARAGRAPHS 1-11., 1-12., AND 1-33

The theory of operation text for the system explains how the system performs its functions by utilizing the capabilities of its related circuitry and components. The text is supported by diagrams, charts, and illustrations to assist the user of the manual. Operating instructions for the system include the identification and location of controls, switches, instruments, indicators, and lights as they appear in the aircraft. Instructions are given in normal sequence for activating the system, and all the resulting indications that the system is operating satisfactorily are defined. Subsequent to the publication of the initial issue of the A-4M Technical Manual Maintenance Instructions, changes in the aircraft and equipment, in support concepts and in procedures, as well as additional information developed by experience, affect the contents of the manual.

## INSTRUCTIONAL PASSAGES

NAVAIR 05-35 EAC-1 TABLE 3-2

Attach to top and bottom surfaces of the test set computer to allow the test set computer to be placed on any side surface during maintenance. Used to lift signal converter. Used to remove card assemblies. Gauges torque, within the range of 6 to 100 ounce-inches, applied to screws of replacement assemblies. Gauges torque, within the range of 2 to 30 pound-inches, applied to screws of replacement assemblies. Adapts torque screwdrivers to no. 2 through no.4 Phillips screws. Adapts torque screwdrivers to no. 4 slotted screws. Adapts torque screwdrivers to Allen screwdriver bits of screwdriver set (index number 11), and nutdriver/screw set (index number 12). Hand tools which fit slotted screws and Phillips screws of replacement assemblies. Hand tools which fit nuts of replacement assemblies. Used with torque screwdrivers on Allen screws of replacement assemblies. Used with torque screwdrivers on Phillip screws, slotted screws, and nuts of replacement assemblies. Gauges torque, within the range of 0 to 200 pound-inches, applied to jam nuts of replacement assemblies. Used to remove and replace test set switches. Used to remove and replace jamnuts of test set computer malfunction indicators and reset switch. Adapts 3/8-inch drive torque wrench to sockets with 1/2-inch drives. Used to remove and replace connector jamnuts of cable, harness, and back panel assemblies from their respective mounting surfaces. Used to insert the roll pin of test set computer page assembly jackscrews. Used to removed and insert the roll pin of the test set computer mounting bolts. Used to make contact with test points on page assembly A6 during strobe pulse adjustment.

## INSTRUCTIONAL PASSAGES

NAVAIR 05-35 EAC-1 PARAGRAPHS 4-6 THROUGH 4-8

The tactical computer set solves a navigation function five times a second and a weapon delivery function 25 times a second, when required. The operating mode of the tactical computer set is determined by an external

master function switch. The results of the computations can be displayed by the tactical computer control and/or by the interface components having displayed capabilities such as the head-up display, etc. The pilot monitors the displays to steer the aircraft to a desired destination or target. The tactical computer performs the arithmetic and logical computations required to solve navigation and weapons delivery functions. The tactical computer operates under control of the self-contained program to accept and retain data from the tactical computer control and the external equipment until needed. The tactical computer executes the operations directed by the program to solve the functions required using externally supplied data and previously stored data as necessary. The results of the computations are transmitted as display data or discrete commands to the tactical computer control or external equipment. Data is transmitted to and from the tactical computer as either serial digital signals or analog signals. The tactical computer modifies the interface signals as necessary to provide a compatible signal interface with the external equipment. Power application to the electronic circuits of the tactical computer set is controlled by the COMPUTER toggle switch on the tactical computer control. The tactical computer control will also control power application to the Loran equipment (growth item) and enable the pilot to select the Loran operating mode. Built-in tests of the tactical computer set are also activated by the COMPUTER toggle switch on the tactical computer control.

## PROCEDURAL TEST PASSAGES

NAVAIR 01-245 FDN-2-8.5. PARAGRAPHS 3-419 AND 3-422

Procedure. Open radome and extend radar package per figure 3-2. a. Is el strobe positioned correctly on one indicator? b. Adjust RD or PILOT A GUN V CENT. Is malfunction corrected? c. Replace A3720 (aft) or A3719 (fwd) for correct indication. d. Rotate elevation control. Does elevation strobe move? e. Replace control-power supply per paragraph 3-910. f. Place POWER to TEST and TEST to 2. Does elevation strobe position to +40 elevation. g. Does elevation strobe move. h. Does antenna vernier indicate +40 +2 elevation? i. Is 13.84Vac present at TP4920? j. Remove hydraulic power. Pin antenna at BST. Adjust B6215. k. Perform antenna hydraulic balance. Can balance be performed? l. Replace antenna per paragraph 3-873. m. Is malfunction corrected? n. Is elevation strobe within +2 of 40? o. Replace roll and climb assembly per paragraph 3-913. p. Place TEST to 0 and POWER to STBY. Adjust EL STROBE CENT ADJ to position elevation strobe at zero. Is malfunction corrected? q. Replace the indicator control unit per paragraph 3-940.

Procedure. Open radome and extend radar package per figure 3-2. a. Place POWER to TEST; MODE to MAP; TEST to 2. Does B-sweep position to 20 right and elevation strobe to 40 up? b. Replace control-power supply per paragraph 3-910 or K4807. c. Replace radar set control per paragraph 3-969.

## PROCEDURAL TEST PASSAGES

NAVAIR 01-245 FDN-2-8.5. PARAGRAPH 3-670

Procedure. Open radome and extend package per figure 3-2. a. Is GYRO IN light (TS-1828D/A) illuminated? b. Short 1J3/22 to ground. Does GYRO IN light illuminate? c. Replace 1A3 platter. d. Does continuity exist between 1J5/M and 1J3/22? e. Does continuity exist between 1P5/M and 3P1/w? f. Repair AMCS package wiring. g. Does continuity exist between 3J1/w and 3J2/x? h. Replace radar modular per paragraph 3-994. i. Repair wiring between 73P414/x(3P2 and 73P404/AB(AMCS test panel). j. Does continuity exist between 1J3/53 and 73P404/w? k. Repair aircraft wiring between 1J3/53 and 73J404/w.

Procedure. Open radome and extend radar package per figure 3-2. a. Is malfunction common to all stations? b. Is malfunction at wing station? c. Is malfunction common to all fuselage stations? d. Press warning lights test switch (fwd cockpit). Does SELECTED light illuminate? e. Replace SELECTED light(s) bulb. for station connected? Does SELECTED light illuminate? f. Replace missile status panel per paragraph 3-959. Does SELECTED light illuminate? g. Repair wiring from missile firing relay panel to missile status panel. Refer to NAVAIR 01-245FDN-2-10. h. Check continuity of applicable wiring. Does continuity exist? i. Repair wiring. j. Replace tuning drive per paragraph 3-1030. Does SELECTED light illuminate? k. Check continuity of applicable wiring from 62P416A to 63P355A (missile firing relay panel assembly). Does continuity exist? l. Is malfunction at fwd station? m. Replace missile firing relay panel assembly per paragraph 3-956. n. Check continuity for applicable station.

## PROCEDURAL TEST PASSAGES

NAVAIR 01-245 FDN-2-8.5. PARAGRAPH 3-1171

Error Detector Balance. Back Bias. a. Position control as follows. b. Connect test cable between A300J2 on AN/APM130 and J114. Place S2206, on the synchronizer, to TEST and press S2205. Rotate R2226 to its midrange position. c. Connect test probe from METER IN to ERROR DET OUT A3003/TP6. d. Connect TP2209 to ground. e. Observe meter while RDR RCVR ST and press S2205. Rotate R2226 to its midrange position. c. Connect test probe from METER IN to ERROR DET OUT A3003/TP6. d. Connect TP2209 to ground. e. Observe meter while RDR RCVR gain is increased. c. adjust DL2207 to 0.01-usec steps to increase time delay. g. Repeat step f until change in voltage at A3003/TP6 is less than 0.004Vdc as RDR RCVR GAIN is alternately rotated from ccw to cw position. h. Remove meter lead from A3003/TP6. i. Position AN/APM-130 controls as follows. j. Place TEST (ARSC) to 1 and S2206 to OPERATE. Lock on 2 target. k. Adjust FREQUENCY & NULL REFERENCE dial to produce a null on meter with VOLTAGE SCALE at 0.40. l. Place POWER (RSC) to STBY. Observe meter for drift of range voltage. Range voltage does not change more than 0.060Vdc before system unlocks. If voltage change is greater than 0.060Vdc, adjust B.B. BAL A3003/R39 to correct for drift. m. Repeat steps j, k and l until range voltage drift is as close to zero as possible, but less than 0.060Vdc.

## PROCEDURAL TEST PASSAGES

NAVATR 01-245 FDN-2-8.5. PARAGRAPHS 3-920 THROUGH 3-926

Removal. a. Place both generator control switches to OFF. b. Disconnect two air lines from aft end of unit. c. Loosen wing nut on clamp until clamp can be released. Released clamps. Slide unit out of clamp and remove from aircraft. Installation. a. Place both generator control switches to OFF. b. Place unit in clamp with air connections aft. c. Latch clamp (loosen wing nut if necessary) and tighten wing nut finger-tight. d. Connect and tighten two air lines to unit. e. Perform checks required per table 3-14.

DISTRIBUTION BOX. The distribution box is located in the aft cockpit, mounted on the underside of the shelf that mounts the stabilization data generator forward and below the right console. Removal. CAUTION Exercise care during replacement of distribution box to prevent damage to fuel drain lines. a. Place both generator control switches to OFF. b. Remove stabilization data generator. c. Disconnect electrical connector. d. Hold unit and remove four mounting screws. e. Remove unit from aircraft.

Installation. a. Place both generator control switches to OFF. b. Inspect electrical connector for damage and corrosion and wiring for chafing, fraying and security of harness. (Quality Assurance) c. Hold unit in mounting position and install four mounting screws. d. Connect electrical connector. e. Install stabilization data generator. f. Perform checks required per table 3-14. ELECTRICAL SYNCHRONIZER. The synchronizer is located in the nose equipment compartment mounted on the left side forward end of the electrical equipment rack and is accessible with the radome open and the radar package extended. Removal. a. Open radome and extend AMCS radar package per figure 3-2. b. Disconnect P2201, P2202, P2203, P2204, P2205 and P2206 from underside of unit. c. Loosen two bolts on the clamps at bottom of unit that attach to hinge bar. d. Hold unit in position and loosen two bolts at top of unit securing unit to electrical equipment rack. e. Lower unit to end of safety cable travel. hold unit. release safety cable and lift unit off hinge bar.

PROCEDURAL TEST PASSAGES

NAVAIR 01-245 FDN-2-8.5. PARAGRAPH 3-1175

Five-second Unlock Time Delay. a. Position controls as follows. b. Lock on any target, and allow 5 seconds for system to stabilize. c. Place TEST (ARSC) to 0 and measure time required for system to unlock as indicated by indicator display returning to search. Time delay is 5+1 seconds. Check target detector balance (refer to paragraph 3-1170). If balance is satisfactory, adjust A3001/R12 so time delay is 5+1 seconds.

PROCEDURAL TEST PASSAGES

NAVAIR 05-35 EAC-1 PARAGRAPH 7-103

To remove blower B1 (4, figure 7-9) from the tactical computer proceed as follows: **WARNING** Make certain power is removed from the tactical computer prior to removing the blower. a. Slide rubber shroud up harness (18) and remove three screw-mounted terminal clips from blower; retain screws and washers for reassembly. b. Remove three screw-hole plugs (6) from front of blower. c. While supporting blower with one hand, remove three socket-head mounting screws (5) and lift blower from tactical computer; retain screws and gasket (7) for reassembly. **NOTE** Disassemble blower only to the extent required for replacement or repair of defective components. d. Remove air inlet ring cover (4B). e. Loosen two hex socket setscrews on impeller (4C) sufficiently for removal of impeller from shaft of motor assembly. f. Remove impeller. g. Remove impeller blower housing (4D) from motor assembly (4F) by removing four machine screws (4E) and retain screws for reassembly.

PROCEDURAL TEST PASSAGES

NAVAIR 05-35 EAC-1 PARAGRAPH 7-109

To remove main store array assembly A9 (1, figure 7-10) from the tactical computer, proceed as follows: **NOTE** The tactical computer must be removed from the test set prior to removing the main store array assembly. a. Remove left cover (2) by removing 28 mounting screws (3, figure 7-9). b. Remove four array assembly mounting screws (2, figure 7-10) and four associated fiber washers (4). **CAUTION** Array assembly Allen jackscrews located on lower mounting flanges must be alternately loosened two turns at a time, to prevent damage to array assembly. As array assembly Allen jackscrews are loosened, washers (3) become freed. Observe that washers do not become misplaced. **NOTE** Allen screwdriver set is supplied with the test set special tools. c. Alternately loosen four array assembly Allen jackscrews located on lower mounting flanges, two turns at a time, until array assembly is disengaged from frame. d. Carefully lift array assembly from frame.

#### PROCEDURAL TEST PASSAGES

##### NAVAIR 05-35 EAC-1 PARAGRAPH 8-22

To remove display assembly A3 (22, figure 8-3) from the tactical computer control, proceed as follows: a. Remove two knobs (2 and 3, figure 8-2) by loosening three setscrews. b. Remove four screws (4), two screws (5) and associated washers (6) and rubber grommets (7). c. Gently pry the lighting panel (14) from control to disengage connector; then, remove lighting panel. d. Remove right cover (15) by removing 12 screws (16). e. Remove seven screws (2, figure 8-3) and one screw (3); then, carefully pull out front panel assembly (1) to gain access to interior of control. f. Remove 4 screws (23, figure 8-3) that secure the 15 lamp segment of the display assembly to the front panel.

#### PROCEDURAL TEST PASSAGES

##### NAVAIR 05-35 EAC-1 PARAGRAPH 8-25

To remove rf filters FL1 through FL4 (26 and 27, figure 8-3) from the tactical computer, proceed as follows: a. Remove left and right covers (15, figure 8-2) by removing 24 screws (16). CAUTION Page assembly jackscrews must be alternately loosened, three turns at a time, to prevent damage to alignment pins and page assembly frame. b. Remove two page assemblies (20 and 21, figure 8-3) by alternately loosening four page assembly jackscrews, three turns at a time, until page assemblies are disengaged from frame; carefully lift page assemblies from frame. c. Dismount cable receptacle 2J1 from rear panel by removing four screws (15) and nuts (19). NOTE Filters FL1 through FL4 are mounted in respective order, top to bottom. d. Tag and unsolder lead from left side of defective rf filter. e. Remove two bracket mounting screws (29). f. Move bracket (28) to right side opening as far as cabling permits; then, tag and unsolder lead from right side of defective rf filter. g. Dismount defective rf filter from bracket by removing nut and washer.

REFERENCES FOR PROCEDURAL AND INSTRUCTIONAL TEST PASSAGES

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- NAVSEA S9086-MD-STM-000/CH 400. Electronics. 1 June 1976. Change, 1 November 1977. Naval Sea Systems Command.
- NAVSEA S9086-CZ-STM-000/CH 090. Inspections, Tests, Records, and Reports. 15 February 1977. Change, 15 December 1977. Naval Sea Systems Command.
- NAVSEA S9086-K9-STM-000/CH 330. Lighting. 1 June 1977. Change, 15 May 1979. Naval Sea Systems Command.

TAEG Report No. 83

REFERENCES FOR NAVSEA TEST PASSAGES (continued)

NAVSEA S9086-WK-STM-000/CH 670. Storage, Handling and Disposal of Hazardous General Use Consumables. 1 August 1978. Change, 1 February 1979. Naval Sea Systems Command.

APPENDIX G

HOW TO USE TAEGs COMPUTER READABILITY EDITING SYSTEM

To use TAEGs Computer Readability Editing System, an author would key into the computer a sample of text such as that shown in figure G-1, which is the author's writing before any computer editing has been done. To find out whether Navy personnel will be able to read this writing, and to receive suggestions on how to make it more readable, the sample of text is processed by the computer. Figure G-2 is a computer printout containing the output of the editing system.

The output in figure G-2 consists of the text with suggested changes as well as Notes, Readability Results, and Words Not on Basic List. The single most important indicator of text readability is Grade Level, listed under Readability Results. This measure is computed by the Flesch-Kincaid Reading Ease Formula. Also found under Readability Results is the information that the formula uses to compute the grade level--average number of words per sentence and average number of syllables per word. In this example, the grade level is 16.6. If the intended readers have an average reading grade level below this level, the author should try to reduce the reading grade level. This will most certainly be the case here, since the average reading level for Navy enlisted personnel is about the 10th grade.

Specific suggestions on how to reduce the grade level are found in other features of the editing system. One of these is the flagging of uncommon words. Within the text of figure G-2, all uncommon words have been enclosed in parentheses. These same words are listed with their frequencies of occurrence under Words Not on Basic List at the bottom of the printout. The uncommon words are words that are not on the Common Word List; they are words with which most readers are not familiar. To make the text more readable, the author should try to replace these words with simpler words; if that is not possible, then the author should consider defining the word, either in context or in a glossary.

The word-substitution feature of the editing system has placed in brackets all words recommended for replacement. These are words for which specific substitutes are recommended. The brackets are shown in the text of figure G-2. Each word in brackets is followed by its proposed substitute(s) in brackets and in capital letters. The author should decide whether to use one of these substitutes or to retain the original word. In most cases, one of the substitutes will help to improve the readability of the text.

Sentences that are too long have been flagged with a number between slash marks following each such sentence. Under Notes, this number appears again with information on the amount of words in the sentence. The author should try to rewrite such sentences so as to make them shorter.

Figure G-3 shows how the text is rewritten using the suggestions of the editing system. The author uses proofreading symbols to indicate corrections to be made on the editing system output. Many of the uncommon words in parentheses have been deleted as shown by the ~~\_\_\_\_\_~~ through them. Some of these have been replaced with simpler words; for example, "housed" for

"domiciled." Other uncommon words have only been deleted, such as "geographical." Several uncommon words have been retained and were not marked; for example, "sub-areas." There is no more suitable replacement for this word. In every case the author makes a final decision on the suggestions made by the editing system.

The author's response to the sentence length flagged by the editing system might influence the choice of words described above. The first sentence of figure G-3 is flagged with /1/, and under notes the /1/ indicates 23 words in the sentence. The author has responded by deleting several words from the sentence. The author's response to the long sentence, marked by note /5/, has been to divide it into two sentences. Throughout the editing process, the author's judgment plays a critical role, especially in rewriting long sentences. Throughout figure G-3, examples of human judgment in editing can be seen. However, the need for the CRES is shown by the suggestions in the edited text which guide the author by pointing out problems that the human editor might not have seen.

The next step in the editing process is to analyze the edited product of figure G-3 using the computer editing program again. This step checks the results of the first editing. Figure G-4 shows the output of the editing system after analyzing the edited text of figure G-3. The average number of words per sentence has been reduced from 22.66 to 15.38, while the average number of syllables per word has been reduced slightly. As a result, the grade level of the text has been reduced from 16.6 to 11.2, a reading level much closer to the skill of Navy personnel. The number of uncommon words has been reduced from 13 to 2. These two words are uncommon but the author considered them essential to the meaning of the text.

The final product appearing in figure G-5 resulted through the combination of the analysis of the CRES plus the author's acting on the suggested changes. The result in figure G-5 is a much more readable sample of text than the original version of figure G-1. A comparison of the text in the two figures clearly points this out.

The Commandant of each Naval district is assigned the responsibility for establishing and controlling uniform policies within the geographical limits of his district. He shall prescribe uniforms for the season, day, or special occasion for all Naval personnel (including Marines under his command) which will provide the greatest uniformity. Personnel of all Naval activities domiciled within the district shall wear only those uniforms prescribed for personnel assigned to the district. The Commandant may designate sub-areas and assign area coordinators/senior officers present authority to prescribe local uniforms which are compatible with mission and climate. Senior officers presently afloat in district waters shall, insofar as practicable, follow the uniforms prescribed by the Commandant with regard to liberty parties and members of the command operating ashore.

Uniform selections are to be at the discretion of the prescribing authority and not optional to the individual.

Local uniform regulations shall be promulgated by each Commandant, area Commander, SOPA, or other designated authority utilizing the format provided in the sample instruction appended to this chapter.

Uniforms for daily wear are equivalent to civilian business attire and are prescribed for normal executive office work, watchstanding, liberty, and official business ashore. Service dress uniforms are normally prescribed as the uniform of the day.

Figure G-1. Sample of Text Taken from the Navy's Uniform Policy Regulations (NAVPERS 15665C, 1978) Before Processing by TAEGs Computer Readability Editing System. (Readability is at the College Graduate Level.)

TAEG Report No. 83

The Commandant of each Naval District is assigned the  
MISSPELLED WORD IS FLAGGED  
(responsabilitu) for <establishing> <\*SETTING UP.PROVING\*> and  
controlling uniform policies within the [geographical] limits of  
his District. (1) He shall prescribe uniforms for the season, day  
(2) LONG SENTENCE IS FLAGGED AND FOOTNOTE PRODUCED  
or special occasion for all Naval personnel (including Marines  
under his command) which will <provide> <\*GIVE.SAY\*> the greatest  
UNCOMMON WORD IS FLAGGED  
(uniformity.)/2/ Personnel of all Naval Activities (domiciled)  
\*  
within the District shall wear only those uniforms prescribed for  
personnel assigned to the District. The Commandant may  
<designate> <\*APPOINT.CHOOSE\*> [sub-areas] and assign area  
[coordinators/senior] officers present authority to prescribe local  
uniforms which are [compatible] with mission and climate./3/  
\*  
Senior officers present afloat in district waters shall [insofar]  
as [practicable.] follow the uniforms prescribed by the Commandant  
with [regard] to liberty parties and members of the command  
<operating> <\*RUNNING.WORKING\*> ashore./4/ Uniform  
\*  
<selections> <\*CHOICES\*> are to be at the discretion of the  
prescribing authority and not optional to the individual. Local

Figure G-2. Same Sample of Text After Computer Processing. Various Features of the System are Annotated.

T A E G Report No. 83

TWO EASIER SUBSTITUTES ARE OFFERED FOR DIFFICULT WORD

Uniform Regulations shall be <promulgated> <\*ANNOUNCED,ISSUED\*> by  
each Commandant, Area Commander, SOPA or other  
<designated> <\*APPOINTED,CHOSE/CHOSEN\*> authority  
<utilizing> <\*USING\*> the format <provided> <\*GAVE/GIVEN.SAID\*> in  
the sample instruction [appended] to this chapter./5/ Uniforms for  
\*  
daily wear are <equivalent> <\*EQUAL\*> to civilian business [attire]  
and prescribed for normal executive office work. [watchstanding.]  
liberty and official business ashore./6/ Service Dress uniforms  
\*  
are normally prescribed as the uniform of the day.

-----NOTES-----

- / 1/ This sentence contains 23 words - consider shortening it.
- / 2/ This sentence contains 26 words - consider shortening it.
- / 3/ This sentence contains 23 words - consider shortening it.
- / 4/ This sentence contains 30 words - consider shortening it.
- / 5/ This sentence contains 28 words - consider shortening it.
- / 6/ This sentence contains 23 words - consider shortening it.

----- READABILITY RESULTS -----

Number of Sentences	Number of Words	Number of Syllables
9	204	404

Figure G-2. Same Sample of Text After Computer Processing. Various Features of the System are Annotated (continued)



TAEG Report No. 83

The Commandant of each Naval District is assigned the  
[responsability] for ~~establishing~~ <sup>P</sup> ~~and~~ ~~controlling~~ ~~uniform policies within the [geographical] limits of~~ ~~his District.~~ <sup>and Marine</sup> ~~1/ He shall prescribe uniforms for the season, day~~  
\* or special occasion for all Naval ~~personnel~~ ~~including Marines~~  
~~under his command~~ <sup>be most uniform.</sup> which will ~~provide~~ ~~the greatest~~  
~~uniformity~~ <sup>housed</sup> ~~1/2/ Personnel of all Naval Activities, [domestic]~~  
\* within the District shall wear only those uniforms prescribed for  
~~personnel assigned to~~ the District. The Commandant may  
~~designate~~ ~~sub-areas~~ <sup>He may also</sup> ~~assign~~ ~~area~~  
(coordinators <sup>and</sup> senior) officers present <sup>^</sup> authority to prescribe local  
uniforms which <sup>meet</sup> ~~are compatible with~~ mission and climate <sup>needs</sup> ~~1/3/~~  
\* Senior officers present afloat in district waters shall ~~insofar~~  
~~as practicable~~ <sup>much as possible</sup> follow the uniforms prescribed by the Commandant <sup>^</sup>  
~~This applies~~ <sup>both</sup> ~~with freedom~~ <sup>personnel</sup> ~~to liberty parties and members of the command~~  
~~operating~~ ~~ashore.~~ <sup>4/</sup> Uniform  
\* ~~selections~~ ~~are to be at the discretion of the~~  
prescribing authority and not optional to the individual. Local

Figure G-3. Same Printout with Editing Notes

Uniform Regulations shall be ~~promulgated~~ ~~ANNOUNCED~~ ~~ISSUED~~ by  
each Commandant, Area Commander, SOPA or other

~~designated~~ ~~APPOINTED~~ ~~CHOSE~~ ~~CHOSEN~~ authority

~~utilizing~~ ~~USING~~ the format ~~provided~~ ~~GAVE~~ ~~GIVEN~~ ~~SAID~~ in

the sample instruction, <sup>attached</sup> ~~forwarded~~ to this chapter, <sup>shall be used</sup> /5/ Uniforms for

daily wear are <sup>used like</sup> ~~equivalent~~ ~~EQUAL~~ to civilian business <sup>clothes</sup> ~~attire~~

They are used for things like <sup>standing watch</sup> ~~and prescribed for normal executive~~ office work. <sup>watch standing</sup> ~~if~~

liberty and official business ashore. /6/ Service Dress uniforms

are normally prescribed as the uniform of the day.

-----NOTES-----

- / 1/ This sentence contains 23 words - consider shortening it.
- / 2/ This sentence contains 26 words - consider shortening it.
- / 3/ This sentence contains 23 words - consider shortening it.
- / 4/ This sentence contains 30 words - consider shortening it.
- / 5/ This sentence contains 28 words - consider shortening it.
- / 6/ This sentence contains 23 words - consider shortening it.

-----READABILITY RESULTS-----

Number of Sentences	Number of Words	Number of Syllables
9	204	404

Figure G-3. Same Printout with Editing Notes  
(continued)



TAEG Report No. 83

The Commandant of each Naval District is assigned the responsibility for setting up and controlling uniform policies within his District. He shall prescribe uniforms for the season, day or special occasion for all Naval and Marine personnel which will be most uniform. Personnel of all Naval Activities housed within the District shall wear only those uniforms prescribed for the District. The Commandant may choose [sub-areas.] He may also assign area [coordinators] (or senior officers present) authority to prescribe local uniforms which meet mission and climate needs. Senior officers present afloat in district waters shall, as much as possible, follow the uniforms prescribed by the Commandant. This applies to both liberty parties and personnel working ashore. Uniform choices are to be at the discretion of the prescribing authority and not optional to the individual. Local Uniform Regulations shall be issued by each Commandant, Area Commander, SOPA or other chosen authority. The format given in the sample instruction attached to this chapter shall be used. Uniforms for daily wear are used like civilian business clothes. They are used

Figure G-4. Passage After Changes Suggested by Computer Analysis

TAEG Report No. 83

for things like office work, standing watch, liberty and official business ashore. Service Dress uniforms are normally prescribed as the uniform of the day.

----- READABILITY RESULTS -----			
Number of Sentences	13	Number of Words	200
		Number of Syllables	354
Avg. Number of Words per Sentence	15.38	Avg. Number of Syllables per Word	1.77
GRADE LEVEL	(Based on DOD Readability Standard)		
11.2			
----- WORDS NOT ON BASIC LIST -----			
WORD	FREQ	WORD	FREQ
coordinators	1	sub-areas	1

Figure G-4. Passage After Changes Suggested by Computer Analysis (continued)

The Commandant of each Naval district is assigned the responsibility for setting up and controlling uniform policies within his district. He shall prescribe uniforms for the season, day, or special occasion for all Naval and Marine personnel which will be most uniform. Personnel of all Naval activities housed within the district shall wear only those uniforms prescribed for the district. The Commandant may choose sub-areas. He may also assign area coordinators (or senior officers present) authority to prescribe local uniforms which meet mission and climate needs. Senior officers presently afloat in district waters shall, as much as possible, follow the uniforms prescribed by the Commandant. This applies to both liberty parties and personnel working ashore.

Uniform choices are to be at the discretion of the prescribing authority and not optional to the individual.

Local uniform regulations shall be issued by each Commandant, area Commander, SOPA, or other chosen authority. The format given in the sample instruction attached to this chapter shall be used.

Uniforms for daily wear are used like civilian business clothes. They are used for things like office work, standing watch, liberty, and official business ashore. Service dress uniforms are normally prescribed as the uniform of the day.

Figure G-5. Final Manuscript of Revised Text After Processing by TAEGs Computer Readability Editing System. (Readability is at the High School Level.)

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ILM**