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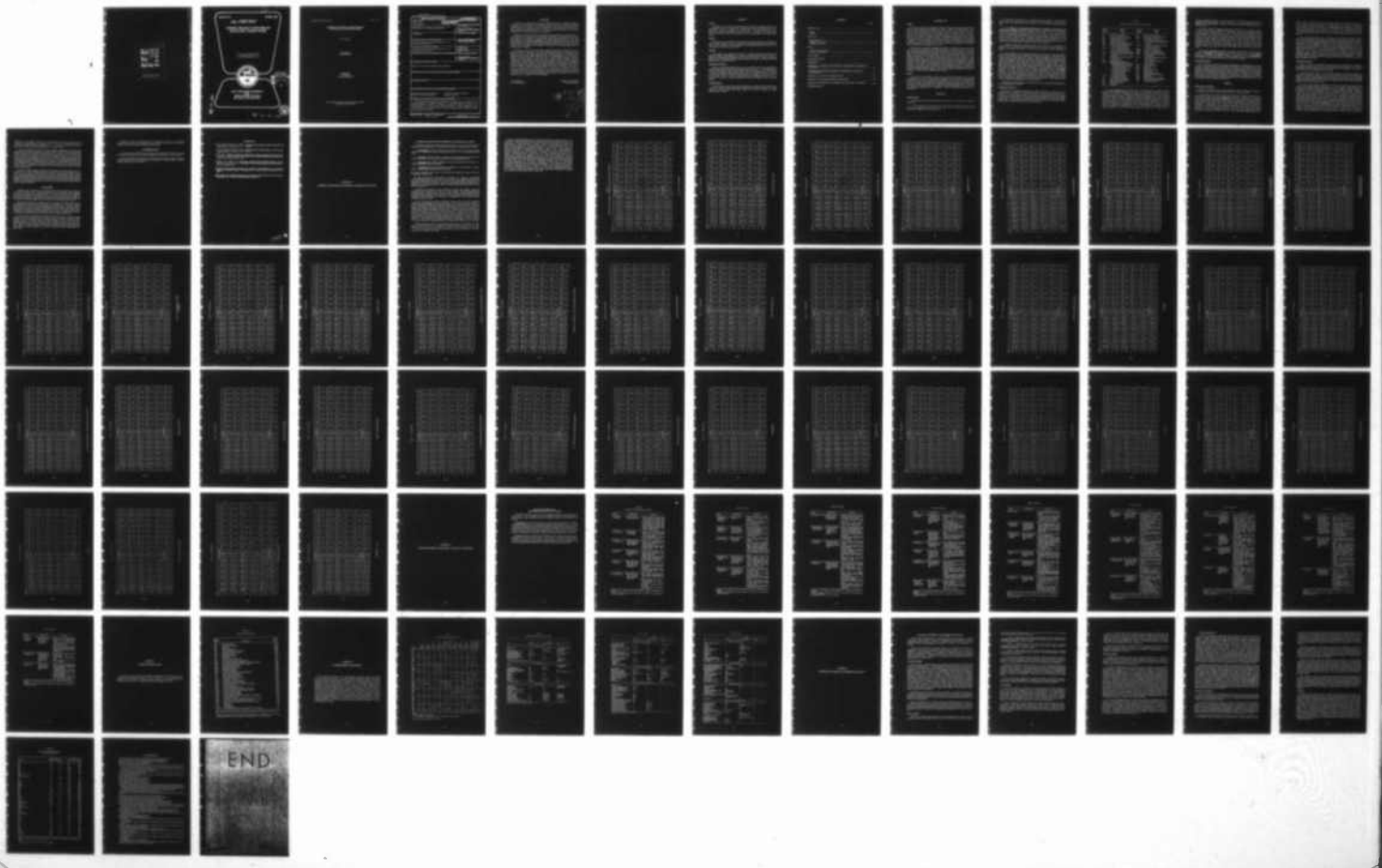

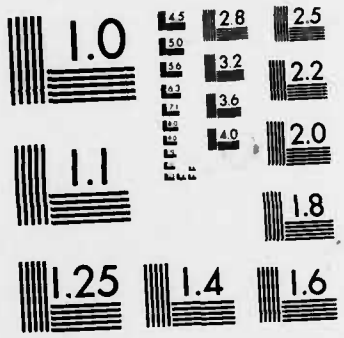

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PERSONNEL AVAILABILITY PROJECTIONS FOR SELECTED NAVY TECHNICAL RATINGS

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NPRDC Special Report 84-1 October 1983

PERSONNEL AVAILABILITY PROJECTIONS FOR SELECTED NAVY TECHNICAL RATINGS

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Operational performance of future advanced technology Navy ship systems may be seriously degraded if projected availability of appropriate support personnel is not considered early in system design. This report provides personnel projections for 41 ratings susceptible to impacts of technological advances. Serious shortages are likely to continue for the forseeable future for ratings associated with missiles and related control and sensor systems.

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FOREWORD

This effort was conducted under project 63564N (Surface Ship CONFORM Technology Forecasts) and was sponsored by Commander, Naval Sea Systems Command (NSEA-31). The objective of the project is to provide guidance for research and development (R&D) priorities based on an assessment of the future whole ship impact of projected technological advances and their implications. A principal concern of NAVSEA is the personnel supportability of proposed ship system developments.

The objective of this effort was to extend personnel availability projections to the year 2000 for those ratings most susceptible to the impacts of technological advances. This information is intended to provide personnel supportability guidance to system long-range planners and designers very early in the system development process. By using these projections in selecting hardware system design options, engineers and others in the R&D community can help control or reduce personnel requirements, especially in shortage ratings, and thus improve the likelihood the systems will be manned appropriately to perform to fleet standards.

It should be noted that the personnel availability projections presented herein are based on personnel requirements and inventory data extracted from OPNAV data bases that may or may not yet reflect rating structure changes in progress. For example, as of September 1983, the following ratings are known to be undergoing one or another kind of change: ASH, ASM, FTG, FTM, GSE, GSM, and OT. These changes should not materially affect the overall projections in the near term. It takes time for changes to be fully implemented. For example, the TD rating, disestablished in 1982, will not be completely phased out until 1988. Further, the elimination or addition of ratings does not necessarily mean the elimination or addition of their related requirements and resources but rather a somewhat different distribution and/or identification of them. The projections for the far term, in contrast, become increasingly "soft" in that they are subject not only to intervening changes in the rating structure but also numerous factors, both within and outside the Navy, which cannot be predicted. They can, however, be assumed to provide an indication of the natures and relationships of personnel availabilities that can be expected for various genereal technical categories.

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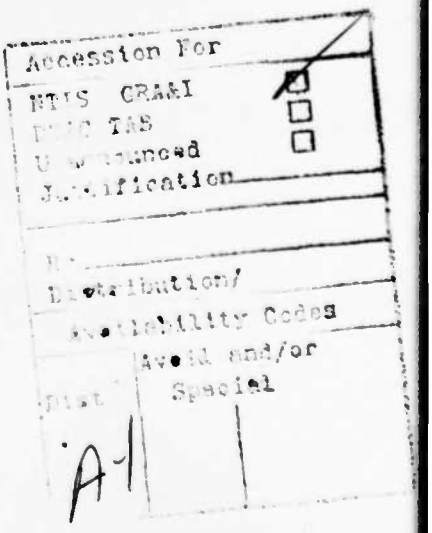

SUMMARY

Problem

The degree to which advanced technology systems perform at designed levels in the fleet depends, in part, on the availability of adequate numbers of appropriately skilled and experienced personnel to operate and maintain them. Personnel supportability thus becomes an important consideration in system design. To be useful for system design, however, projections of personnel availability must be available early in the system design process.

Purpose

The purpose of this effort was to extend personnel availability projections to the year 2000 for those ratings most likely to be affected by advanced technological developments. These data are needed to provide guidance to long-range planners very early in the conceptualization of future ship systems.

Approach

Forty ratings were selected on the basis of current shortages, association with advanced systems, technological work content, and susceptibility to impact of known or potential technological developments. Personnel availability data for these ratings were developed from requirements and inventory projections provided by the Chief of Naval Operations (OP-11G and OP-135D).

Results and Conclusions

Reliable, valid numerical projections could be extended only to the year 1996 for personnel requirements and 1988 for personnel inventories. Because of the magnitude of shortages and overages, trends toward improvement or degradation, and the time required to correct deficiencies and/or reverse trends within the personnel system, it can be assumed that the general availability conditions found in the projections will continue into the foreseeable future. Serious projected personnel shortages were found to exist primarily in a cluster of ratings associated with missile and related control and sensor systems.

Recommendation

System developers should pay particular attention to design options and alternatives that would control or reduce the personnel requirements of ratings associated with future missile and related control and sensor systems if they are to perform to design expectations in the fleet.

CONTENTS

INTRODUCTION

Problem

To fulfill its mission in the national interest, the Navy must develop equipment and systems utilizing advanced technologies and science. These new systems generate a wide variety of skill, knowledge, and experience requirements for their operation and maintenance. Insofar as these systems are additions to the existing fleet inventory, they will obviously make additional demands on personnel resources. Insofar as they are replacements for or successors to existing systems, their personnel requirements may be greater than, less than, and/or different from those of presently existing systems. In any event, the degree to which new systems will function at optimum or designed levels will depend in large part on the availability of sufficient numbers of personnel with appropriate capabilities to operate and maintain them. Thus, the prospective availability of personnel must be considered in the design of new systems.

Although the Navy has been reasonably successful in recruiting first-term personnel, it has not been as successful in retaining those personnel, especially those in a variety of high technology fields, beyond their initial enlistments. Thus, the Navy has not only been faced with continuing personnel shortages of varying types and magnitudes in the more advanced skill levels but it has also been forced to divert substantial resources of time, money, facilities, and short-supply experienced personnel into the training of new, replacement personnel. As a result, many Navy systems are being manned by fewer personnel and/or personnel of lower skill and experience levels than needed for optimum or designed system performance. Since new systems normally must "compete" with other existing or new systems for needed operators and maintainers, personnel supportability becomes an even more critical consideration in the design of new systems. However, for personnel supportability data to have any real impact on system design, such data must be available to design engineers early in the system design and development sequence, preferably at the concept formulation stage or before.

Purpose

It may take up to 20 years or more for a new system to progress from its initial conceptualization to initial fleet introduction, depending on the status of the technologies incorporated into it and its magnitude and complexity. The purpose of this project was, therefore, to extend current personnel availability projections to the year 2000 for those ratings most likely to be impacted by advanced technological developments. These data are needed to provide guidance to long-range planners and designers of ship systems so that personnel availability can be considered in system conceptualization, design, and development.

APPROACH

Rating Selection

The following provided the basis for selecting ratings for inclusion in the availability projections:

1. Since the focus of the project was on "ship" (surface and submarine) systems, all ship ratings categorized as "semi-technical," "technical," or "highly technical" by CNO (OP-11) were included in the initial ratings cut.

2. Reports on and projections of personnel shortages published by CNO (OP-136D) and the Navy Personnel Research and Development Center (Koehler, 1982; Koehler & Miller, 1979) were reviewed to identify ratings in which shortfalls existed during prior years.

3. The Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NAVPERS 18068D) provides occupational and work content descriptions of ratings and equipment assigned to those ratings. Thus, it was examined in detail to determine (a) the susceptibility of ratings to the impact of technological change, and (b) the relationships among ratings, systems, and technologies. Various types of work are often shared or performed by more than one rating and various systems are sometimes manned by more than one rating. Therefore, since personnel supportability of a new system might be affected by the personnel availabilities of more than one rating, it was decided that all related ratings should be included in the projections.

4. Finally, ratings were included based on (a) the advice of knowledgeable and experienced Navy military and civilian personnel, and (b) the known, expected, or potential technological development trends that may impinge on various occupational areas.

It should be noted that the selection strategy was quite "loose." Since technological advances may develop in many unexpected directions, the selection orientation was to "screen in" rather than "screen out" ratings. Evidence was sought to accept ratings for inclusion rather than to reject them. Because the project focused on ship systems, ratings not directly associated with ship systems (e.g., construction ("Sea Bee"), administrative, logistics, and health care ratings) were typically rejected, at least initially. Certain "ship" ratings, such as boiler technician, hull maintenance technician, and machinery repairman, were also excluded. While these ratings may involve highly refined, advanced skills and/or advanced materials or procedures, it was determined that the systems associated with them were not likely to change significantly due to technological advances. In contrast, ratings that are not strictly ship ratings, such as ocean systems technician and a variety of aviation ratings, were included. Since these ratings were found to be associated with types of work, systems, and/or technologies similar to those of the ship ratings, they represented something of a common talent "population" for which the ship ratings must compete or from which they might draw. They could thus be a factor in the personnel supportability of future systems.

The selection process resulted in the inclusion of the 40 ratings listed alphabetically by rating abbreviation in Table 1.

Availability Projections

Existing Navy operational computerized systems were used to project personnel requirements and inventories because this allowed (1) operational data banks to be accessed, thus eliminating the costly need for accumulating comparable data independently, and (2) project personnel to test whether these systems were intrinsically capable of providing the practical, far long-range projections needed for guiding ship system design. Also, it was assumed that the data in the systems were the most valid and reliable available, and the systems themselves, the most advanced.

Table 1

Ratings Included in Personnel Projections

Rating Abbrev.	Rating Title	Rating Abbrev.	Rating Title
AC	Air traffic controller	ET	Electronics technician
AD	Aviation machinist's mate	EW	Electronics warfare technician
AE	Aviation electrician's mate	FTB	Fire control technician (ballistic missile fire control)
AG	Aerographer's mate		
AO	Aviation ordnanceman	FTG	Fire control technician (gun fire control)
AQ	Aviation fire control technician		
ASE	Aviation support equipment technician (electrical)	FTM	Fire control technician (surface missile fire control)
ASM	Aviation support equipment technician (mechanical)	GMG	Gunner's mate (guns)
		GMM	Gunner's mate (missiles)
AT	Aviation electronics technician	GMT	Gunner's mate (technician)
AW	Aviation antisubmarine warfare operator	GSE	Gas turbine system technician (electrical)
AX	Aviation antisubmarine warfare technician	GSM	Gas turbine system technician (mechanical)
BM	Boatswain's mate	IC	Interior communications electrician
CT(x)	Not official; combines the following branches of cryptologic technician (CT) rating:	IM	Instrumentman
		MM	Machinist's mate
	• Administrative (CTA)	MN	Mineman
	• Interpretive (CTI)	MT	Missile technician
	• Communications (CTO)	OM	Opticalman
	• Collection (CTR)	OS	Operations specialist
	• Technical (CTT)	OT	Ocean systems technician
CTM	Cryptologic technician (maintenance branch)	RM	Radioman
		STG	Sonar technician (surface)
DP	Data processing technician	STS	Sonar technician (submarine)
DS	Data systems technician	TM	Torpedoman's mate
EM	Electrician's mate		
EN	Engineman		

Personnel requirements data, obtained from a computer printout provided by OP-11G January 1983, essentially represent an inventory of established, documented personnel requirements of current, scheduled, and planned Navy activities, missions, and systems. Current requirements are a composite of those identified principally in ship manpower documents (SMDs), squadron manpower documents (SQMDs), and similar manning documents. Since these requirements are determined by applying various work study and related techniques, it can be assumed that they are well established and validated. Current requirements are modified for future years based on such factors as ship or system life expectancies, programmed ship commissionings/decommissionings, scheduled system installations or retirements, etc. They are reduced by the known personnel demands associated with the old equipments being retired, and increased by the

anticipated personnel demands of the new equipments (as identified in such documents as Personnel and Training Plans). Requirements data are all documented and are thus relatively "hard" data, based on objective, controlled procedures and methodologies for their generation.

In contrast, personnel inventory projections, obtained from a computer print-out provided by OP-135D March 1983, are not "hard" data. They were generated by the force structure projection computer model (known as FAST), developed by NAVPERSRANDCEN and implemented by CNO (OP-01) as a part of the Navy advanced manpower planning system (NAMPS). The FAST model uses historical, periodically updated, personnel data as a basis for simulating the flow of personnel through the personnel system under various assumptions about authorized ceilings, recruitment levels, retention-attrition rates, advancement ratios, "school seat" availabilities, etc. Given the basic input data and assumptions, the model can project the numbers of personnel in each pay grade of each rating for each year for as far out as one might want to "run" the model. For NAMPS purposes, however, the projection normally encompasses only the current year plus 6 out years.

The personnel availability projections are simply the differences between projected personnel requirements and inventories, expressed either in terms of the numerical shortages or overages of inventory related to requirements or the percentages of requirements the numerical shortages or overages represent. Both were determined, since both expressions may be useful and either alone might be misleading.

Preferential Manning

Since the Navy has experienced personnel shortages of varying degree for a number of years, it attempts to man its commands and activities on a "fair share" basis. Each command or activity receives its "fair share" of the quantitative and qualitative personnel resources available so that shortages (or overages) are shared equally by all. Not all Navy missions and responsibilities have equal priority, however. Those that are considered significantly more important than others receive preferential treatment in their manning. Since the use of the personnel availability projections may be affected by the Navy's policies concerning preferential manning, the project sponsor requested that these policies be examined and their implications determined.

RESULTS

Limitations on Projections

Personnel projections could not be extended to the year 2000; the requirements projections reach to 1996, but the inventory projections reach only to 1988.

As noted earlier, the computer printout from which the projected personnel requirements were obtained contains only documented requirements. (However, an examination of the data provided in this printout suggests that, in a few cases, this may not be entirely true.) Unless personnel limitations are mandatorily included in the conceptualization of or specifications for a new system (which is highly improbable), the system's personnel requirements are specified, for the first time, during the initial system training plans conference. Understandably, these conferences typically are not held until the system is far enough along so that personnel and training requirements can be identified. Characteristically, they are held approximately 6 or 7 years (often later, rarely sooner) before the system is introduced in the fleet. Thus, the limit of documented total requirements is

about 7 years. Beyond that time, documented requirements should be expected to "decline" as systems are retired from fleet inventory before the personnel requirements of their successors have been identified. This apparent decline in personnel requirements can be noted in a number of the projections. The farther the projections are extended beyond the approximate 7-year "limit," the "softer" and more unreliable they become, even though they are presumably documented. It appears that 14 years is the maximum time that requirements projections can be made with reasonably acceptable reliability and validity.

The inventory projections are even more severely time limited. Although the FAST model uses historical data and trends, its projections are based upon numerous assumptions. These assumptions may be completely valid for the projection base year. However, since many of them are dependent on factors and conditions external to the Navy (e.g., Congressional ceiling, budgetary limitations, civilian economic conditions, etc.), it is virtually certain that they will not remain valid for any appreciable period of time. The longer-range the projections are, of course, the greater the likelihood they will be invalid. Indeed, the FAST model is used operationally to, in effect, "invalidate" its own assumptions. One of its major uses is to test "what would happen if" type questions regarding possible changes to the personnel system or personnel policies. Feasible favorable changes often are implemented, thus changing the whole projection. A 6-year projection has been found to be about the maximum that can meaningfully, practically, and cost-effectively be made.

Synopsis of Projections

Appendix A presents the detailed rating-by-rating numerical projections of personnel availibilities; Appendix B, a summary of those projections; and Appendix C, a listing of the ratings, in order of magnitude of their projected maximum requirements, for use as a ready reference to the relative sizes of the ratings.

Of the 40 included ratings, 5 show projected overages of personnel inventory over personnel requirements (AT, BM, GMG, OM, and possibly MN), 16 show approximate equality of inventory and requirements (AC, AD, AE, AG, AO, ASM, AX, DP (although variable within the rating), DS, EM, EN, ET, IC, IM, MM, and STS), and 19 show significant projected shortages (AQ, ASE, AW, CTM, CT(x), EW, FTB, FTG, FTM, GMM, GMT, GSE, GSM, MT, OS, OT, RM, STG, and TM).

Of the 19 "short" ratings, it appears that 5--AW, CTM, CT(x), MT, and RM--could improve toward satisfying their requirements. For the remainder, the magnitude of the shortage or the pattern within their structure make it very doubtful that the shortage will be overcome within the foreseeable future. Although special attention, programs, incentives, etc. may be instituted to improve the "health" of these ratings, it will take time for the results of any such efforts to be effective. For example, in the EW and GSM ratings, the severe shortages at the E-6 and E-7 levels are not likely to be alleviated soon since lesser shortages also exist at the lower pay grades. Particularly troublesome might be the FTG, OS, and STG ratings, all of which have significant, continuing shortages projected at the E-4 and E-6 levels. The OS rating also has shortages at the E-7 level; and the FTG and STG ratings, sizeable overages at the E-4 level and somewhat lesser overages at the E-7 level. A closer examination than can be made here would be necessary to determine the cause or causes of the wave-like shortage-overage phenomenon in these ratings. It appears, however, that the E-4 shortages may reflect an insufficiency of personnel with the necessary aptitude requisites for entry into the ratings. The overages at the E-5 and shortages at the E-6 levels might reflect a change in direction, degree, or

emphasis in the requisites necessary for advancement within the ratings such that numerous E-5s, although fully competent at the E-5 level, do not possess the special aptitudes or talents required for progression to the E-6 level. Whatever the cause or causes, the shortages do exist and apparently will continue to exist.

It should be noted that the seven "short" shipboard ratings—EW, FTB, FTG, FTM, GMM, GMT, and STG—all involve the operation and/or maintenance of technologically advanced, sophisticated weapons-related equipment and systems. (The MT rating would also be included in this group on the basis of continuing shortages at the E-6 and E-7 levels, except that the projections indicate steady improvement toward eliminating those shortages.) Since these ratings tend to rely on "pools" of personnel possessing much the same intellectual and aptitudinal characteristics, they are in competition with each other for available personnel. It is likely that any new systems increasing the numerical or skill level demands for personnel with those characteristics either will not be adequately manned or will be manned at the expense of other weapons-related systems that are already undermanned.

The GSE and GSM ratings also involve technologically advanced systems but of a different sort. It may be hypothesized that the current GSE and GSM shortages result in part from the relatively recent introduction of gas turbine propulsion systems, the lag time in the personnel system to respond to those systems' needs (wherein lies a moral for early identification of personnel and training requirements of developing systems), and the increase in the number of gas turbine power plants as the Navy builds to a 600 ship fleet. Whether these shortages will improve or worsen as gas turbine propulsion becomes more common remains to be seen.

CONCLUSIONS

It appears that the projection of documented total numerical personnel requirements is limited to about 7 years. Partial requirements can be projected, with acceptable accuracy and reliability, for approximately 8 or 9 years beyond this period, based on anticipated retirements of operational systems from fleet inventories even though the personnel requirements of their successor systems have not been identified. Beyond that time, however, numerical projections as such become too unreliable for practical use.

Requirements projections are based on known, relatively controllable factors related to programmed introduction and retirement of Navy systems. In contrast, inventory projections must rely on assumptions regarding many variable factors. Although some of these factors are wholly or partially controllable within the Navy, others (e.g., civilian demographic and economic factors) are outside Navy control. Until those factors can be projected with greater accuracy and reliability than at present, it appears that projection of acceptably valid numerical personnel inventories is limited to about 6 years.

The most serious and persistent personnel shortages exist within a cluster of ratings associated with missile systems and the sensor and control systems related to those weapons. Thus, new missile, sensor, and control systems are likely to be faced with manning problems. Since the majority of those ratings are fairly small (i.e., total requirements are less than 3,000), competition for available personnel may be especially acute. Relatively minor reductions in the personnel requirements of new systems of these types could, in contrast, appreciably improve the effective personnel availabilities for those ratings.

Appendix D presents rating-equipment cross-indices that show the relationships among ratings, systems, and technologies. Finally, Appendix E discusses the implications of preferential manning policies and related considerations.

RECOMMENDATIONS

Design engineers and system planners should use the personnel projections presented herein as general guidance as to the likely availability of personnel to man new systems.

Particular attention should be given to controlling and reducing, insofar as feasible, personnel requirements for the operation and maintenance of missile systems and their associated sensor and control systems.

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APPENDIX A

NUMERICAL PROJECTIONS OF PERSONNEL AVAILABILITIES BY RATING

NUMERICAL PROJECTIONS OF PERSONNEL AVAILABILITIES BY RATING

This appendix presents personnel availability projections for 40 ratings listed alphabetically by rating abbreviation. The following information is provided for each rating:

1. Requirements—The total number of personnel of the rating and pay grade identified in official documents as being needed as of the end of the designated fiscal year.

2. Inventory—The total number of personnel of the rating and pay grade projected by the FAST model to be on board as of the end of the designated fiscal year.

3. Difference—The numerical difference between requirements and inventory. A negative difference identifies a shortage.

4. Percentage—The numerical difference expressed as a percentage of requirements. A negative percentage identifies a shortage.

For reasons discussed in the report, requirements are projected to the year 1996 and inventories to the year 1988.

No data are given for pay grades E-1 through E-3. Specific, rating-related requirements generally are not "written" for these levels. Also, personnel at these levels are, for the most part, undergoing recruit and initial training. While personnel might be designated as "striking" for a rating or might be in specialized training for entrance into a rating, they are not identified beyond generic apprenticeships (e.g., airman (AN), fireman (FN), or seaman (SN).

Pay grades E-4 through E-7, which represent the day-to-day, "hands-on" specialist skill levels, are of primary importance for system design. The tables present the availability data for these levels in two ways: (1) for the four pay grades combined and (2) for each pay grade separately. This allows the reader to determine the overall personnel availability for the rating and the distribution of availabilities of the several pay grade skill levels within the rating.

The E-7 (chief petty officer) is generally looked upon as the fully qualified, experienced, technical expert in the field of his or her rating. The E-8 and E-9 (senior and master chief petty officers) are sometimes thought of as "super technicians." However, billets at the E-8 and E-9 levels, typically accounting for from 2.5 to 4.0 percent of a rating's total billets, increasingly tend to involve technical supervision, management, administration, planning, command advisement, etc., rather than direct, personal involvement with systems. Since the E-7 level represents a transition from the hands-on technician to the technical administrator, the E-7 may be considered in either category. For this reason, the E-7 level has been combined with the E-8 and E-9 levels to provide an indication of the availability of technical administrative-management support within the rating. As a result, the E-7 level appears three times in the tables: (1) in the composite at the top of the table, (2) separately, and (3) in the composite at the bottom of the table.

Certain ratings, such as fire control technician (FT), gunner's mate (GM), or aviation support technician (AS), are not included in the tables, since they exist only at the E-8 and/or E-9 levels (AS from E-6 through E-9). They have been incorporated into the tables as artificial extensions of the service ratings feeding into them in proportion to the sizes of those service ratings to each other.

Planners should understand that the availability projections reported here are but indications of general approximations of future personnel requirements, inventory, and availabilities. It cannot be said, for example, that there will be exactly 291 FTB E-5s on board to satisfy exactly 309 FTB E-5 billets in 1985. The data bases from which the projections were obtained are updated periodically. Each update will likely result in at least some differences in the projected numerical values. Thus, if the availabilties reported herein were to be based on more recent projections, they would probably be somewhat different from those presented. In addition, the rating structure itself is subject to evolutional change. For example, as of 31 August 1983, the following structure changes were underway or proposed. FTG and FTM being combined as FC (Fire Controlman); ASM and ASH being combined as ASM, with ASE remaining as a separate rating; combination of GSE and GSM into GS being lowered from the E-8 to the E-7 level; OT being split into OTA (Operations Technician--Analyst) and OTM (Operations Technician--Maintainer) as the surface counterparts of the AW and AX ratings respectively; GMG and GMM proposed for combination as GM (Gunner's Mate); and AX proposed for combination with AT. However, it takes time for significant changes to work their way through the personnel system. It may take years--perhaps longer than the time required to conceive and develop a new system--for personnel shortages or overages to be corrected or undesirable trends to be reversed.

Table C-1

NUMERICAL PROJECTIONS OF PERSONNEL AVAILABILITIES BY RATING

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2782	3082	2717	2717	2742	2725	2710	2729	2767	2769	2790	2796	2790	2803	2798
I	2271	2389	2601	2702	2796	2893	2933								
DIFF	-511	-693	-116	-15	54	168	223								
%	-18	-22	-4	-1	2	6	8								
E-4															
R	1211	1201	1197	1197	1201	1200	1194	1197	1207	1207	1213	1212	1211	1215	1213
I	572	655	824	872	924	943	943								
DIFF	-639	-546	-373	-325	-277	-257	-251								
%	-53	-45	-31	-27	-23	-21	-21								
E-5															
R	810	791	778	778	791	783	777	786	804	804	814	818	814	819	817
I	817	815	866	898	934	988	1014								
DIFF	7	24	88	120	143	205	237								
%	1	3	11	15	18	26	31								
E-6															
R	514	504	499	499	504	499	495	499	507	507	510	511	510	513	512
I	647	689	678	697	698	712	721								
DIFF	133	185	179	198	194	213	226								
%	26	37	36	40	38	43	46								
E-7															
R	247	246	243	243	246	243	244	247	249	251	253	255	255	256	256
I	235	230	233	235	240	250	255								
DIFF	-12	-16	-10	-18	-6	7	11								
%	-5	-7	-4	- 3	-2	3	5								
E-7 through E-9															
R	342	340	336	336	339	336	337	340	342	345	347	349	349	350	350
I	307	306	310	314	323	335	342								
DIFF	-35	-34	-26	-22	-16	-1	5								
%	-10	-10	- 8	-7	-8	0	1								

AC

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	8767	9059	9250	9381	9389	9366	9354	9366	9380	9385	9387	9396	9391	9394	9394
I	8345	8879	9335	9547	9993	10119	10250								
DIFF	-422	-180	85	166	604	753	896								
%	-5	-2	1	2	6	8	10								
E-4															
R	2737	2840	2913	2965	2964	9252	2945	2952	2952	2956	2959	5963	2963	2363	2963
I	2600	2829	3133	3037	3178	3220	3220								
DIFF	-137	-11	220	72	214	268	272								
%	-5	0	8	2	7	9	9								
E-5															
R	2746	2864	2939	2992	2996	2990	2992	2998	3002	3006	3010	3014	3013	3015	3015
I	2481	2624	2827	2961	3206	3279	3363								
DIFF	-265	-240	-112	-31	210	289	371								
%	-10	-8	-4	-1	7	10	12								
E-6															
R	2335	2386	2410	2421	2424	2418	2411	2413	2419	2418	2416	2417	2414	2415	2415
I	2354	2559	2508	2673	2722	2715	2747								
DIFF	19	173	98	252	298	297	336								
%	1	7	4	10	12	12	14								
E-7															
R	949	969	988	1003	1005	1006	1003	1003	1007	1005	1002	1002	1001	1001	1001
I	910	867	867	876	887	905	920								
DIFF	-39	-102	-121	-127	-118	-101	-83								
%	4	11	12	13	12	10	8								
E-7 through E-9															
R	1515	1543	1575	1601	1609	1613	1611	1613	1621	1618	1615	1617	1616	1616	1616
I	1447	1441	1452	1472	1490	1520	1544								
DIFF	-68	-102	-123	-129	-119	-93	-67								
%	-4	-7	-8	-8	-7	-6	-4								

AD

AVIATION MACHINIST'S MATE

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	6520	6804	6983	7129	7143	7131	7117	7133	7144	7155	7162	7171	7169	7176	7179
I	6021	6332	6642	6822	7154	7378	7480								
DIFF	-499	-472	-341	-307	11	247	363								
%	-8	-7	-5	-4	0	3	5								
E-4															
R	1936	2040	2116	2176	2181	2178	2175	2180	2183	2187	2190	2194	2194	2195	2196
I	1936	2121	2229	2146	2300	2437	2438								
DIFF	0	81	113	-30	119	259	263								
%	0	4	5	-1	5	12	12								
E-5															
R	2424	2527	2610	2681	2690	2688	2688	2697	2699	2706	2711	2716	2715	2719	2721
I	2097	2175	2356	2475	2625	2703	2771								
DIFF	-327	-352	-254	-206	-55	15	83								
%	-13	-14	-10	-8	-2	1	3								
E-6															
R	1660	1718	1725	1734	1736	1732	1723	1724	1728	1728	1727	1727	1276	1727	1727
I	1514	1562	1585	1720	1740	1742	1767								
DIFF	-146	-156	-140	-14	4	10	44								
%	-9	-9	-8	-1	0	1	3								
E-7															
R	500	519	532	538	536	533	531	532	534	534	534	534	534	535	535
I	474	474	472	481	489	496	504								
DIFF	-26	-45	-60	-57	-57	-37	-27								
%	-5	-9	-11	-11	-9	-7	-5								
E-7 through E-9															
R	834	860	882	895	893	290	887	888	891	891	891	891	891	892	892
I	793	811	813	826	840	858	873								
DIFF	-41	-49	-69	-69	-53	-32	-14								
%	-5	-6	-8	-8	-6	-4	-2								

AE

AVIATION ELECTRICIAN'S MATE

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1346	1342	1343	1378	1392	1396	1382	1391	1418	1408	1409	1412	1407	1413	1415
I	1302	1323	1358	1363	1394	1476	1495								
DIFF	- 44	- 19	15	- 15	2	80	113								
%	- 3	- 1	1	- 1	0	6	8								
E-4															
R	439	431	431	434	442	444	433	439	458	450	450	451	449	453	455
I	479	491	491	472	488	519	519								
DIFF	40	60	60	38	46	75	86								
%	9	14	14	9	10	17	20								
E-5															
R	392	393	393	418	420	421	417	418	424	420	420	420	419	420	420
I	362	353	376	389	404	433	443								
DIFF	- 30	- 40	- 17	- 29	- 16	12	26								
%	- 8	- 10	- 4	- 7	- 4	3	6								
E-6															
R	357	359	360	368	372	372	373	376	378	378	379	381	380	381	381
I	314	333	346	356	355	372	378								
DIFF	- 43	- 26	- 14	- 12	- 17	0	5								
%	- 12	- 7	- 4	- 3	- 5	0	1								
E-7															
R	158	159	159	158	158	159	159	158	158	160	160	160	159	159	159
I	147	146	145	146	147	152	155								
DIFF	- 11	- 13	- 14	- 12	- 11	- 7	- 4								
%	- 7	- 8	- 9	- 8	- 7	- 4	- 3								
E-7 through E-9															
R	218	217	217	217	219	219	219	220	222	222	223	224	224	224	224
I	202	206	207	208	210	216	221								
DIFF	- 16	- 11	- 10	- 9	- 9	- 3	2								
%	- 7	- 5	- 5	- 4	- 4	- 1	1								

AG

AEROGRAPHER'S MATE

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	5136	5219	5262	5317	5386	5460	5396	5467	5551	5554	5557	5578	5575	5626	5629
I	4676	4938	5079	5119	5299	5440	5510								
DIFF	- 460	- 281	- 183	- 198	- 87	- 20	114								
%	- 9	- 5	- 3	- 4	- 2	0	2								
E-4															
R	1779	1796	1805	1807	1839	1856	1837	1872	1898	1908	1918	1933	1931	1946	1946
I	1758	1903	1918	1867	1954	2014	2014								
DIFF	- 21	107	113	60	115	158	177								
%	- 1	6	6	3	6	9	10								
E-5															
R	1596	1642	1665	1703	1717	1747	1728	1745	1771	1772	1773	1777	1777	1786	1789
I	1340	1374	1490	1543	1621	1673	1715								
DIFF	- 256	- 268	- 175	- 160	- 96	- 74	- 13								
%	- 16	- 16	- 11	- 9	- 6	- 4	- 1								
E-6															
R	1331	1346	1355	1367	1384	1409	1385	1398	1427	1419	1410	1411	1410	1433	1433
I	1201	1277	1289	1323	1335	1354	1374								
DIFF	- 130	- 69	- 66	- 44	- 49	- 55	- 11								
%	- 10	- 5	- 5	- 3	- 4	- 4	- 1								
E-7															
R	430	435	437	440	446	448	446	452	455	455	456	457	457	461	461
I	377	384	382	386	389	399	407								
DIFF	- 53	- 51	- 55	- 54	- 57	- 49	- 39								
%	- 12	- 12	- 13	- 12	- 13	- 11	- 9								
E-7 through E-9															
R	563	570	572	576	583	586	580	587	594	594	593	593	593	599	599
I	493	506	507	516	520	534	545								
DIFF	- 70	- 64	- 65	- 60	- 63	- 52	- 35								
%	- 12	- 11	- 11	- 10	- 11	- 9	- 6								

AO

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2426	2500	2508	2538	2550	2553	2537	2555	2579	2587	2597	2602	2602	2615	2616
I	2191	2323	2495	2570	2647	2682	2714								
DIFF	- 235	- 177	- 13	32	97	129	177								
%	- 10	- 7	- 1	1	4	5	7								
E-4															
R	761	788	781	786	786	787	787	790	788	796	802	805	805	805	805
I	714	816	900	917	954	960	960								
DIFF	- 47	28	119	131	168	173	173								
%	- 6	3	15	17	21	22	22								
E-5															
R	809	840	861	895	905	914	911	918	930	930	937	938	938	944	945
I	762	795	871	926	957	985	1032								
DIFF	- 47	- 45	10	31	52	71	121								
%	- 6	- 5	1	3	6	8	13								
E-6															
R	612	626	621	614	616	613	602	607	618	618	616	615	615	621	621
I	497	495	506	509	513	510	491								
DIFF	- 115	- 131	- 115	- 105	- 103	- 103	- 111								
%	- 19	- 21	- 19	- 17	- 18	- 17	- 18								
E-7															
R	244	246	245	243	243	239	237	240	243	243	242	244	244	245	245
I	218	217	218	218	223	227	231								
DIFF	- 26	- 29	- 27	- 25	- 20	- 12	- 6								
%	- 11	- 12	- 11	- 10	- 8	- 5	- 3								
E-7 through E-9															
R	399	394	406	409	410	407	405	409	412	412	414	414	414	418	418
I	374	378	382	383	390	397	404								
DIFF	- 25	- 16	- 24	- 26	- 20	- 10	- 1								
%	- 6	- 4	- 6	- 6	- 5	- 2	0								

AQ

AVIATION FIRE CONTROL TECHNICIAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	742	752	741	742	753	754	750	760	771	773	778	784	780	784	780
I	508	627	667	654	664	684	688								
DIFF	- 234	- 125	- 74	- 88	- 89	- 70	- 62								
%	- 32	- 17	- 10	- 12	- 12	- 9	- 8								
E-4															
R	232	240	229	229	235	235	237	243	245	250	255	258	256	259	257
I	102	201	224	199	198	206	199								
DIFF	- 130	- 39	- 5	- 30	- 37	- 29	- 38								
%	- 56	- 16	- 2	- 13	- 16	- 12	- 16								
E-5															
R	280	282	282	283	287	287	285	288	292	291	291	294	293	293	292
I	228	240	257	266	278	287	295								
DIFF	- 52	- 42	- 25	- 17	- 9	0	10								
%	- 19	- 15	- 9	- 6	- 3	0	4								
E-6															
R	182	181	181	181	182	183	180	181	185	183	183	183	182	183	182
I	137	145	145	148	147	149	151								
DIFF	- 45	- 36	- 36	- 33	- 35	- 34	- 29								
%	- 25	- 20	- 20	- 22	- 19	- 19	- 16								
E-7															
R	48	49	49	49	49	49	48	48	49	49	49	49	49	49	49
I	41	41	41	41	41	42	43								
DIFF	- 7	- 8	- 8	- 8	- 8	- 7	- 5								
%	- 15	- 16	- 16	- 16	- 16	- 14	- 10								
E-7 through E-9															
R	62	64	64	64	64	64	63	63	65	65	65	65	65	65	65
I	60	61	61	62	62	64	66								
DIFF	- 2	- 3	- 3	- 2	- 2	0	3								
%	- 3	- 5	- 5	- 3	- 3	0	5								

ASE

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1481	1502	1487	1484	1503	1508	1504	1520	1539	1538	1543	1551	1547	1553	1550
I	1361	1531	1504	1587	1508	1559	1571								
DIFF	- 120	- 71	17	3	5	51	67								
%	- 8	- 5	1	0	0	3	4								
E-4															
R	448	468	453	451	461	465	468	477	482	486	491	497	494	495	494
I	468	523	561	515	516	537	530								
DIFF	20	55	108	64	55	72	62								
%	4	12	24	14	12	15	13								
E-5															
R	573	576	576	576	582	582	580	585	591	590	590	593	592	594	593
I	472	471	508	529	550	572	587								
DIFF	- 101	- 105	- 68	- 47	- 32	- 10	7								
%	- 18	- 18	- 12	- 8	- 5	- 2	1								
E-6															
R	363	361	361	360	363	364	360	362	69	369	364	364	364	366	365
I	324	341	340	347	345	351	354								
DIFF	- 39	- 20	- 21	- 13	- 18	- 13	- 6								
%	- 11	- 6	- 6	- 4	- 5	- 4	- 2								
E-7															
R	97	97	97	97	97	97	96	96	97	97	98	97	97	98	98
I	97	96	95	96	97	99	100								
DIFF	0	- 1	- 2	- 1	0	2	4								
%	0	- 1	- 2	- 1	0	2	4								
E-7 through E-9															
R	126	125	127	127	128	128	126	127	129	129	130	129	129	131	131
I	141	143	143	147	147	149	152								
DIFF	15	18	16	20	19	21	26								
%	12	14	13	16	15	16	21								

ASM

AVIATION SUPPORT EQUIPMENT
TECHNICIAN (MECHANICAL)

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	9369	9523	9644	9764	9803	9796	9768	9817	9871	9898	9927	9950	9945	9971	9997
I	8824	9256	9569	9802	10269	10469	10616								
DIFF	- 545	-267	- 75	38	466	673	848								
%	- 6	- 3	- 1	0	5	7	9								
E-4															
R	2880	2948	2978	3018	3018	3005	2992	3007	3018	3032	3047	3052	3052	3062	3072
I	2952	3122	3197	3145	3347	3434	3435								
DIFF	72	174	219	127	329	429	443								
%	2	6	7	4	11	14	15								
E-5															
R	3525	3522	3576	3625	3648	3646	3644	3666	3684	3698	3711	3729	3726	3731	3736
I	3067	3205	3427	3591	3822	3913	4012								
DIFF	- 458	- 317	- 149	- 34	174	267	368								
%	- 13	- 9	- 4	- 1	5	7	10								
E-6															
R	2143	2205	2221	2234	2245	2250	2242	2250	2266	2266	2267	2268	2266	2272	2278
I	2040	2166	2180	2279	2303	2308	2341								
DIFF	- 103	- 39	- 41	45	58	58	99								
%	- 5	- 2	- 2	2	3	3	4								
E-7															
R	821	848	869	887	892	895	890	894	903	902	902	901	901	906	911
I	765	763	765	787	797	814	828								
DIFF	-56	- 85	-104	-100	- 95	- 81	- 62								
%	- 7	- 10	- 12	- 11	- 11	- 9	- 7								
E-7 through E-9															
R	1236	1272	1297	1313	1316	1314	1306	1314	1322	1324	1326	1328	132	1331	1335
I	1077	1186	1202	1225	1236	1263	1284								
DIFF	- 159	-86	- 95	- 88	-79	- 51	- 22								
%	- 13	- 7	- 7	- 7	- 6	- 4	- 2								

AT

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2812	3087	3248	3321	3349	3355	3349	3363	3379	3388	3397	3403	3403	3411	3411
I	2378	2479	2595	2807	2913	2966	2953								
DIFF	- 434	- 608	- 653	- 514	-436	- 389	- 396								
%	- 15	- 20	- 20	- 15	-13	- 12	- 12								
E-4															
R	627	756	839	843	856	856	860	867	867	872	877	884	884	884	884
I	640	623	684	744	799	807	749								
DIFF	13	- 133	-155	- 99	- 57	- 49	- 111								
%	2	- 18	- 18	- 12	- 7	- 6	- 13								
E-5															
R	1113	1193	1238	1279	1287	1292	1283	1287	1297	1300	1302	1301	1301	1306	1306
I	808	888	952	1043	1085	1118	1146								
DIFF	- 305	- 305	- 286	- 236	- 202	- 174	-137								
%	- 27	- 26	- 23	- 18	- 16	- 13	- 11								
E-6															
R	752	800	824	844	849	851	848	850	854	855	856	856	856	858	858
I	654	688	682	727	730	735	746								
DIFF	- 98	-112	-142	-117	-119	-116	-102								
%	- 13	- 14	- 17	- 14	- 14	- 14	- 12								
E-7															
R	320	338	347	355	357	356	358	359	361	361	362	362	362	363	363
I	276	280	277	293	299	306	312								
DIFF	- 44	- 58	- 70	- 62	- 58	- 50	-46								
%	- 14	- 17	- 20	- 17	- 16	- 14	- 13								
E-7 through E-9															
R	432	452	461	469	473	472	475	477	475	478	481	482	482	483	483
I	385	395	393	410	416	427	435								
DIFF	- 47	- 57	- 68	- 59	- 57	- 45	- 40								
%	- 11	- 13	- 15	- 13	- 12	- 10	- 8								

AW

AVIATION ANTISUBMARINE WARFARE
OPERATOR

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1757	1890	1980	2048	2060	2063	2058	2066	2076	2082	2087	2088	2088	2095	2102
I	1576	1597	1738	1895	1961	2032	2056								
DIFF	- 181	- 293	- 242	- 153	- 99	- 31	- 2								
%	- 10	- 16	- 12	- 7	- 5	- 2	0								
E-4															
R	504	544	575	599	603	604	602	604	608	610	612	612	612	614	616
I	377	371	468	539	560	593	587								
DIFF	- 127	- 173	- 107	- 60	- 43	- 11	- 15								
%	- 25	- 32	- 19	- 10	- 7	- 2	- 2								
E-5															
R	634	684	717	740	745	745	745	749	751	753	755	757	757	759	761
I	628	641	681	733	773	798	819								
DIFF	- 6	- 43	- 36	- 7	28	53	74								
%	- 1	- 6	- 5	- 1	4	7	10								
E-6															
R	455	482	494	506	509	511	508	510	514	516	517	516	516	519	522
I	405	422	425	450	499	455	461								
DIFF	- 50	- 60	- 69	- 56	- 60	- 56	- 47								
%	- 11	- 12	- 14	- 11	- 12	- 11	- 9								
E-7															
R	164	180	194	203	203	203	203	203	203	203	203	203	203	203	203
I	166	163	164	173	179	186	189								
DIFF	2	- 17	- 30	- 30	- 24	- 17	- 14								
%	1	- 9	- 15	- 15	- 12	- 8	- 7								
E-7 through E-9															
R	246	259	270	280	280	275	278	278	278	278	278	278	278	278	278
I	245	246	248	265	275	283	288								
DIFF	- 1	- 13	- 22	- 15	- 5	8	10								
%	0	- 5	- 8	- 5	- 2	3	4								

AX

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	8357	8525	8630	8595	8706	8720	8698	8640	8622	8523	8472	8357	8238	8175	8112
I	8779	9015	9330	9484	10024	10152	10278								
DIFF	422	490	700	889	1318	1432	1580								
%	5	6	8	10	15	16	18								
E-4															
R	3041	3102	3160	3159	3208	3217	3215	3197	3187	3141	3121	3060	2995	2957	2919
I	3368	3459	3624	3569	3901	3924	3924								
DIFF	327	357	464	410	693	707	709								
%	11	12	15	13	22	22	22								
E-5															
R	2548	2612	2648	2636	2669	2667	2653	2637	2633	2605	2588	2560	2530	2515	2500
I	2434	2459	2656	2785	2954	3032	3109								
DIFF	- 114	- 153	8	149	285	365	456								
%	- 4	- 6	0	6	11	14	17								
E-6															
R	1801	1817	1824	1798	1816	1819	1814	1803	1804	1791	1787	1771	1759	1756	1753
I	1897	1999	1966	2019	2041	2046	2076								
DIFF	96	182	142	221	225	227	262								
%	5	10	8	12	12	12	14								
E-7															
R	967	994	998	1002	1013	1017	1016	1003	998	986	976	966	954	947	940
I	1080	1098	1084	1111	1128	1150	1169								
DIFF	113	104	86	109	115	133	153								
%	12	10	9	11	11	13	15								
E-7 through E-9															
R	1441	1466	1479	1487	1503	1508	1509	1467	1492	1469	1467	1449	1430	1420	1410
I	1494	1533	1528	1555	1578	1608	1634								
DIFF	53	67	49	68	75	100	125								
%	4	5	3	5	5	7	8								

BM

BOATSWAIN'S MATE

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2353	2406	2437	2463	2466	2469	2471	2473	2475	2475	2475	2471	2469	2465	2460
I	2051	2102	2182	2239	2290	2356	2387								
DIFF	- 302	- 304	- 255	- 224	- 176	- 113	- 84								
%	- 13	- 13	- 10	- 9	- 7	- 5	- 3								
E-4															
R	850	856	861	862	862	862	861	861	862	862	862	861	861	861	860
I	772	739	770	744	731	768	765								
DIFF	- 78	- 117	- 91	- 118	- 131	- 94	- 96								
%	- 9	- 14	- 11	- 14	- 15	- 11	- 11								
E-5															
R	857	900	919	940	904	940	939	939	939	940	940	940	939	937	935
I	712	746	795	861	913	937	961								
DIFF	- 145	- 154	- 124	- 79	- 27	- 3	72								
%	- 17	- 17	- 13	- 8	- 3	0	2								
E-6															
R	471	475	483	486	489	492	496	498	499	498	498	495	494	492	490
I	411	452	453	468	478	479	486								
DIFF	- 60	- 23	- 30	- 18	- 11	- 13	- 10								
%	- 13	- 5	- 6	- 4	- 2	- 3	- 2								
E-7															
R	175	175	174	175	175	175	175	175	175	175	175	175	175	175	175
I	156	165	164	166	168	172	175								
DIFF	- 19	- 10	- 10	- 9	- 7	- 3	0								
%	- 11	- 6	- 6	- 5	- 4	- 2	0								
E-7 through E-9															
R	238	239	238	239	239	239	239	239	239	239	239	239	239	239	239
I	221	234	234	237	239	245	249								
DIFF	- 17	- 5	- 4	- 2	0	6	10								
%	- 7	- 2	- 2	- 1	0	3	4								

CTM

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	6897	6976	7053	7141	7158	7190	7195	7205	7225	7222	7219	7201	7190	7180	7168
I	5960	6061	6468	6877	6950	6841	7100								
DIFF	- 937	- 915	- 585	- 264	- 208	- 349	- 95								
%	- 14	- 13	- 8	- 4	- 3	- 5	- 1								
E-4															
R	1928	1955	1981	2000	2003	2013	2012	2014	2020	2019	2018	2011	2009	2006	2003
I	1778	1766	2038	2189	2028	2097	2117								
DIFF	- 150	- 189	57	189	25	84	105								
%	- 8	- 10	3	9	1	4	5								
E-5															
R	2253	2284	2327	2382	2388	2399	2401	2405	2413	2411	2409	2402	2396	2393	2390
I	1854	1891	2007	2214	2438	2245	2445								
DIFF	- 399	- 393	- 320	- 168	50	- 154	44								
%	- 18	- 17	- 14	- 7	2	- 6	2								
E-6															
R	1817	1833	1836	1845	1848	1853	1855	1857	1860	1860	1859	1855	1853	1848	1843
I	1563	1620	1630	1670	1660	1652	1676								
DIFF	- 254	- 213	- 206	- 175	- 188	- 201	- 179								
%	- 14	- 12	- 11	- 9	- 10	- 11	- 10								
E-7															
R	899	904	909	914	919	925	927	929	932	932	933	933	932	933	932
I	765	784	793	804	824	847	862								
DIFF	- 134	- 120	- 116	- 110	- 95	- 78	- 65								
%	- 15	- 13	- 13	- 12	- 10	- 8	- 7								
E-7 through E-9															
R	1242	1248	1257	1263	1268	1274	1276	1278	1281	1281	1282	1282	1281	1282	1281
I	1060	1093	1104	1118	1142	1175	1195								
DIFF	- 182	- 155	- 153	- 145	- 126	- 99	- 81								
%	- 15	- 12	- 12	- 11	- 10	- 8	- 6								

CT(x)

CRYPTOLOGIC TECHNICIAN (All nonmaintenance branches)

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	3140	3180	3180	3135	3153	3162	3162	3157	3163	3161	3159	3151	3137	3143	3134
I	2897	3080	3246	3296	3420	3458	3503								
DIFF	- 243	- 100	66	161	267	296	341								
%	- 8	- 3	2	5	8	9	11								
E-4															
R	1058	1076	1076	1059	1067	1073	1068	1067	1076	1074	1072	1065	1059	1065	1061
I	1149	1216	1258	1247	1335	1342	1342								
DIFF	91	140	182	188	268	269	274								
%	9	13	17	18	25	25	26								
E-5															
R	1010	1026	1026	1010	1016	1018	1022	1021	1019	1019	1018	1018	1013	1013	1010
I	795	869	938	975	1010	1029	1056								
DIFF	- 215	- 157	- 88	- 35	- 6	11	34								
%	- 21	- 15	- 9	- 3	- 1	1	3								
E-6															
R	711	717	717	709	712	713	713	712	712	712	713	713	711	711	710
I	645	674	726	745	744	749	760								
DIFF	- 66	- 43	9	36	32	36	47								
%	- 9	- 6	1	5	4	5	7								
E-7															
R	361	361	361	357	358	358	359	357	356	356	356	355	354	354	353
I	308	321	324	329	331	338	345								
DIFF	- 53	- 40	- 37	- 28	- 27	- 20	- 14								
%	- 15	- 11	- 10	- 8	- 8	- 6	- 4								
E-7 through E-9															
R	500	500	500	495	496	496	497	495	494	494	494	493	492	492	491
I	385	420	426	431	435	445	453								
DIFF	- 115	- 80	- 74	- 64	- 61	- 51	- 44								
%	- 23	- 16	- 15	- 13	- 12	- 10	- 9								

DP

DATA PROCESSING TECHNICIAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2942	2991	3017	3019	3077	3127	3088	3072	3108	3084	3059	3021	2995	2983	2969
I	2082	2938	3049	3171	3278	3372	3382								
DIFF	- 140	- 53	32	152	201	245	294								
%	- 5	- 2	1	5	7	8	10								
E-4															
R	957	976	984	986	1005	1014	1009	1007	1020	1016	1011	1007	1000	1001	1000
I	1038	1027	1034	1043	1102	1160	1129								
DIFF	81	51	50	57	97	146	120								
%	8	5	5	6	10	14	12								
E-5															
R	1015	1024	1025	1022	1041	1056	1028	1018	1033	1023	1013	992	981	973	965
I	1002	1095	1146	1212	1204	1201	1201								
DIFF	- 13	- 71	121	190	163	145	173								
%	- 1	- 7	12	19	16	14	17								
E-6															
R	706	719	734	738	750	766	762	757	763	754	745	734	728	725	722
I	538	577	616	654	707	639	774								
DIFF	- 168	- 142	- 118	- 84	- 43	- 27	12								
%	- 24	- 20	- 16	- 11	- 6	- 4	2								
E-7															
R	264	272	274	273	281	291	289	290	292	291	290	288	286	284	282
I	224	239	253	262	265	272	278								
DIFF	- 40	- 33	- 21	- 11	- 16	- 19	- 11								
%	- 15	- 12	- 8	- 4	- 6	- 7	- 4								
E-7 through E-9															
R	311	319	321	321	330	341	338	340	344	343	343	341	339	338	337
I	269	285	299	310	313	322	330								
DIFF	- 42	- 34	- 22	- 11	- 17	- 19	- 8								
%	- 14	- 11	- 7	- 3	- 5	- 6	- 2								

DS

DATA SYSTEMS TECHNICIAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	11135	11271	11381	11245	11418	11376	11340	11157	11137	11012	10887	10613	10403	10263	10125
I	11057	11683	11861	11978	12171	12315	12389								
DIFF	- 78	412	480	733	753	939	1049								
%	- 1	4	4	7	7	8	9								
E-4															
R	4540	4593	4640	4575	4632	4603	4565	4501	4487	4434	4381	4292	4216	4164	4113
I	5041	5520	5521	5408	5383	5328	5263								
DIFF	501	927	881	833	751	725	698								
%	11	20	19	18	16	16	15								
E-5															
R	3020	3063	3089	3056	3127	3113	3136	3102	3098	3077	3056	3011	2957	2923	2889
I	2931	2973	3033	3180	3196	3290	3373								
DIFF	- 89	- 90	- 56	124	69	177	237								
%	- 3	- 3	- 1	4	2	6	8								
E-6															
R	2538	2568	2588	2550	2590	2595	2588	2540	2539	2504	2469	2370	2314	2276	2239
I	2033	2142	2266	2331	2517	2597	2635								
DIFF	- 505	- 426	- 322	- 219	- 73	2	47								
%	- 20	- 17	- 12	- 9	- 3	0	2								
E-7															
R	1037	1047	1064	1064	1069	1067	1051	1014	1013	997	981	940	916	900	884
I	1052	1048	1041	1059	1075	1100	1118.								
DIFF	15	1	- 23	- 5	6	33	67								
%	1	0	- 2	0	1	3	6								
E-7 through E-9															
R	1608	1635	1667	1673	1705	1707	1713	1690	1692	1672	1652	1590	1548	1520	1493
I	1581	1614	1616	1640	1665	1702	1729								
DIFF	- 27	- 21	- 51	- 33	- 40	- 5	16								
%	- 2	- 1	- 3	- 2	- 2	0	1								

EM

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	17823	18098	18334	18436	18644	18742	18755	18563	18582	18345	18049	17392	16997	16740	16485
I	15414	16005	16500	17371	17832	18577	18808								
DIFF	- 2409	- 2093	- 1834	- 1065	- 812	- 165	53								
%	- 14	- 12	- 10	- 6	- 4	- 1	0								
E-4															
R	6695	6827	6977	7066	7082	7107	7060	6969	6987	6876	6765	6493	6340	6254	6169
I	5457	5711	5866	6372	6456	6998	6976								
DIFF	- 1238	- 1116	- 1111	- 694	- 626	- 109	- 84								
%	- 18	- 16	- 16	- 10	- 9	- 2	- 1								
E-5															
R	5936	6024	6102	6139	6269	6317	6370	6325	6330	6260	6191	6036	5925	5829	5734
I	5141	5334	5525	5633	5949	6075	6230								
DIFF	- 795	- 690	- 577	- 506	- 320	- 242	- 140								
%	- 13	- 11	- 9	- 8	- 5	- 4	- 2								
E-6															
R	3614	3653	3643	3613	3656	3667	3663	3628	3628	3586	3501	3338	3245	3195	3145
I	3356	3511	3633	3867	3905	3950	4021								
DIFF	- 258	- 142	- 10	254	249	283	358								
%	- 7	- 4	0	7	7	8	10								
E-7															
R	1578	1594	1612	1618	1637	1651	1662	1641	1637	1623	1592	1525	1487	1462	1437
I	1460	1449	1476	1499	1522	1554	1581								
DIFF	- 118	- 145	- 136	- 119	- 115	- 97	- 81								
%	- 7	- 9	- 8	- 7	- 7	- 6	- 5								
E-7 through E-9															
R	2103	2127	2146	2155	2182	2200	2209	2185	2183	2166	2130	2060	2017	1988	1959
I	2022	2034	2068	2101	2126	2172	2210								
DIFF	- 81	- 93	- 78	- 54	- 56	- 28	- 1								
%	- 4	- 4	- 4	- 3	- 3	- 1	0								

ET

ELECTRONICS TECHNICIAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2283	2377	2464	2524	2575	2617	2611	2590	2578	2514	2471	2414	2366	2329	2292
I	1840	1921	1994	2090	2147	2216	2215								
DIFF	- 443	- 456	- 470	- 434	- 428	- 401	- 396								
%	- 19	- 19	- 19	- 17	- 17	- 15	- 15								
E-4															
R	697	712	716	722	731	742	740	735	727	705	690	667	651	639	627
I	615	689	695	720	727	764	737								
DIFF	- 82	- 23	- 21	- 2	- 4	22	- 3								
%	- 12	- 3	- 3	0	- 1	3	0								
E-5															
R	563	623	691	743	781	801	793	790	796	777	768	754	740	730	720
I	683	666	694	726	739	734	734								
DIFF	120	43	3	- 17	- 42	- 67	- 59								
%	21	7	0	- 2	- 5	- 8	- 7								
E-6															
R	592	599	608	608	615	621	620	613	612	599	590	579	570	563	556
I	245	263	303	326	350	382	402								
DIFF	- 347	- 336	- 305	- 282	- 265	- 239	- 218								
%	- 59	- 56	- 50	- 46	- 43	- 38	- 35								
E-7															
R	431	443	449	451	448	453	458	452	443	433	423	414	405	397	389
I	297	303	302	318	331	336	342								
DIFF	- 134	- 140	- 147	- 133	- 117	- 117	- 116								
%	- 31	- 32	- 33	- 29	- 26	- 26	- 25								
E-7 through E-9															
R	504	520	525	526	523	529	532	526	517	508	498	490	481	472	463
I	365	373	371	388	401	408	415								
DIFF	- 139	- 147	- 154	- 138	- 122	- 121	- 117								
%	- 28	- 28	- 29	- 26	- 23	- 23	- 22								

EW

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	7121	7180	7273	7224	7332	7342	7380	7219	7221	7157	7093	7060	6995	6973	6951
I	6096	6511	6647	6759	7026	7119	7312								
DIFF	-1025	- 669	- 626	- 465	- 306	- 223	- 68								
%	- 14	- 9	- 9	- 6	- 4	- 3	- 1								
E-4															
R	2805	2827	2862	2830	2874	2872	2883	2809	2813	2799	2785	2776	2753	2743	2733
I	2329	2503	2520	2502	2578	2615	2725								
DIFF	- 476	- 324	- 342	- 328	- 296	- 257	- 158								
%	- 17	- 11	- 12	- 12	- 10	- 9	- 5								
E-5															
R	1937	1975	2022	2023	2072	2083	2111	2076	2077	2058	2040	2036	2020	2015	2010
I	1671	1866	1925	1970	2055	2101	2154								
DIFF	- 266	- 109	- 97	- 53	- 17	18	43								
%	- 14	- 6	- 5	- 3	- 1	1	2								
E-6															
R	1746	1736	1742	1728	1734	1733	1729	1688	1686	1663	1640	1625	1608	1602	1596
I	1453	1448	1519	1598	1699	1696	1717								
DIFF	- 293	- 288	- 223	- 130	- 35	- 37	- 12								
%	- 17	- 17	- 13	- 8	- 2	- 2	- 1								
E-7															
R	633	642	647	643	652	654	657	646	645	637	628	623	614	613	612
I	643	694	683	689	694	707	716								
DIFF	10	52	36	46	42	53	59								
%	2	8	6	7	6	8	9								
E-7 through E-9															
R	798	810	816	813	820	821	824	808	807	797	786	779	769	768	767
I	843	882	875	883	889	906	918								
DIFF	45	72	59	70	69	85	94								
%	6	9	7	9	8	10	11								

EN

ENGINEMAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	980	1016	1048	1064	1081	1105	1122	1134	1134	1096	1058	868	774	714	659
I	905	894	885	918	940	956	950								
DIFF	- 75	- 122	- 163	- 146	- 141	- 149	- 172								
%	- 8	- 12	- 16	- 14	- 13	- 13	- 15								
E-4															
R	274	280	288	288	292	296	300	304	304	292	280	217	186	166	148
I	306	301	263	272	275	276	257								
DIFF	32	21	- 25	- 16	- 17	- 20	- 43								
%	12	8	- 9	- 6	- 6	- 7	- 14								
E-5															
R	293	303	308	309	314	320	324	328	328	315	302	239	208	188	170
I	270	257	276	291	306	319	327								
DIFF	- 23	- 46	- 32	- 18	- 8	- 1	3								
%	- 8	- 15	- 10	- 6	- 3	0	1								
E-6															
R	286	304	321	336	340	351	357	359	359	350	341	306	287	277	267
I	233	243	253	262	266	266	270								
DIFF	- 53	- 61	- 68	- 74	- 74	- 85	- 87								
%	- 19	- 20	- 21	- 22	- 22	- 24	- 24								
E-7															
R	127	129	131	131	135	138	141	143	143	139	135	106	93	83	74
I	96	93	93	93	93	95	96								
DIFF	- 31	- 36	- 38	- 38	- 42	- 43	- 45								
%	- 24	- 28	- 29	- 29	- 31	- 31	- 32								
E-7 through E-9															
R	171	173	174	176	182	187	190	983	982	186	180	142	125	112	100
I	132	129	131	131	131	134	135								
DIFF	- 39	- 44	- 43	- 45	- 51	- 53	- 55								
%	- 23	- 25	- 25	- 26	- 28	- 28	- 29								

FTB

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	4600	4840	5035	5165	5276	5341	5413	5369	5326	5176	5108	4899	4765	4679	4594
I	3105	3263	3305	3457	3445	3649	3708								
DIFF	-1495	-1577	-1730	-1708	-1831	-1692	-1705								
%	-32	-33	-34	-33	-35	-32	-31								
E-4															
R	1959	2052	2145	2202	2255	2267	2295	2269	2243	2161	2120	2012	1949	1904	1860
I	1011	978	943	987	893	1006	1061								
DIFF	-948	-1074	-1202	-1215	-1362	-1261	-1234								
%	-48	-52	-56	-55	-60	-46	-54								
E-5															
R	1070	1155	1225	1266	1291	1316	1340	1338	1336	1304	1295	1247	1212	1191	1170
I	1152	1337	1389	1439	1487	1527	1512								
DIFF	82	182	164	173	196	211	172								
%	8	16	13	14	15	16	13								
E-6															
R	1036	1085	1110	1129	1149	1154	1168	1161	1150	1121	1109	1063	1033	1013	993
I	394	380	415	473	501	540	550								
DIFF	-642	-705	-695	-656	-648	-614	-618								
%	-62	-65	-63	-58	-56	-53	-53								
E-7															
R	535	548	555	568	581	604	610	601	597	590	584	577	571	571	571
I	548	568	558	558	564	576	585								
DIFF	13	20	3	10	-17	-28	-25								
%	2	4	1	-2	-3	-5	-4								
E-7 through E-9															
R	722	737	746	763	782	818	824	811	804	793	781	775	770	771	771
I	755	790	786	787	795	812	825								
DIFF	33	53	40	24	13	-6	1								
%	5	7	5	3	2	-1	0								

FTC

FIRE CONTROL TECHNICIAN (GUN FIRE CONTROL)

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	4466	4725	4946	5114	5265	5405	5471	5390	5306	5113	4989	4770	4706	4621	4537
I	3135	3287	3458	3764	3884	4127	4298								
DIFF	-1311	-1438	-1488	-1350	-1381	-1278	-1173								
%	-29	-30	-30	-26	-26	-24	-21								
E-4															
R	1787	1858	1910	1977	2035	2096	2117	2085	2039	7948	1886	1783	1751	1712	1674
I	1006	979	1113	1239	1150	1287	1406								
DIFF	-781	-879	-797	-738	-885	-809	-711								
%	-44	-47	-42	-37	-43	-39	-34								
E-5															
R	1026	1076	1133	1185	1238	1284	1315	1295	1283	1223	1191	1124	1107	1084	1061
I	1199	1305	1283	1391	1561	1646	1655								
DIFF	173	229	150	206	323	362	340								
%	17	21	13	17	26	28	26								
E-6															
R	1139	1252	1342	1381	1412	1436	1446	1415	1392	1358	1333	1293	1283	1267	1251
I	532	596	642	692	723	731	765								
DIFF	607	656	700	689	689	705	681								
%	-53	-52	-52	-50	-49	-49	-47								
E-7															
R	514	539	561	571	580	589	593	595	592	584	579	570	565	558	551
I	393	407	420	442	450	463	472								
DIFF	-116	-132	-141	-129	-130	-126	-121								
%	-23	-24	-25	-23	-22	-21	-20								
E-7 through E-9															
R	694	725	754	767	781	798	801	803	797	785	774	765	761	753	745
I	548	566	592	623	634	652	666								
DIFF	-146	-159	-162	-144	-147	-146	-135								
%	-21	-22	-21	-19	-19	-18	-17								

FTM

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	3653	3743	3806	3791	3828	3846	3833	3780	3755	3713	3669	3604	3543	3498	3453
I	3284	3435	3548	3620	3920	4044	4181								
DIFF	-369	-308	-258	-171	92	198	348								
%	-10	-8	-7	-5	2	5	9								
E-4															
R	1074	1121	1156	1156	1174	1184	1189	1186	1184	1176	1166	1148	1126	1115	1104
I	969	959	1003	991	1179	1266	1348								
DIFF	-105	-162	-153	-165	5	82	159								
%	-10	-14	-13	-14	0	7	13								
E-5															
R	1232	1257	1270	1265	1274	1279	1267	1236	1221	1200	1178	1147	1123	1101	1079
I	958	1091	1119	1165	1252	1277	1309								
DIFF	-274	-166	-151	-100	-22	2	42								
%	-22	-13	-12	-8	-2	0	3								
E-6															
R	867	881	892	879	880	879	876	863	859	852	846	838	828	821	814
I	886	899	945	973	991	992	1006								
DIFF	19	18	53	94	111	113	130								
%	2	2	6	11	13	13	15								
E-7															
R	480	484	488	491	500	504	501	495	491	485	479	471	466	461	456
I	471	486	481	491	498	509	518								
DIFF	-9	2	-7	0	-2	5	17								
%	-2	0	-1	0	0	1	3								
E-7 through E-9															
R	567	574	578	581	590	593	591	585	581	571	561	557	552	547	542
I	561	572	570	574	590	603	614								
DIFF	-6	-2	-8	-7	0	10	23								
%	-1	0	-1	-1	0	2	4								

GMG

GUNNER'S MATE (CUNS)

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1596	1651	1690	1728	1774	1820	1815	1761	1723	1659	1616	1529	1507	1474	1441
I	1078	1071	1117	1203	1210	1240	1241								
DIFF	-518	-580	-573	-525	-564	-580	-574								
%	-32	-35	-34	-30	-32	-32	-32								
E-4															
R	510	530	545	562	581	596	593	564	547	520	502	463	455	444	433
I	339	291	355	377	372	407	406								
DIFF	-171	-239	-190	-185	-209	-189	-187								
%	-34	-45	-35	-33	-36	-31	-32								
E-5															
R	469	488	502	508	518	529	518	498	481	458	441	412	404	391	378
I	393	414	387	452	470	469	481								
DIFF	-76	-74	-115	-56	-48	-60	-37								
%	-16	-15	-23	-11	-9	-11	-7								
E-6															
R	382	396	405	417	430	443	451	450	452	442	439	425	421	415	409
I	149	144	147	146	136	124	112								
DIFF	-233	-252	-258	-271	-294	-319	-339								
%	-61	-64	-64	-65	-68	-72	-75								
E-7															
R	235	237	238	241	245	252	253	249	243	239	234	229	227	224	221
I	197	222	228	228	232	240	242								
DIFF	-38	-15	-10	-13	-13	-12	-11								
%	-16	-6	-4	-5	-5	-5	-4								
E-7 through E-9															
R	280	281	282	285	289	297	298	295	288	283	277	271	269	266	263
I	235	262	270	277	275	285	287								
DIFF	-45	-19	-12	-8	-14	-12	-11								
%	-16	-7	-4	-3	-4	-4	-4								

GM4

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2165	2166	2152	2132	2125	2126	2103	2054	2035	1974	1919	1848	1806	1788	1770
I	1540	1581	1645	1692	1724	1756	1777								
DIFF	-625	-585	-507	-440	-401	-370	-326								
%	-29	-27	-24	-21	-19	-17	-16								
E-4															
R	775	778	772	762	758	758	748	724	711	692	664	635	618	608	598
I	449	469	529	556	565	579	579								
DIFF	-326	-309	-243	-206	-193	-179	-169								
%	-42	-40	-31	-27	-25	-24	-23								
E-5															
R	722	727	721	711	706	706	698	679	665	639	620	592	576	567	558
I	564	569	556	557	563	555	554								
DIFF	-158	-158	-165	-154	-143	-151	-144								
%	-22	-22	-23	-22	-20	-21	-21								
E-6															
R	471	463	461	461	462	463	457	449	457	441	434	420	412	413	414
I	343	360	374	392	408	431	450								
DIFF	-128	-103	-87	-69	-54	-32	-7								
%	-27	-22	-19	-15	-12	-7	-2								
E-7															
R	197	198	198	198	199	199	200	202	202	202	201	201	200	200	200
I	184	183	186	187	188	191	194								
DIFF	-13	-15	-12	-11	-11	-8	-6								
%	-7	-8	-6	-6	-6	-4	-3								
E-7 through E-9															
R	301	306	306	306	308	308	311	315	315	315	315	316	315	315	315
I	238	243	248	249	251	256	260								
DIFF	-63	-63	-58	-57	-57	-52	-51								
%	-21	-21	-19	-19	-19	-17	-16								

GMT

GUNNER'S MATE (TECHNICIAN)

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	748	769	798	824	855	894	943	974	987	989	993	993	993	993	993
I	557	594	666	734	766	765	740								
DIFF	-191	-175	-132	-90	-89	-129	-203								
%	-26	-23	-17	-11	-10	-14	-22								
E-4															
R	291	299	314	330	345	366	389	404	412	414	416	416	416	416	416
I	152	193	246	266	271	270	261								
DIFF	-139	-106	-68	-64	-74	-96	-128								
%	-48	-35	-22	-19	-21	-26	-33								
E-5															
R	180	189	200	204	214	223	235	242	244	244	244	244	244	244	244
I	182	179	202	255	282	286	279								
DIFF	2	-10	2	51	68	63	44								
%	1	-5	1	25	32	28	19								
E-6															
R	156	161	162	166	169	174	184	190	191	191	192	192	192	192	192
I	125	107	98	93	89	85	87								
DIFF	-31	-54	-64	-73	-80	-89	-97								
%	-20	-34	-40	-44	-47	-51	-53								
E-7															
R	121	120	122	124	127	131	135	138	140	140	141	141	141	141	141
I	98	115	120	120	124	124	113								
DIFF	-23	-5	-2	-4	-3	-7	-22								
%	-19	-4	-2	-3	-2	-5	-16								
E-7 through E-9															
R	160	158	161	163	167	172	178	182	185	186	187	187	187	187	187
I	123	145	152	155	162	165	155								
DIFF	-37	-13	-9	-8	-5	-7	-23								
%	-23	-8	-6	-5	-3	-4	-13								

GSE

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1326	1378	1434	1504	1577	1667	1771	1834	1871	1880	1889	1889	1889	1889	1889
I	1247	1412	1465	1507	1525	1506	1506								
DIFF	-79	34	31	3	-52	-161	-265								
%	-6	2	2	0	-3	-10	-15								
E-4															
R	515	537	562	597	632	678	728	760	780	786	790	790	790	790	790
I	586	666	661	658	670	658	656								
DIFF	71	129	99	61	38	-20	-72								
%	14	24	18	10	6	-3	-10								
E-5															
R	384	401	419	437	459	485	515	533	545	548	551	551	551	551	551
I	368	449	510	574	583	572	571								
DIFF	-16	48	91	137	124	87	56								
%	-4	12	22	31	27	18	11								
E-6															
R	261	269	278	289	300	313	330	340	343	343	344	344	344	344	344
I	151	147	144	132	132	137	147								
DIFF	-110	-122	-134	-157	-168	-176	-183								
%	-42	-45	-48	-54	-56	-56	-55								
E-7															
R	166	171	175	181	186	191	198	201	203	203	204	204	204	204	204
I	142	150	150	143	140	139	132								
DIFF	-24	-21	-25	-38	-46	-52	-66								
%	-14	-12	-14	-21	-25	-27	-33								
E-7 through E-9															
R	219	226	231	237	244	252	261	266	269	269	270	270	270	270	270
I	179	188	190	185	183	186	181								
DIFF	-40	-38	-41	-52	-61	-66	-80								
%	-18	-17	-18	-22	-25	-26	-31								

GSM

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	5689	5781	5866	5867	5985	6011	5972	5915	5950	5859	5768	5523	5375	5274	5174
I	4714	5169	5604	5590	5665	5937	6140								
DIFF	-975	-612	-262	-277	-320	-74	168								
%	-17	-11	-4	-5	-5	-1	3								
E-4															
R	2109	2156	2201	2209	2258	2266	2260	2253	2259	2228	2197	2130	2083	2053	2023
I	1411	1735	2096	1965	1910	2106	2228								
DIFF	-698	-421	-105	-244	-348	-160	-32								
%	-33	-20	-5	-11	-15	-7	-1								
E-5															
R	1893	1919	1946	1940	1977	1981	1949	1920	1940	1908	1877	1773	1714	1670	1627
I	1848	1878	1841	1858	1959	2013	2064								
DIFF	-45	-41	-105	-82	-18	32	115								
%	-2	-2	-5	-4	-1	2	6								
E-6															
R	1243	1250	1252	1245	1262	1269	1268	1256	1262	1238	1214	1142	1105	1078	1052
I	950	1027	1128	1210	1233	1238	1256								
DIFF	-293	-223	-124	-35	-29	-31	-12								
%	-24	-18	-10	-3	-3	-2	-1								
E-7															
R	444	456	467	473	488	495	495	486	489	485	480	478	473	473	472
I	505	529	539	557	563	580	592								
DIFF	61	73	72	84	75	85	97								
%	14	16	15	18	15	17	20								
E-7 through E-9															
R	511	523	535	541	559	566	566	557	560	556	552	552	547	547	546
I	608	626	628	643	651	670	684								
DIFF	97	103	93	102	92	104	118								
%	19	20	17	19	16	18	21								

1C

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	550	550	550	513	514	516	516	453	449	441	423	408	395	397	389
I	351	379	414	444	473	487	489								
DIFF	-199	-171	-136	-69	-41	-29	-27								
%	-36	-31	-25	-13	-8	-6	-5								
E-4															
R	158	158	158	145	146	147	147	130	129	128	121	117	113	114	112
I	100	102	125	135	143	151	150								
DIFF	-58	-56	-33	-10	-3	4	3								
%	-37	-35	-21	-7	-2	3	2								
E-5															
R	191	190	190	180	180	181	179	155	154	151	144	138	133	134	131
I	97	115	125	140	157	165	170								
DIFF	-94	-75	-65	-40	-23	-16	-9								
%	-49	-39	-34	-22	-13	-9	-5								
E-6															
R	139	139	139	131	131	131	133	122	120	117	114	110	107	107	105
I	102	106	108	113	118	115	112								
DIFF	-37	-33	-31	-18	-13	-16	-21								
%	-27	-24	-22	-14	-10	-12	-16								
E-7															
R	62	62	62	57	57	57	57	46	46	45	44	43	42	42	41
I	52	56	56	56	55	56	57								
DIFF	-10	-6	-6	-1	-2	-1	0								
%	-16	-10	-10	-2	-4	-2	0								
E-7 through E-9															
R	80	80	80	73	73	73	73	62	61	60	59	58	57	57	56
I	69	75	76	76	77	78	79								
DIFF	-11	-5	-4	3	4	5	6								
%	-14	-6	-5	4	5	7	8								

IM

INSTRUMENTMAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	21794	22073	22212	21905	22287	22293	22003	21776	21834	21421	21005	20003	19402	18962	18532
I	21493	22590	23065	23314	24147	24403	24461								
DIFF	-301	517	853	1409	1860	2110	2458								
%	-1	2	4	6	8	9	11								
E-4															
R	8788	8861	8947	8824	8948	8916	8746	8654	8675	8471	8266	7877	7650	7488	7329
I	9318	10055	10338	10208	10620	10689	10495								
DIFF	530	1194	1391	1384	1672	1773	1749								
%	6	13	16	16	19	20	20								
E-5															
R	5901	6017	6040	5943	6089	6107	6058	6011	6024	5937	5850	5559	5374	5226	5082
I	6210	6566	6704	6988	7116	7007	7029								
DIFF	309	549	664	1045	1027	900	971								
%	5	9	11	18	17	15	16								
E-6															
R	5164	5235	5264	5203	5298	5320	5263	5215	5245	5155	5064	4824	4680	4581	4484
I	4113	4122	4192	4251	4507	4775	4972								
DIFF	-1051	-1113	-1072	-952	-791	-545	-291								
%	-20	-21	-20	-18	-15	-10	-6								
E-7															
R	1941	1960	1961	1935	1952	1950	1936	1896	1890	1858	1825	1743	1698	1667	1637
I	1852	1847	1831	1867	1904	1932	1965								
DIFF	-89	-113	-130	-68	-48	-18	29								
%	-5	-6	-7	-4	-2	-1	1								
E-7 through E-9															
R	2993	3024	3033	3007	3047	3056	3036	2989	2986	2942	2896	2778	2709	2661	2614
I	2807	2844	2835	2876	2920	2966	3017								
DIFF	-186	-180	-198	-131	-127	-90	-19								
%	-6	-6	-7	-4	-4	-3	-1								

MM

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	522	524	524	524	524	524	524	524	524	524	524	524	524	524	524
I	452	486	521	521	538	540	547								
DIFF	-70	-38	-3	-3	14	16	23								
%	-13	-7	-1	-1	3	3	4								
E-4															
R	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219
I	187	220	242	233	244	242	242								
DIFF	-32	1	23	14	25	23	23								
%	-15	0	11	6	11	11	11								
E-5															
R	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147
I	121	117	129	131	136	139	143								
DIFF	-26	-30	-18	-16	-11	-8	-4								
%	-18	-20	-12	-11	-7	-5	-3								
E-6															
R	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109
I	98	104	103	106	106	106	108								
DIFF	-11	-5	-6	-3	-3	-3	-1								
%	-10	-5	-6	-3	-3	-3	-1								
E-7															
R	47	49	49	49	49	49	49	49	49	49	49	49	49	49	49
I	46	45	47	51	52	53	54								
DIFF	-1	-4	-2	2	3	4	5								
%	-9	-8	-4	4	6	8	10								
E-7 through E-9															
R	85	87	87	87	87	87	87	87	87	87	87	87	87	87	87
I	82	82	84	88	89	93	94								
DIFF	-3	-5	-3	1	2	6	7								
%	-4	-6	-3	1	2	7	8								

MN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1986	2062	2111	2142	2184	2227	2249	2277	2277	2188	2097	1657	1441	1301	1177
I	1931	1967	2003	2086	2156	2261	2329								
DIFF	-55	-95	-108	-56	-28	34	80								
%	-3	-5	-5	-3	-1	2	4								
E-4															
R	710	730	750	750	761	772	784	794	794	760	724	537	446	386	334
I	547	546	600	631	655	699	738								
DIFF	-163	-184	-150	-119	-106	-73	-46								
%	-23	-25	-20	-16	-14	-9	-6								
E-5															
R	726	763	787	807	821	837	843	852	852	816	782	600	512	452	339
I	845	870	853	890	934	987	1008								
DIFF	119	107	66	83	113	150	165								
%	16	14	8	10	14	18	20								
E-6															
R	374	390	393	403	415	429	433	441	441	429	417	378	357	347	337
I	393	403	398	413	414	416	422								
DIFF	19	13	5	10	-1	-13	-11								
%	5	3	1	2	0	-3	-3								
E-7															
R	176	179	181	182	187	189	189	190	190	183	174	142	126	116	107
I	146	148	152	152	153	159	161								
DIFF	-30	-31	-29	-30	-34	-30	-28								
%	-17	-17	-16	-16	-18	-16	-15								
E-7 through E-9															
R	237	241	243	245	252	256	255	256	256	245	233	191	170	157	145
I	204	207	208	215	220	227	227								
DIFF	-33	-34	-35	-30	-32	-29	-28								
%	-14	-14	-14	-12	-13	-11	-11								

MT

MISSILE TECHNICIAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	373	373	373	346	346	346	346	298	288	279	270	261	252	252	248
I	233	267	321	353	372	388	404								
DIFF	-140	-106	-52	7	26	42	58								
%	-38	-28	-14	2	8	12	17								
E-4															
R	112	112	112	102	102	102	102	87	83	80	77	74	71	71	70
I	52	78	115	117	110	120	120								
DIFF	-60	-34	3	15	8	18	18								
%	-54	-30	3	15	8	18	18								
E-5															
R	123	123	123	114	114	114	114	94	91	88	85	82	79	79	78
I	56	67	86	114	136	133	139								
DIFF	-67	-56	-37	0	22	19	25								
%	-54	-46	-30	0	19	17	22								
E-6															
R	90	90	90	83	83	83	83	73	71	69	67	65	63	63	62
I	87	80	78	80	84	92	102								
DIFF	-3	-10	-12	-3	1	9	19								
%	-3	-11	-13	-4	1	11	23								
E-7															
R	48	48	48	47	47	47	47	44	43	42	41	40	39	39	38
I	38	42	42	42	42	43	43								
DIFF	-10	-6	-6	-5	-5	-4	-4								
%	-21	-12	-12	-11	-11	-9	-9								
E-7 through E-9															
R	60	60	60	58	58	58	58	53	52	51	50	49	48	48	47
I	49	54	54	54	55	55	55								
DIFF	-11	-6	-6	-4	-3	-3	-3								
%	-18	-10	-10	-7	-5	-5	-5								

OM

OPTICALMAN

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	7909	8168	8282	8346	8499	8608	8582	8487	8478	8244	8131	7884	7722	7593	7465
I	5332	6284	6826	7167	6973	6765	6745								
DIFF	-2577	-1884	-1456	-1179	-1526	-1843	-1837								
%	-33	-23	-18	-14	-18	-21	-21								
E-4															
R	3172	3277	3279	3249	3268	3296	3266	3217	3222	3098	3043	2910	2831	2770	2710
I	1825	2511	2540	2479	2145	2049	2117								
DIFF	-1347	-766	-739	-770	-1123	-1247	-1149								
%	-42	-23	-23	-24	-34	-38	-35								
E-5															
R	2451	2526	2585	2619	2691	2731	2689	2641	2626	2545	2499	2417	2366	2319	2273
I	1906	2104	2568	2953	3007	2831	2698								
DIFF	-545	-422	-17	334	316	100	9								
%	-22	-17	-1	13	12	4	0								
E-6															
R	1644	1719	1768	1822	1872	1906	1943	1935	1931	1902	1888	1857	1826	1804	1782
I	1049	1109	1140	1143	1221	1267	1302								
DIFF	-595	-610	-628	-679	-651	-639	-641								
%	-36	-35	-36	-37	-35	-34	-33								
E-7															
R	642	646	650	656	668	675	684	694	699	699	701	700	699	700	700
I	552	560	578	592	600	618	628								
DIFF	-90	-86	-72	-64	-68	-57	-56								
%	-14	-13	-11	-10	-10	-8	-8								
E-7 through E-9															
R	948	955	962	970	986	998	1006	1011	1012	999	999	990	981	974	974
I	827	848	870	887	900	924	939								
DIFF	-121	-107	-92	-83	-86	-74	-67								
%	-13	-11	-10	-9	-9	-7	-7								

OS

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	1508	1517	1517	1578	1578	1578	1578	1578	1578	1574	1570	1562	1546	1546	1546
I	1117	1149	1221	1289	1291	1287	1291								
DIFF	-391	-368	-296	-289	-287	-291	-287								
%	-26	-24	-20	-18	-18	-18	-18								
E-4															
R	418	419	419	419	419	419	419	419	419	419	416	413	407	407	407
I	260	288	318	301	272	260	272								
DIFF	-158	-131	-101	-118	-147	-159	-147								
%	-38	-31	-24	-28	-35	-38	-35								
E-5															
R	529	530	530	564	564	564	564	564	564	563	563	563	561	561	561
I	362	353	375	444	458	442	416								
DIFF	-167	-177	-155	-120	-106	-122	-148								
%	-32	-33	-29	-21	-19	-22	-26								
E-6															
R	415	415	415	441	441	441	441	441	441	438	438	434	428	428	428
I	377	386	395	397	412	431	446								
DIFF	-38	-29	-20	-44	-29	-10	5								
%	-9	-7	-5	-10	-7	-2	1								
E-7															
R	146	153	153	154	154	154	154	154	154	154	153	152	150	150	150
I	118	122	133	147	149	154	157								
DIFF	-128	-31	-20	-7	-5	0	3								
%	-19	-20	-13	-5	-3	0	2								
E-7 through E-9															
R	197	204	204	205	205	205	205	205	205	205	204	203	201	201	201
I	169	174	185	202	204	211	215								
DIFF	-28	-30	-19	-3	-1	6	10								
%	-14	-15	-9	-1	0	3	5								

OT

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	15620	15723	15831	15846	15952	15999	15965	15889	15914	15760	15604	15320	15041	14910	14729
I	12379	12786	13408	14112	14436	14703	14893								
DIFF	-3241	-2937	-2423	-1734	-1516	-1296	-1072								
%	-21	-19	-15	-11	-10	-8	-7								
E-4															
R	6063	6090	6139	6159	6217	6241	6216	6180	6199	6128	6057	5903	5806	5749	5692
I	4292	4429	4868	5294	5322	5440	5439								
DIFF	-1771	-1661	-1271	-865	-895	-801	-777								
%	-29	-27	-21	-14	-14	-13	-12								
E-5															
R	5163	5219	5250	5248	5274	5282	5277	5258	5267	5225	5182	5089	5031	4997	4963
I	3899	4007	4273	4465	4731	4840	4963								
DIFF	-1264	-1212	-977	-783	-543	-442	-314								
%	-24	-23	-19	-15	-10	-8	-6								
E-6															
R	2913	2923	2943	2944	2963	2977	2966	2946	2946	2919	2892	2892	2789	2766	2743
I	2846	2996	2930	3002	3018	3028	2072								
DIFF	-67	73	-13	58	55	51	106								
%	-2	2	0	2	2	2	4								
E-7															
R	1481	1491	1499	1495	1498	1499	1506	1505	1502	1488	1473	1436	1415	1398	1381
I	1342	1354	1337	1351	1365	1395	1419								
DIFF	-139	-137	-162	-144	-133	-104	-87								
%	-9	-9	-11	-10	-9	-7	-6								
E-7 through E-9															
R	1949	1967	1976	1973	1982	1985	1991	1988	1985	1965	1953	1914	1889	1869	1849
I	1791	1819	1811	1836	1853	1893	1925								
DIFF	-158	-148	-165	137	129	-92	-66								
%	-8	-8	-8	-7	-7	-5	-3								

RM

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	2769	2815	2852	2869	2876	2894	2898	2873	2873	2791	2737	2368	2207	2077	1956
I	2696	2760	2794	2850	2910	3012	3069								
DIFF	-73	-55	-58	-19	34	118	171								
%	-3	-2	-2	-1	1	4	6								
E-4															
R	1154	1173	1188	1193	1192	1194	1192	1183	1183	1146	1110	884	786	706	634
I	1192	1115	1097	1107	1107	1180	1201								
DIFF	38	-58	-91	-86	-85	-14	9								
%	3	-5	-8	-7	-7	-1	1								
E-5															
R	738	754	769	776	778	783	782	774	774	756	738	653	616	586	557
I	689	797	805	798	813	835	855								
DIFF	-49	43	36	22	35	52	73								
%	-7	6	5	3	4	7	9								
E-6															
R	683	695	701	706	711	720	725	719	719	695	695	638	613	593	574
I	548	568	615	664	708	711	721								
DIFF	-135	-127	-86	-42	-3	9	4								
%	-20	18	-12	-6	0	1	1								
E-7															
R	194	193	194	194	195	197	199	197	197	194	194	193	192	192	191
I	267	280	277	281	282	286	292								
DIFF	73	87	83	87	87	89	93								
%	38	45	43	45	45	45	47								
E-7 through E-9															
R	448	455	458	461	461	469	470	467	468	461	454	424	411	401	391
I	422	447	448	454	458	465	474								
DIFF	-26	-8	-10	-7	-3	-4	-4								
%	-6	-2	-2	-2	-1	-1	-1								

STS

SONAR TECHNICIAN (SUBMARINE)

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	4020	4100	4271	4337	4386	4430	4395	4311	4260	4154	4076	3967	3893	3823	3754
I	3696	3673	3781	3895	3957	4075	4088								
DIFF	-324	-427	-490	-442	-429	-355	-307								
%	- 8	- 10	- 11	-10	- 10	- 8	- 7								
E-4															
R	1379	1386	1407	1424	1451	1473	1465	1438	1419	1378	1350	1304	1277	1253	1229
I	1300	1088	1212	1277	1234	1257	1263								
DIFF	- 79	-298	-195	-147	-217	-216	-202								
%	- 6	- 22	- 14	- 10	- 15	- 15	- 14								
E-5															
R	1269	1310	1372	1388	1376	1380	1374	1348	1331	1296	1267	1236	1210	1185	1161
I	1468	1621	1540	1554	1659	1730	1722								
DIFF	199	311	168	166	283	350	348								
%	16	24	12	12	21	25	25								
E-6															
R	1072	1104	1182	1208	1233	1248	1231	1206	1195	1172	1155	1132	1113	1095	1077
I	601	625	687	718	707	725	733								
DIFF	-471	-475	-495	-490	-526	-523	-498								
%	- 44	- 43	- 42	- 41	- 43	- 42	- 40								
E-7															
R	300	300	310	317	326	329	325	319	315	308	304	295	293	290	287
I	327	339	342	346	357	363	370								
DIFF	27	39	32	29	31	34	45								
%	5	13	10	9	10	10	14								
E-7 through E-9															
R	461	463	478	483	494	498	494	489	483	475	469	459	453	448	443
I	466	481	485	493	507	517	525								
DIFF	5	16	7	10	13	19	31								
%	1	4	1	2	3	4	6								

Table C-1 (Continued)

ITEM	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
E-4 through E-7															
R	3955	4001	4021	4031	4025	4024	4015	3809	3812	3666	3620	3387	3258	3189	3121
I	2920	3048	3144	3174	3101	3058	3005								
DIFF	-1035	-953	-877	-857	-924	-966	-1010								
%	-26	-24	-22	-21	-23	-24	-25								
E-4															
R	1506	1520	1528	1529	1524	1514	1508	1440	1440	1366	1348	1237	1177	1141	1106
I	932	968	1003	963	840	768	722								
DIFF	-574	-552	-525	-566	-684	-746	-786								
%	-38	-36	-34	-37	-45	-49	-52								
E-5															
R	1063	1075	1078	1076	1072	1071	1063	990	995	955	943	891	862	850	838
I	827	943	1040	1113	1135	1122	1099								
DIFF	-236	-132	-38	37	63	51	36								
%	-22	-12	-4	3	6	5	3								
E-6															
R	959	975	982	991	996	1004	1010	965	963	940	934	897	873	862	851
I	811	794	746	738	763	800	809								
DIFF	-148	-181	-236	-253	-233	-204	-201								
%	-15	-19	-24	-26	-23	-20	-20								
E-7															
R	427	431	433	435	433	435	434	414	414	405	395	362	346	336	326
I	350	343	355	360	363	368	375								
DIFF	-77	-88	-78	-75	-70	-67	-59								
%	-22	-20	-18	-17	-16	-15	-14								
E-7 through E-9															
R	609	629	648	668	669	675	675	646	646	625	625	590	573	563	553
I	514	514	539	548	550	560	570								
DIFF	-95	-115	-109	-120	-119	-115	-105								
%	-16	-18	-17	-18	-18	-17	-16								

TM

TORPEDOMAN'S MATE

APPENDIX B

DESCRIPTIVE SUMMARY OF PERSONNEL AVAILABILITY PROJECTIONS

DESCRIPTIVE SUMMARY OF PERSONNEL AVAILABILITY PROJECTIONS

This appendix provides a summary of the personnel availability projections presented in Appendix A. The 41 ratings are listed in alphabetical order by rating abbreviation. Those ratings for which significant personnel shortages are projected are preceded by an asterisk.

Requirements are given for each rating as a whole, since change patterns are clearest at that level and patterns for individual pay grades generally parallel them. Although nonaviation ratings tend to "decline" after about 1990, this should not be assumed to be a true lessening of personnel needs. Rather, the declines probably reflect the elimination of systems and their related personnel requirements from fleet inventory before their replacement systems and their related personnel needs have been defined. The general increase in requirements to about 1990 is primarily due to the buildup to a 600-ship Navy.

Inventory shortages or overages are described, in most cases, for pay grades E-4 through E-7 in terms of "slight" (0-10%), "minor" (10-20%), "moderate" (20-30%), "major" (30-40%), or "serious" (over 40%) relative to requirements. It should be recognized that these are approximations. This summary provides a quick overview of the magnitude and trends of the projected availabilities of the various kinds of skills and skill levels.

Table B-1

Summary of Personnel Availability Projections

Rating[a]	Requirements	Inventory[b]
AC (air traffic controller)	Essentially stable at approximately 2800.	• Serious shortage at E-4 level in 1982, improving to minor shortage by 1988. • Slight overage at E-5 level in 1982, increasing to major overage in 1988. • Major overage at E-6 level in 1982, increasing to serious overage in 1988. • Slight shortage at E-7 level in 1982, improving to slight overage in 1988. • Overall improvement from minor shortage to slight overage.
AD (aviation machinist's mate)	Slight variability around approximately 10000.	• Slight to minor shortages for all pay grades except E-6 in early 1980s, improving to slight shortages to minor overages by 1988. • E-6 level progresses from meeting requirements to minor overage.
AE (aviation electrician's mate)	Increase from 6850 in 1982 to about 7500 in 1986; essentially stable thereafter.	• Slight to minor shortages in 1982, improving to slight shortages to minor overages by 1988. • Slight average of E-4s in 1982 increases to minor average in 1988. • Overall generally steady improvement over time.
AG (aerographer's mate)	Slight increase from 1400 in 1982 to 1450 in 1986 and to 1480 by 1996.	• Slight to minor shortages in all pay grades (except E-4) improve to meet requirements by 1988. • Slight overage of E-4s in 1982 increases to minor overage in 1988. • Overall steady improvement from slight shortage to slight overage.
AO (aviation ordnanceman)	Increase from 5270 in 1982 to 5600 in 1987; then a fairly steady increase to about 5770 in 1996.	• Continuing slight overages at E-4 level. • Other pay grades improve from minor shortages in 1982 to only slight shortages in 1988. • Overall trend shows steady improvement from slight shortages to meeting requirements.
*AQ (aviation fire control technician)	Rapid increase from 2850 in 1982 to 2700 in 1985; then slight, steady increase to 2750 in 1996.	• Overall regular improvement from slight shortage to slight overage from 1982 to 1988 but variable within rating. • E-4s improve from slight shortage to moderate overage. • E-5s improve from slight shortage to minor overage. • E-6s remain in the high minor shortage range. • E-7s improve from minor shortage to slight shortage.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
*ASE (aviation support equipment technician (electrical))	Essentially static at about 775.	• Overall improvement from 1983 to 1988 from minor shortage to slight shortage. • Mid to high minor shortages persist at E-4, E-6, and E-7 levels. • E-5 level improves from minor shortage to slight overage.
ASM (aviation support equipment technician (mechanical))	Generally steady increase, primarily at the E-4 and E-5 levels, from 1510 in 1982 to 1580 in 1996.	• Persistent mid-minor overages at the E-4, E-8, and E-9 levels. • The E-7 level approximates meeting requirements throughout. • E-5 and E-6 levels improve from minor shortages in 1982 to meeting requirements in 1988.
AT (aviation electronics technician)	Steady increase from 9785 in 1982 to 10420 in 1996.	• Slight overage of E-4s in 1982 increases to a mid-minor overage in 1987-88. • E-5s, E-6s, and E-7s similarly improve from slight or minor shortages in 1982 to approximately meeting requirements (E-5s with a borderline minor overage) by 1988. • Overall, the rating improves from a slight shortage to a slight overage, with the suggestion that the trend will continue beyond the projected period.
*AW (aviation antisubmarine warfare operator)	Dramatic 19% increase from about 2925 in 1982 to approximately 3470 in 1987; then a slight increase to 3530 in 1996.	• Moderate shortages of E-5s during 1982-84, otherwise varying minor shortages among pay grades and years. Shortages apparently a function of rapid increases in requirements. Long-term trend seems to be toward meeting requirements, perhaps about 1992 or 1993.
AX (aviation antisubmarine warfare technician)	A 16% increase from 1840 in 1982 to 2130 in 1988; then only a slight additional increase in 2180 in 1996.	• E-4 level improves from minor shortage in 1982-3 to approximate parity with needs in 1988. • E-5 level improves from a slight shortage in 1982-4 to a borderline minor overage in 1988. • E-6 level maintains a minor shortage status, improving to a slight shortage by 1988. • E-7 level deteriorates from parity with needs in 1982 to minor shortages in 1984-5, then improves to slight shortages in 1988. • Overall, the trend is toward meeting requirements perhaps about 1990.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
BM (boatswain's mate)	Increases from 8830 in 1982 to 9210 in 1987; then decreases to 8580 in 1996.	• Although variable among years and pay grades, general overall trend is from slight to minor overages. • E-4s show increase from earlier minor overage to moderate overage in 1987-8. • E-5s improve from slight shortage in 1982-3 to minor overages in 1988.
*CTM (cryptologic technician (maintenance branch))	Fairly stable, regularly increasing from 2415 in 1982 to 2540 in in 1990-2, then decreasing to 2525 in 1996.	• Generally steady improvement from slight to minor shortages at the E-5, E-6, and E-7 levels in 1982 to approximate parity with needs by 1988. • The E-4 level generally remains in the mid- to low minor shortage range throughout. • Overall, trend is improvement from minor shortages to approximation of needs about 1990.
*CT(x) (cryptologic technician)[c]	Fairly stable, increasing from 7240 in 1982 to a peak of 7575 in 1990 and decreasing to 7520 in 1996.	• E-7 level improves from mid-minor shortage in 1982-85 to slight shortage in 1988. • E-6 level improves slightly from mid-minor shortage in 1982 to mid-minor shortage in 1988. • E-5 level improves from mid-minor shortage in 1982-84 to approximate requirements in 1986-88. • E-4 level improves from slight shortage in 1982-3 to slight overage thereafter. • Total overall trend is from minor shortage to about parity with requirements by 1988.
DP (data processing technician)	Very static, rising only 20 from 3280 in 1982 to a high of 3300 for 1987-92; then decreasing only 30 to 3270 in 1996.	• Overall, the rating is well manned, improving steadily from borderline minor shortage in 1982 to borderline minor overage in 1988. • E-4s increase from slight overage in 1982 to mid-moderate overage in 1988. • E-5s improve from moderate shortage in 1982 to approximate needs by 1986 and improve to slight overage in 1988. • E-6s improve steadily from slight shortage to slight overage. • E-7s improve regularly from minor shortage in 1982 to slight shortage in 1988. • Moderate shortages at the E-7/9 levels improve from moderate shortage to borderline minor-slight shortage in 1988.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

[c]Includes CTA, CTI, CTO, CTR, and CTT ratings.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
DS (data systems technician)	Fairly steady increase from 2990 in 1982 to highs of 3180 and 3160 in 1987 and 1990, respectively; then decline to 3025 in 1996.	• Overall, rating is fairly well manned. • Shortages exist at E-6 levels and above for most of the projection period. • E-7 minor shortage improves to slight shortage by 1988. • E-6 moderate shortage improves to parity with needs in 1988. • E-5s improve from slight shortage in 1982-3 to minor overage in 1988. • Slight overage of E-4s increases to minor overage in 1987-8.
EM (electrician's (mate)	One of the larger ratings. Increases slightly from 11700 in 1982 to about 12000 in 1986-8; then declines gradually to 10700 in 1996.	• Generally keeps pace with requirements. • Minor shortage at E-6 level in 1982-4 improves to meet needs by 1987-8. • Variable minor overage at E-4 level throughout projection period.
EN (engineman)	Steady increase from 7300 in 1982 to 7550 in 1988; then decline to 7100 in 1996.	• Minor shortages at E-4, E-5, and E-6 levels in 1982 improve to approximate requirements by 1987-8. • Slight and increasing overages in top three pay grades from 1982-8.
ET (electronics technician)	One of the largest ratings. Increases from 18350 in 1982 to a high of 19300 in 1987-8; then declines to 17000 in 1996.	• Overall slight to minor shortages in all pay grades in 1982 improve to approximate requirements in 1988. • E-6 level improves from slight shortage in 1982 to borderline minor overage in 1988.
*EW (electronics (warfare technician)	Steady increase from 2350 in 1982 to 2700 peak in 1987; then decline to 2370 in 1996.	• Overall, minor shortages throughout projection period. • Minor shortage at E-4 level in 1982 improves to approximate requirements thereafter. • Minor overage at E-5 level deteriorates to slight shortage by 1987-8. • Serious shortage at E-6 level in 1982 improves only to moderate shortage by 1988. • In general, rating fairly well manned at lower skill levels but significantly undermanned at high skill levels, with no obvious improvement over time.
*FTB (fire control technician (ballistic missile fire control))	Regular increase from 1025 in 1982 to high of 1185 in 1989-90; then decline to 658 in 1996.	• Overall, variable minor shortages in all years except 1982. • Moderate shortages at E-6/7 levels tend to deteriorate, with E-7 becoming a major shortage in 1986 and after. (Continued on next page.)

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
*FTB (Continued)		• A minor overage at the E-4 level in 1982 deteriorates to a minor shortage by 1988. • The E-5 level only shows improvement from a minor shortage in 1983 to approximate needs in 1986-8, but improvement trend not supported by increasing shortages at E-4 level.
*FTG (fire control technician (gun fire control))	Early rapid increase from 4790 in 1982 tapers off to high of 5630 in 1988; then declines steadily to 4800 in 1996.	• Major shortages all years for rating as a whole. However, slight to minor overages exist at E-5 and E-7 levels while persistent serious shortages (over 50%) exist at E-4 and E-6 levels, with no significant improvement apparent.
*FTM (fire control technician (surface missile fire control))	Regular, rapid increase from 4650 in 1982 to 5680 in 1988; then decline to 4730 in 1996.	• Except at the E-5 level, a significantly undermanned rating. • The E-4 level exhibits a little improvement from a serious shortage in 1982 to a major shortage in 1987-8. • The projections show a minor overage at the E-5 level in 1982, increasing to a moderate overage in 1988. • There is a slight improvement in the serious shortage at the E-6 level (from 53% to 47%). • A persistent moderate shortage exists at the E-7 level.
GMG (gunner's mate (guns))	Increase from 3740 in 1982 to 4135 in 1987; then decline to 3540 in 1996.	• Although shortages exist at the E-4 pay grades during 1982-5, all levels show slight to minor overages in 1988. Trend seems to be toward a slight excess of personnel over requirements.
*GMM (gunner's mate (missiles))	Regular increase from 1640 in 1982 to 1860 in 1987; then decline to 1480 in 1996.	• Shortages all years and all pay grades, with no apparent trend toward improvement. • E-4 shortages are generally in the major shortage range. • E-5s generally vary between minor and slight shortages. • E-6s exhibit serious and worsening shortages (61% deteriorating to 75%). • E-7s show persistent slight shortages from 1983 on.
*GMT (gunner's mate (technician))	Fairly steady decline from 2270 in 1982 to 2235 in 1987 to 1885 in 1996.	• Shortages all years and all pay grades but with trend toward improvement at all pay grades except E-5. • E-4s improve from serious shortage in 1985 and after. • E-5s have a persistent moderate shortage. • E-6s progress from a moderate shortage to parity with needs in 1988. • E-7s exhibit steady improvement within the slight shortage range.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
*GSE (gas turbine system technician (electrical))	Increase fairly regularly from 790 in 1982 to 1040 in 1992 and remain constant to 1996.	• Except at the E-5 level, shortages all pay grades all years. Pattern shows some improvement in mid-80s with deterioration toward late 80s. • E-4s improve from serious shortage to moderate shortage, and then deteriorate to major shortage. • E-6s deteriorate steadily from moderate shortage to serious shortage (over 50%) in 1987-8. • Minor shortage at the E-7 level improves to almost parity with requirements, then worsens to minor shortage in 1988. • Only the E-5 level breaks the pattern, progressing erratically from equaling needs to a minor overage in 1988.
*GSM (gas turbine system technician (mechanical))	Steady increase from 1380 in 1982 to stabilize at 1955 in 1992.	• Generally consistent deterioration from 1983 on. • Overall, parity with requirements progresses to minor shortages in 1988. • E-4 level deteriorates from moderate overage to minor shortage. • E-5 level improves from minor overage to major overage but worsens to minor overage again by 1988. • E-6 level worsens within serious shortage range (from 45% to 55%). • E-7 level progresses steadily from minor shortage to major shortage. • Trend appears unlikely to be reversed significantly until well into the 1990s.
IC (interior communications electrician)	Slight, regular increase from 5750 in 1982 to 6080 in 1987, followed by fairly steady decline to 5250 in 1996.	• General improvement over projection period from minor shortage to slight overage. • E-4s improve from major shortage to approximate parity with needs in 1988. • E-5s progress from slight shortage to slight overage. • E-6s improve from moderate shortage to parity with requirements. • E-7s increase from a mid-minor overage to borderline moderate overage.
IM (instrumentman)	Total rating drops from 570 in 1982-4 to 520 in 1985-8; then declines steadily to 400 in 1996.	• Varying increase in population against decreasing needs helps improve general rating "health" from major shortage in 1982 to slight shortage in 1988. • E-4 level improves from major shortage to slight overage. • E-5 level progresses from serious shortage to only slight shortage. • E-6 level improves from moderate shortage to minor shortage. • E-7 level advances from minor shortage to parity with requirements.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
MM (machinist's mate)	One of the largest ratings. Increases from 22840 in 1982 to 23400 in 1987; then declines steadily to 19500 in 1996.	• Overall, generally satisfies requirements, with steady improvement throughout projection period. • Slight shortages at E-7 level and moderate shortages, decreasing to slight shortages, at E-6 level are numerically, although not skill-capably, counterbalanced by a slight overage increasing to a minor overage at the E-5 level and a slight overage increasing to a minor overage at the E-4 level. Trend is toward increasingly adequate personnel to meet needs.
MN (mineman)	Data show static requirements throughout the 15-year projection period: 219 E-4s. 147 E-5s, 109 E-6s, 49 E-7s, and 38 E-8/9s.	• Increasing rating population improves rating health. • E-4 level improves from minor shortage to minor overage in 1986-88. • E-5 and E-6 levels improve from minor shortages to approximate needs by 1988. • E-7 level improves from slight shortage to slight overage.
*MT (missile technician)	Fairly steady increase from 2050 in 1982 to 2345 in 1989-90; then rapid decline to 1215 in 1996.	• Overall, generally approximates requirements but with variability among pay grades and years. • E-4 level improves steadily from moderate shortage to slight shortage. • E-5 level shows a minor overage in 1982, decreases to slight overage in 1984-5, and increases to moderate overage in 1988. • E-6 level shows a fairly steady decline from a slight overage in 1982 to a slight shortage in 1987-8. • E-7 level exhibits a rather seady mid-minor shortage.
OM (opticalman)	A small rating, declining from 385 in 1982-4 to 360 in 1985-8 to 260 in 1996.	• Generally consistent improvement throughout projection period for each pay grade. Overall, rating improves from major shortage to minor overage. • E-4s improve from serious shortage to minor overage. • E-5s improve from serious shortage to moderate overage. • E-6s improve from minor shortage to moderate overage. • E-7 moderate shortage decreases to a slight shortage. • Improvements are a function of an increase in the rating population in the face of declining requirements.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
*OS (operations specialist)	Increase from 8215 in 1982 to 8930 in 1987, decline slightly to 8900 in 1988-9, and then decline dramatically to 7740 in 1996. About half the decline is at the E-4 level and a quarter each at the E-5 and E-6 levels. The top three pay grade requirements hold fairly steady.	• Overall, the rating improves from major shortage to minor shortage, and then worsens to moderate shortage. • E-4 level drops from a serious shortage to a moderate shortage and then worsens to a major shortage. • E-5 level improves from a moderate shortage in 1982 to a minor overage in 1985-6 and then drops to parity with needs in 1988. • E-6 level remains in the middle of the major shortage range. • E-7 level improves from minor shortage to slight shortage.
*OT (ocean systems technician)	Fairly stable, increasing from 1560 in 1982 to 1570 for 1983-4 to 1630 for the period 1985-90; then declining to 1600 in 1996.	• Overall, moderate shortages improve to minor shortages, with deficiencies being primarily at the E-4 and E-5 levels. • Major shortages at the E-4 level in 1982-3 improve to moderate shortages in 1984-5, and then become major shortages again in 1986-8. • Major shortages at the E-5 level in 1982-3 drop to borderline moderate shortages in 1986, and then rise to a mid-moderate shortage in 1988. • E-6s improve unsteadily from slight shortages to approximate needs in 1987-8. • Borderline moderate shortages in 1982-3 at the E-7 level improve rapidly to satisfy requirements during 1986-8. • No significant improvement in the health of the rating is likely because of the persistent, large shortages at the E-4 and E-5 levels.
*RM (radioman)	Regular increase from 16090 in 1982 to 16485 in 1987 with a decline thereafter to 15250 in 1996.	• Steady overall improvement from high minor shortage to slight shortage. • E-4s improve from high major shortage to low minor shortage. • E-5s improve from mid-major shortage to slight shortage. • E-6s consistently approximate requirements • E-7s approach borderline minor shortages during 1982-6, then improve to slight shortage in 1987-8. • If improvement trend continues, inventory should meet requirements about 1991-2.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

Table B-1 (Continued)

Rating[a]	Requirements	Inventory[b]
*STG (sonar technician (surface))	Rapid increase from 4180 in 1982 to 4600 in 1987; then a steady decline to 3910 in 1996.	• Overall, high slight shortages to borderline minor shortages persist largely due to continuing serious shortages at the E-6 level and to shortages increasing from slight to minor at the E-4 level. • Minor overage at the E-5 level increases to a moderate overage for 1986-8. A persistent borderline minor overage also exists at the E-7 level during 1983-8.
STS (sonar technician (submarine))	Slight increase from 3020 in 1982 to 3170 in 1988, dropping to 3060 in 1991, and then declining rapidly to 2160 in 1996.	• Generally about sufficient to meet requirements. • Minor shortages at the E-6 level in 1982-3 improve to meet needs in 1986-8. • Serious overages exist at the E-7 level from 1983 on.
*TM (torpedoman's mate)	Increase from 4140 in 1982 to 4265 in 1985-7; then begin decline to 3350 in 1996.	• Overall, moderate shortages persist, due in large part to E-4 level major shortages increasing to serious shortages (52% in 1988). • A moderate shortage at the E-5 level in 1982 improves to a slight overage for the period 1985-8. • Moderate shortages persist at the E-6 level during 1984-8. • Moderate shortages in 1982-3 at the E-7 level improve to increasingly minor shortages during 1984-8.

[a]Ratings for which significant personnel shortages are projected are preceded by an asterisk.

[b]Inventory projections extend only to the year 1988. The reasons for this are discussed in the body of the report.

APPENDIX C

LISTING OF RATINGS BY SIZE

To provide a ready comparison of "population" magnitudes, the ratings included in the projections are listed below in order of the total peak size of the projected rating requirements circa 1987-90. Numbers have been rounded to the nearest or even ten. Ratings for which significant shortages are projected are flagged by asterisks.

Table C-1

Listing of Ratings by Size

Rating Abbrev.	Rating Title	Peak Rqmts.
MM	Machinist's mate	23400
ET	Electronics technician	19300
*RM	Radioman	16480
EM	Electrician's mate	12000
AT	Aviation electronics technician	10220
AD	Aviation machinist's mate	10000
BM	Boatswain's mate	9210
*OS	Operations specialist	8930
EN	Engineman	7550
AE	Aviation electrician's mate	7500
IC	Interior communications electrician	6080
*FTM	Fire control technician (ballistic missile fire control)	5680
*FTG	Fire control technician (gun fire control)	5630
AO	Aviation ordnanceman	5600
*STG	Sonar technician (surface)	4600
*TM	Torpedoman's mate	4260
GMG	Gunner's mate (guns)	4140
*AW	Aviation antisubmarine warfare operator	3470
DP	Data processing technician	3300
DS	Data systems technician	3170
STS	Sonar technician (submarine)	3170
AC	Air traffic controller	2800
*AQ	Aviation fire control technician	2700
*EW	Electronic warfare technician	2700
*CTM	Cryptologic technician (maintenance branch)	2540
*MT	Missile technician	2340
*GMT	Gunner's mate (technician)	2240
AX	Aviation antisubmarine warfare technician	2130
*GSM	Gas turbine system technician (mechanical)	1980
*GMM	Gunner's mate (missiles)	1860
*OT	Ocean systems technician	1570
ASM	Aviation support equipment technician (mechanical)	1540
AG	Aerographer's mate	1450
*FTB	Fire control technician (ballistics missile fire control)	1180
*GSE	Gas turbine system technician (electrical)	1040
*ASE	Aviation support equipment technician (electrical)	780
MN	Mineman	560
OM	Opticalman	560
IM	Instrumentman	520
*CT(x)[a]	Cryptologic technician (all branches but maintenance)	--

Note. Ratings for which significant shortages are projected are preceded by an asterisk.

[a]Peak requirements for this "rating" not included, since it combines the five nonmaintenance branches of the CT field and is not comparable to the other ratings.

APPENDIX D

RATING/EQUIPMENT CROSS-INDICES

The cross-indices presented in this appendix are intended to provide information concerning which Navy ratings are currently associated, as operators and/or maintainers, with which types of existing equipment and systems. This information will permit the designer to determine which rating or ratings will most likely be called upon to operate and maintain a new system insofar as it is similar in use or technology to existing systems. Reference to the availability projections will identify the general likelihood that personnel of that/those rating(s) will or will not be on board to man the new system. Projected personnel shortages should encourage reconsideration of design options or alternatives to bring the new system more within the Navy's ability to man the system if it is to function as expected in the fleet. Neither the categories nor the systems included in them should be considered to be mutually exclusive. Since an equipment or type of equipment can be categorized in various ways, depending on the technology or combinations of technologies involved and/or its applications, it may appear under more than one equipment category in Table D-2, or more than once, under different guises, within a single category. This was done to simplify the task of finding an equipment of interest and its associated ratings.

Table D-1

Rating-to-Equipment Index--Overview

Rating	Electronic Sensors		Radar Systems		Acoustic Systems		Radio/Comm. Systems		Digital Data/ Computer Systems		Ord./Ord. Delivery Systems		Propulsion/ Power Systems		Electrical Equipment		Mechanical Equipment		Misc. Systems/ Equip./Devices		Included among CNO Priority 1 Billets
AC	-	O	-	O	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-	-	-
AD	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	1, 2
AE	-	-	-	-	-	-	-	-	M	-	-	-	-	-	M	-	-	-	M	O	1, 2
AG	-	-	-	-	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-	-	-
AO	M	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	1
AQ	M	-	M	-	-	-	-	-	M	-	M	-	-	-	-	-	-	-	M	O	-
ASE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	2
ASM	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	M	-	-	-	2
AT	M	O	M	O	M	-	M	-	M	-	M	-	-	-	-	-	-	-	M	O	1, 2
AW	-	O	-	O	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-
AX	M	-	M	O	M	-	M	O	M	-	-	-	-	-	-	-	-	-	M	O	-
BM	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	M	O	-	-	-
CTM	M	-	-	-	-	-	M	-	M	-	-	-	-	-	-	-	-	-	-	-	-
CT(x)[a]	-	O	-	-	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-	-	-
DP	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-	-	1
DS	-	-	-	-	-	-	-	-	M	-	-	-	-	-	M	-	M	-	-	-	1
EM	-	-	-	-	-	-	M	-	-	-	-	-	-	-	M	O	-	-	M	O	1, 2
EN	-	-	-	-	-	-	-	-	-	-	-	-	M	O	-	-	-	-	M	-	1, 2
ET	M	-	M	-	-	-	M	-	-	-	-	-	-	-	M	-	M	-	M	-	1, 2
EW	M	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	O	-
FTB	-	-	-	-	-	-	-	-	M	O	M	O	-	-	-	-	M	-	M	O	1
FTG	M	O	M	O	-	-	-	-	M	O	M	O	-	-	-	-	M	-	M	O	1
FTM	M	O	M	O	-	-	-	-	M	O	M	O	-	-	-	-	M	-	M	O	-
GMG	-	-	-	-	-	-	-	-	-	-	M	O	-	-	M	-	M	-	-	-	-
GMM	-	-	-	-	-	-	-	-	-	-	M	O	-	-	M	-	M	-	-	-	-
GMT	-	-	-	-	-	-	-	-	-	-	M	-	-	-	M	-	M	-	M	O	-
GSE	-	-	-	-	-	-	-	-	-	O	-	-	M	O	M	O	-	-	M	O	-
GSM	-	-	-	-	-	-	-	-	-	-	-	-	M	O	M	-	M	O	-	-	-
IC	-	-	-	-	-	-	M	O	-	-	-	-	M	O	M	-	M	-	M	O	1
IM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-
MM	-	-	-	-	-	-	-	-	-	-	-	-	M	O	-	-	M	O	M	O	1, 2
MN	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-
MT	-	-	-	-	-	-	-	-	-	-	M	-	-	-	M	-	M	-	M	O	1
OM	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-
OS	-	O	-	O	-	-	-	O	-	O	-	-	-	-	-	-	-	-	-	-	1
OT	M	O	-	-	M	O	M	O	-	-	-	-	-	-	-	-	-	-	-	-	-
RM	-	-	-	-	-	-	M	O	M	O	-	-	-	-	M	-	M	-	-	-	1, 2
STG	M	O	-	-	M	O	-	-	-	-	M	O	-	-	-	-	M	-	-	-	1, 2
STS	M	O	-	-	M	O	-	-	-	-	M	O	-	-	-	-	M	-	-	-	1, 2
TM	-	-	-	-	-	-	-	-	-	-	M	-	-	-	M	-	M	-	M	O	1

Notes.
1. M = Maintain, and O = Operate.
2. 1 = CNO Priority 1 sea duty billets; and 2 = CNO Priority 1 shore duty billets.

[a]Includes CTA, CTI, CTO, CTR, and CTT ratings.

Table D-2

Equipment-to-Rating Index by Equipment Category

Item	Rating		
	Maintain	Operate-Maintain	Operate
Electronic Sensors			
Radar systems	AQ, ET	AT, FTG, FTM	AC, AW (helicopter and nonacoustic)
Acoustic systems	AT, AX	STG, STS	AW (acoustic)
Low/very low frequency systems	--	AT, OT, STG, STS	OS
IFF equipment/systems	AT, ET	--	AC, AW (nonacoustic), OS
Magnetic anomaly detectors	AT, AX	--	AW (helicopter)
Infrared detection systems	AQ, AX, OM	EW	--
Direction-finding systems	CTM	--	CT(x)[a]
Electronic surveillance systems	--	AT	--
ECM/ESM systems	AX	AT, EW	AW (helicopter and nonacoustic)
Special submarine ECM/ESM equipment	CTM, ET	--	CT(x)[a]
Radar Systems			
Airborne	--	AT, AX	AW (helicopter and nonacoustic)
Gun/missile control	AQ	FTM	--
Gun/missile fire control	AQ	FTG, FTM	--
Carrier/ground controlled approach	ET	--	AC
Identification friend or foe (IFF)	AT, ET	--	AC, AW (nonacoustic), OS
Forward looking	AQ	--	--
Infrared	AQ, AT	--	--
Illuminating	--	FTM	--
Navigation	AT, ET	--	--
Precision	ET	--	AC
Reconnaissance	AT	--	--
Search	AT, ET	FTG, FTM	--
Surveillance	AT	--	AC, OS
Radar consoles/displays	AQ, AT, AX	FTM	OS
Acoustic Systems			
Sonars/sonobuoys	--	STG	AW (helicopter)
Airborne sonars	AT, AX	--	AW (acoustic)
Submarine sonars	--	STS	--
Special-purpose submarine sonar equipment	--	STS	--
Low/very low frequency acoustic systems	--	OT, STG, STS	--
Acoustic transponders	--	STG, STS	AW (acoustic)
Acoustic receivers	--	OT, STG, STS	AW (acoustic)
Acoustic processors	AX	OT, STG, STS	AW (acoustic)
Acoustic recorders	AX	STG, STS	AW (acoustic)
Acoustic analysis systems	AX	STG, STS	--
Acoustic data displays	AX	OT, STG, STS	--
Airborne acoustic processing equipment	AX	--	AW (helicopter)

[a]Includes CTA, CTI, CTO, CTR, and CTT ratings.

Table D-2 (Continued)

Item	Rating		
	Maintain	Operate-Maintain	Operate
Radio/Communications Systems			
Radio receivers/transmitters	ET	RM	--
Radio telephone systems	--	--	AC, BM, RM
Radio navigation systems	AT, ET	--	--
Digital/computerized communications systems	AT, CTM	RM	CT(x),[a] AW
Microwave/satellite communications systems	ET	RM	AG
Communications security devices	AT, CTM, ET, RM	--	CT(x)[a]
Cryptographic equipment	CTM, ET	RM	CT(x)[a]
Ship control communication systems	IC	--	--
Interior/interoffice communications systems	--	IC	--
Communications equipment:			
Digital data receiving systems	AT, ET	OT, RM	CT(x),[a] OS
Data link equipment	AT, AX	--	AW
Teletypewriters	--	--	AG, RM
Teleprinters	IC, EM	--	--
Telephones	--	IC	--
PBX/PAX exchange systems	--	IC	--
Digital Data/Computer Systems			
Data processors	DS	FTM, RM	AG, CT(x),[a] DP
Digital data link equipment	AT, AX, DS	--	--
General-purpose computers	DS	--	CT(x),[a] DP
Special-purpose computers	CTM, DS	--	CT(x),[a] DP
System-dedicated/embedded computers	AE, AQ, AT, AX, DS	FTB, FTG, FTM	AC, CT(x),[a] DP, OS
Digital communications systems	CTM	RM	CT(x)[a]
Computer terminals/peripherals	DS	RM	CT(x),[a] DP, OS
Input/output devices	DS	TD	DP, OS
Magnetic tape/disc equipment	DS	TD, RM	DP
Displays	AX, DS	FTG, RM	OS
Analog computers	AE	--	GSE
Ordnance/Ordnance Delivery Systems			
Aircraft:			
Guns/bombs/rockets	AO, AQ	--	--
Ordnance release/launcher systems	AO, AT	--	--
Ordnance handling equipment	AO	--	--
Air-launched guided missiles	AO, AQ	--	--
Weapons/missile launching/control systems	AQ	--	--
Surface ship/submarine:			
Ammunition/rockets	GMG	--	--
Underwater torpedoes	TM	--	--
ASW rockets	GMT, TM	--	--
Mines	MN	--	--
Nuclear depth bombs	TM	--	--
Nuclear weapon warheads/components	GMT	--	--
Guns/mounts/turrets/rocket launchers	--	GMG	--
Torpedo launcher systems	TM	--	--
Guided missile launcher systems	--	FTM, GMM	--
Surface missile fire control	--	FTG, FTM	--
Gun fire control systems	--	FTG	--
Underwater fire control systems	--	STG, STS	--
ASW fire control systems	--	STG	--
Point defense missile system	--	FTG, FTM	--
Fleet ballistic missile subsystems	MT	FTB	--

[a]Includes CTA, CTI, CTO, CTR, and CTT ratings.

Table D-2 (Continued)

Item	Rating		
	Maintain	Operate-Maintain	Operate
Propulsion/Power Systems			
Ship main propulsion systems:			
Steam	—	EN, MM	—
Diesel	—	EN, MM	—
Gas turbine	—	EN, GSE, GSM, MM	—
Nuclear	—	EM, EN, ET, IC, MM	—
Submarine diesel engines	—	EN, MM	—
Auxiliary engines:			
Diesel	—	EN, MM	—
Gas turbine	AD	EN, GSE, GSM	—
Mobile engines:			
Gasoline	ASM, EN	—	—
Diesel	ASM	—	—
Stationary diesel engines	EN	—	—
Ship engineering control systems	—	GSE, GSM, IC	—
Ship propulsion control consoles	EM	GSE, GSM, IC	—
Turbo-generators	—	MM	—
Electrical Equipment			
Power generation/distribution systems	AE, ASE, IC	EM, GSE	—
Plant controls/panels/switchboards	IC	EM	—
Controls of operating systems	AE, ASE, EM	—	—
Instruments/indicators/alarm devices	AE, EM, GSE, GSM, IC	—	—
Electrical components of:			
Gas turbine systems	ASE	GSE	—
Torpedoes	TM	—	—
Ordnance release/delivery systems	GMG, GMT, TM	—	—
Guided missile launchers	GMM, GMT, MT	—	—
Digital data systems	DS	—	—
Teletypewriters	RM	—	—
Lighting systems	EM	—	—
Automotive electrical systems	ASE	—	—
Cable assemblies	AE, DS, EM, ET	—	—
Electric ranges/ovens/fryers	EM	—	—
Mechanical Equipment			
Mechanical components of:			
Gas turbine systems	—	GSM	—
Torpedoes	TM	—	—
Digital data systems	DS	—	—
Ordnance release/delivery systems	GMG, GMT, MT	—	—
Guided missile launchers	GMM, GMT, MT	—	—
Teletypewriters	RM	—	—
Automotive hydraulic-pneumatic systems	ASM	—	—
Servo-synchro systems	DS, ET, FTB, FTG, FTM, GMG, GMM, IC, STG, STS	—	—
Deck equipment	—	MM	BM
Miscellaneous Systems/Equipment/Devices			
Precision timing devices	IM	—	—
Optical instruments	OM	AQ, EW, FTG, FTM, IC	—
Electro-optical systems	—	AX, FTM	EW
Laser systems	—	AQ	—
Audio/CCTV systems	IC	ET	—
Film projectors	EM	—	—
Inertial navigation systems	AE, AQ, AT, ET	—	—
Electro-mechanical compass/gyroscope systems	AE, AQ	EM, IC	—
Sophisticated test sets/test systems	—	AE, AQ, AT, AX, EM, GMT, GSE, MT	—
Special ordnance/weapon/missile test equipment	—	FTB, FTG, FTM, MT, TM	—
Deck hoists/winches/davits	—	MM	BM
Food preparation equipment	EM, MM	—	—
Refrigeration/air conditioning equipment	EN, MM	—	—

APPENDIX E

PREFERENTIAL MANNING AND PERSONNEL AVAILABILITY

PREFERENTIAL MANNING AND PERSONNEL AVAILABILITY

System designers are generally not concerned with the personnel required to operate and maintain a new system but, rather, with the development of equipment to provide a needed operational capability. However, the degree to which that system meets its engineered capabilities in the fleet, often depends, in large part, on how adequately it is manned.

There are two basic aspects to manning adequacy. The first, which is how well man can operate and maintain the equipment, is primarily a function of how well the equipment is "human engineered" to be operated and maintained by man. The second, which is the subject of this report, is the availability of qualified personnel to operate and maintain the equipment. It should be noted, however, that a well human engineered system generally will make most efficient and effective use of available human resources and facilitate its peronnel support.

Personnel Shortages

If there were no personnel shortages, all billets could be properly filled and there would be no manning problem. However, personnel shortages do exist and will continue to exist for the foreseeable future. Those shortages may be of one or both of two types: (1) quantitative, which means that there are fewer numbers of personnel than needed, and (2) qualitative, which means that there is an insufficiency (or even absence) of the kinds and levels of needed skills, knowledge, or other human characteristics (e.g., visual acuity, eye-hand coordination, etc.). The two types of shortages are obviously not mutually independent. Although quantitative shortages practically guarantee qualitative shortages somewhere along the line, quantitative sufficiencies, or even surpluses, do not necessarily assure qualitative sufficiencies. It may be relatively easy to obtain sufficient personnel but relatively difficult to obtain sufficient personnel with the needed basic capability, talent, aptitude, etc. A few highly skilled individuals can sometimes "make up for" a lack of less skilled individuals; for example, a highly skilled, experienced maintenance technician might be able to do more trouble-shooting, diagnosis, and maintenance-repair than can several less able technicians. However, this situation occurs rarely; the highly skilled technician is in high demand.

Traditionally, the Navy has been fairly successful in recruiting the numbers of personnel it has needed. However, it has not been wholly successful in attracting and, especially, retaining those personnel with aptitudes for service in high technology fields beyond their initial enlistment. As a result, there have been troublesome shortages, both quantitative and qualitative.

Simply stated, because of the continuing personnel shortages, the Navy cannot man all its ships, activities, units, etc., as they "should" be. It does, however, have options as to how the shortages, the undermanning, will be managed and administered. The general policy that has been followed is that all units will be manned with their "fair share" of available personnel; the quantitative and qualitative shortages will be shared equally by all.

Priority Manning

OPNAVINST 1000.16E states that the "mission accomplishment of some activities is especially essential to national interests and these activities must be properly manned,

even when personnel shortages exist." To accomplish that objective, the instruction establishes three levels of "Priority Manning."

1. Priority 1 includes "ships and activities whose mission success is deemed vital to the highest national interests and which require some degree of priority manning for an indefinite period of time." Emphasis supplied.

2. Priority 2 includes "ships and activities whose mission success is deemed essential to the national interests and which have specific need for increased manning for a specified period of time." Emphasis supplied.

3. Priority 3 includes "ships and activities which have a specific need for increased manning above the normal manning level for specific mission accomplishment," normally for a period of a year or less.

The Chief of Naval Operations (CNO) retains sole authority to authorize and direct Priority 1 and Priority 2 manning. Authority to authorize and direct Priority 3 manning is delegated to the Commander, Naval Military Personnel Command, and the Commanders in Chief, U.S. Atlantic Fleet and U.S. Pacific Fleet, within their areas of responsibility.

OPNAVINST 1000.6E also directs that, from the total Navy assets, personnel will be distributed first to Priority 1 ships and activities, and then to Priority 2 ships and activities. When all Priority 1 and 2 requirements have been met, the remaining personnel assets are to be distributed to the above identified Commanders, as manning control authorities (MCAs), on a "fair share" basis. The MCAs are directed to satisfy their Priority 3 requirements first and then to distribute on a "fair share" basis what assets remain.

There is one further consideration in addition to Priority 3 manning requirements. Combat and combat-related ships about to deploy are given special attention, on a case-by-case basis, to ensure that they are at an acceptable level of combat readiness.

Priority Billets

The number of Priority 1 billets and the ratings associated with them, because of their nature, tend to be relatively stable over a period of time. Priority 2 billets are likely to be less stable, reflecting, in part, the changing needs of the fleet and the effectiveness of retention, recruiting, and training programs. Also, CNO carefully scrutinizes the billet justifications for Priority 2 status annually in an effort to reduce their number. Almost by definition, Priority 3 billets, related as they are to specific, short-term mission requirements, are likely to be even more variable than Priority 2 billets in terms of the numbers of billets and ratings associated with them.

Priority 1 billets are, for all practical purposes, sea duty billets, existing primarily in ships having a continuing strategic mission (e.g., a fleet ballistic missile submarine). Currently, 94 percent of all Priority 1 billets are sea billets. Four ratings--fire control technician (ballistic missile fire control) (FTB), sonar technician (submarine) (STS), electronics technician (ET), and machinist's mate (MM)--account for half of all Priority 1 sea duty billets.

Priority 2 billets are principally shore duty billets, notably in activities having recruiting and training missions (i.e., for acquiring and developing the skilled personnel needed by the fleet). Currently, 77 percent of all Priority 2 billets are shore billets. Of these, 20 percent call for personnel in the FTB, STS, ET, and MM ratings. It should be emphasized, however, that every Navy rating is represented among Priority 2 shore billets; only four ratings--molder (ML), musician (MU), opticalman (OM), and patternmaker (PM)--are not included in Priority 2 sea billets.

Table E-1 shows, as of March 1982, the numbers of authorized CNO Priority 1 and 2 billets for the ratings included in this effort. The figures show which ratings are most frequently associated with priority billets and the numbers of rated personnel (i.e., E-4 and above) assignable to those billets.

Priority Perspective

To place priority manning in perspective, it should be noted that only 11 percent of all authorized Navy enlisted billets are currently designated as Priority 1 (3 percent) or Priority 2 (8 percent). Put another way, CNO Priority 1 and 2 billets account for about 9 percent of all sea duty billets and 19 percent of all shore duty billets. The percentages, however, vary considerably for individual ratings.

As might be expected, those ratings most involved in strategic missions and those most likely to be affected by sophisticated technology are also the most affected by priority manning considerations. Of course, the size of the rating (i.e., the numbers of personnel in the rating) also affects the relative impact. For example, of the almost 700 FTB billets, about 85 percent are Priority 1 (all sea) or Priority 2 (all but 2 shore), which indicates the operational importance of the rating and of supplying personnel to satisfy its operational requirements. There are similar numerical priority billet requirements and Priority 1-2 sea-shore relationships for the torpedoman's mate (TM) rating, but these account for only about 15 percent of all the more numerous TM billets. For the ET rating, the priority billets follow about the same Priority 1-2 sea-shore pattern as the FTB and TM ratings, and total more than all authorized TM billets; yet they account for less than one fourth of all ET billets. Indeed, the ET Priority 1 billets alone (almost exclusively sea) are almost as numerous (over 85 percent) as the total of all ocean systems technician (OT) billets. Priority billets for the OT rating, in turn, are all Priority 2, predominately shore, and account for only 5 percent of OT billets. The cryptologic technician (CT) rating has about the same percentage (8 percent) of priority billets (all Priority 2 and predominately shore) as the OT rating; yet this percentage numerically includes more billets than all for the FTB rating. From these examples, it should be clear that simple total numbers alone or percentages alone can be misleading.

From the system designer's point of view, priority manning considerations, as such, appear to have little potential impact on personnel availability to support new systems. If a system is associated with a strategic mission, it is likely that it will be well manned if personnel are at all available. It will be manned either by personnel from a rating more or less "dedicated" to strategic operations (e.g., FTB) or by personnel from a large rating (e.g., ET) for which the priority billets are a relatively minor percentage of the total for the rating. A system that is not associated with a strategic mission will be manned like any other on an essentially "fair share" basis. The availability projections will indicate the likelihood of adequate manning for such systems.

Enlisted Classifications

To this point, personnel availability has been considered only in terms of numbers of personnel in various ratings (occupational specialty areas) at various pay grades (skill levels). Although rating and pay grade are sometimes sufficient to define billet requirements and matching personnel capabilities, often more specific, detailed requirements-capabilities identification is needed. This specificity is provided by a system of approximately 1,000 Navy enlisted classification codes (NECs). These NECs permit the identification of special qualifications needed by personnel to operate and/or maintain equipment associated with a specific billet. They permit "fine tuning" the billet requirements-personnel capabilities identification, even to a specific modification (Mod) of a specific version (MK) of a system. This potential for "fine tuning" personnel assignments should help ensure that systems are properly manned. Personnel detailers will give first assignment priority to personnel holding appropriate NECs to billets calling for those NECs. However, if there are not sufficient NEC-qualified personnel available to satisfy billet requirements at the time of detailing, a detailer must either assign personnel possessing only approximate qualifications or leave the billet vacant until qualified personnel become available (he often is not given the second option). Either alternative, however, results in the billet and equipment being improperly or inadequately manned.

The simpler and more "generic" a system's requirements are, the easier it will be to find personnel to satisfy them because relatively more personnel who possess the required capabilities will be available. The more unique and critical a system's requirements, the greater the number of separate NECs assignable within a rating, and the smaller the size of the rating, the more difficult it will be to match a person to a billet at any one time. This suggests that, to maximize the probability that a system will be adequately manned in the fleet, it should be designed to require the lowest possible levels of skill, knowledge, and experience. However, such an orientation, if carried to the absurd, would regress the Navy to a level of "rocks and rowboats." Reality requires that advanced, sophisticated science and technology be exploited, even if that exploitation results in unavoidable (the key word) requirements for highly skilled personnel with very specialized training and experience. However, since such systems still must compete with other systems, both those existing or under development, for whatever personnel resources are available, they need to be designed for the lowest feasible personnel capability levels to optimize the likelihood of their being properly manned.

Availability Consumption

Personnel availability has so far been treated as if it were a more or less immutable "given," subject primarily to the Navy's ability to recruit and retain appropriate numbers of personnel. System designers, however, can have a significant effect on the functional availability of personnel for their system.

It was noted earlier that the majority of Priority 2 billets are shore duty billets, primarily those in recruiting and training. Clearly, the recruiting effort is essential to acquire personnel with needed basic capabilities; and the training effort, to convert those capacities into effective capabilities. Recruiting and training can therefore be looked upon as creators of needed personnel availabilities. However, training, especially, can also be a consumer of otherwise available personnel. Actually, it is not the training itself that does the consuming but the systems that generate the requirements for training.

A large part of the training effort is devoted to initial military training of recruits and to providing "Class A" technical training for entry into a rating. However, a very

large part of the training effort (and resources) is devoted to providing specialized "Class C" training of more experienced personnel to operate and/or maintain specific systems. The greater the numbers of personnel who must be trained and the more extensive the training required, the greater the number of students--and instructors--who will be unavailable to the operational fleet for the longer periods of time. Special training for new systems obviously cannot be avoided, since the extent of such training is a function of system design. However, the efficiency of training will in large part be a function of timing.

Experienced engineers are very familiar with "short fuse" demands for a product to be ready "by yesterday" and with the added expense in effort, manpower, resources, etc., that such demands impose. They are also well aware of the increased likelihood of mistakes under such conditions and the wastage incurred in undoing, redoing, and correcting those mistakes. They are familiar with the dislocations such pressures produce in other areas of their operations. The same conditions and results are created by "needed by yesterday" demands for a personnel "product."

Ideally, just enough appropriately trained personnel needed to man new equipment should arrive on board just when, or a little before, the new equipment is installed. Since large numbers of a new system rarely appear in the fleet at the same time, it should be possible to phase personnel through the training pipeline to coincide with the phased equipment installation schedule. This would minimize the number of personnel who would have to be taken from other duties at any one time. There have been instances, however, where systems have reached the fleet with little advance warning to the personnel and training communities, thereby placing them in a crisis situation to catch up with system personnel needs.

With sufficient advance warning, the personnel and training communities will generally be able to schedule "metered" training with less dislocation and disruption in both the operational and training communities and thus keep more personnel effectively available for operational requirements. In addition, the training establishment will usually be able to accomplish better training at less cost. Perhaps more important to a system's designers, with a better personnel "product," the system will be more likely to perform to design specifications and thus develop a favorable reputation reflecting back on its designers.

Summation

Although system designers must necessarily be concerned primarily with the engineering characteristics of new systems, they must also remember that a system is not likely to perform to design specifications in the operational fleet unless it is properly and adequately manned. Persistent personnel shortages virtually assure that some systems will not be manned as their equipment and missions require. Systems and activities that are deemed more important or critical than others are given preferential manning consideration. This means that the effects of basic personnel shortages may be magnified on other systems and activities. Priority manning considerations, as such, however, do not appear to be a limiting personnel availability factor of major importance for system design. The distributional availability of personnel with highly skilled, specific capabilities (or the talent and aptitude to acquire them) is of far greater importance. The fewer personnel and the lower the skill levels needed to man a new system--and still provide the needed capability, the greater the likelihood it will be adequately manned. The functional availability of even highly skilled, highly specialized personnel can be significantly improved, however, by early identification of personnel and training requirements of new systems.

Table E-1

Number of CNO Priority Billets
(as of March 1982)

Rating	Priority 1		Priority 2	
	Sea	Shore	Sea	Shore
AC	---	---	29	132
AD	42	77	177	344
AE	21	43	155	385
AG	---	---	39	18
AO	2	---	172	224
AQ	---	---	88	250
ASE	---	1	15	7
ASM	---	3	23	17
AS (E-6 & above)	---	---	13	72
AT	61	121	331	791
AW	---	---	21	73
AX	---	---	14	182
BM	9	8	124	615
CTM	---	---	7	265
CT(x)[a]	---	---	26	441
DP	2	---	28	319
DS	22	---	34	546
EM	672	4	150	795
EN	4	6	74	362
ET	1271	2	109	2255
EW	---	---	18	289
FTB	361	---	2	219
FTG	140	---	23	574
FTM	---	---	16	443
FT (E-8, E-9)	106	---	3	116
GMG	---	---	32	338
GMM	---	---	11	111
GM (E-8, E-9)	---	---	---	23
GMT	---	---	20	157
GSE	---	---	1	106
GSM	---	---	1	138
GS (E-8, E-9)	---	---	---	15
IC	485	---	74	448
IM	---	---	3	60
MM	1712	1	265	1856
MN	---	---	1	42
MT	816	---	25	424
OM	---	---	---	59
OS	4	---	114	671
OT	---	---	1	68
RM	494	36	111	795
STG	9	2	24	569
STS	1466	37	10	402
ST (E-9)	5	1	1	9
TM	210	---	7	297

Note. Includes data on authorized billets for ratings E-4 and above. Provided by OP-102C.

[a]Includes CTA, CTI, CTO, CTR, and CTT ratings.

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