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A critical factor to the continuing vitality of any large organization is its ability to accurately evaluate the technical and managerial abilities of all its members with the goal in mind of advancing only those individuals to positions of authority whose ability and performance are commensurate with the responsibility they must bear. While the Navy's selection and promotion system is generally held to be equal or superior to most others, shortcomings in the design of officer fitness reports as well as the unmanageable volume of data which selection boards are expected to digest suggest that today's system can be streamlined and improved. A computerized system would prove to be a valuable tool to selection boards, overcoming many of the weaknesses and inequities of the present manual system while retaining the human element in the selection process.

AUTOMATING THE NAVAL OFFICER SELECTION AND PROMOTION SYSTEM

An article

by

Captain G.H. Lewis, U.S. Navy

I

Introduction. The selection and promotion system for officers in the U.S. Navy has followed an oscillating course for the past two generations. Though this system has been oriented toward a single goal, the promotion of the best fitted or most qualified officers, its environment and its inherent weaknesses have caused it to vacillate sufficiently to cast some doubt on the system's ability to achieve this goal in all cases. However, a cursory review of the promotion systems used by some of the other services in the Department of Defense, together with other governmental agencies, reveals that the Navy system is equal to or superior to the others. The military facet of the Depart-

ment of Defense has, in fact, one of the better systems for promotion from within individual organizations. Having served as president of a selection board, Vice Adm. Fitzhugh Lee remarked in an analysis of the system:

I am personally convinced, after looking at the promotion systems of many civilian organizations, of foreign navies, and of our own services in the Department of Defense, that none has a better selection system than the one we have evolved. Ours is far from perfect; however, we can indeed be thankful that our selection system is completely free from such things as nepotism, marrying the boss' daughter, owning stock in the company, and having the

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top jobs nabbed by superior talents hired away from another company. All these things occur in the selection systems which affect most of our fellow Americans.¹

Nevertheless, because of human frailties in the Navy system, there are injustices. Miscomprehension and misinterpretation of various elements of the system have been instrumental in the loss of some of the best fitted officers. These injustices can be laid to the judge and the jury and not to the individual officer being considered for selection and promotion. The admiral's analysis does not pinpoint where the system is "far from perfect"; however, these imperfections will be readily apparent in a subsequent discussion of the current system.

Report of Fitness. The primary record used by the selection boards has been the report of fitness, the format of which has undergone continuing change throughout the years. The four major grading areas on the report of fitness are Section 15, Performance of Duty; Section 16, Desirability; Section 18, Overall Evaluation; and Section 20, Personal Characteristics. The additional comment area is included to expand on any strengths or weaknesses of the officer. The remainder of the report is oriented toward administrative information such as duties assigned, the employment of the command during the reporting period, and recommendations for future assignments.

It is on this record that the selection board concentrates its attention. It must examine each report of fitness in detail for each officer under consideration. This information must be digested and compared with all other officers under consideration, a process which entails dealing with voluminous data. For example, the average number of reports of fitness for an officer with 12 years' active-duty service can approach 24. At

this point in a naval officer's career, the attrition rate approximates 25 percent, and many of those attrited will have to terminate their careers on a subsequent passover by a selection board. The selection board attempts to measure each officer's record, using the same yardstick in order to determine the relative standing of those under consideration, and thus ascertain those best fitted for selection. This is a difficult task in view of the data involved. Considering the selection of lieutenants to lieutenant commander, approximately 2,500 officer records may be involved, and, using an average of 24 reports of fitness for each officer, the nine-member board would have to review 60,000 fitness reports.

In earlier years the members of the various selection boards devised their individual methods of correlating the vast amount of data to arrive at a list of officers recommended for promotion. The task of many selection boards has been reduced considerably by the use of the briefing sheet illustrated in Captain Scanland's article in the June 1963 *Proceedings*.² These sheets provide a one-line summary of the marks assigned on each report of fitness received by the Bureau of Naval Personnel. The use of the briefing sheet affords the selection board better visibility of an officer's performance pattern.*

Selection board operations are like human beings—no two are alike in every respect. However, they do follow similar patterns. The majority of the members of the selection boards have never been involved in an experience similar to the operations of a selection board, and thus they rely heavily on any member who has previously served on a board

*Clerks convert the marks assigned by reporting seniors on reports of fitness to numerical marks on the briefing sheets. These sheets are available to the selection boards and the Bureau of Naval Personnel assignment officers. At the present time they cannot be reviewed by the individual officer involved.

and, to some extent, on the experience of the recorder. Captain Scanland's typical selection board operations adequately describe the routine.

Weaknesses in the Selection System. Adm. Arleigh Burke, while serving as the Chief of Naval Operations, cautioned:

Officers must have confidence in the promotion system or discipline will be jeopardized. Unless the best officers are promoted, faith of other officers and enlisted men in the integrity of the system will be shaken. It is essential that officers be promoted who will be best qualified to lead in battle. They must have other qualifications, such as good administrative and technical ability and a wide array, of knowledge also, but the rest of the Navy must have absolute confidence in those selected. Should the less qualified personnel be selected there will come a time in battle in which the Navy will fail because of its leadership. Like begets like, and inadequate personnel, once they have moved up sufficiently to be on a selection board, will themselves be apt to select other inadequate personnel.

Standards must be very high, they must be attainable, they must be equitable, they must be well-known and they must be maintained with integrity. Otherwise the officer corps will decay and decay rapidly, and there will be no effective combat Navy if this happens.³

Leading off with this word of caution, the inherent weaknesses of the selection and promotion system can be examined critically. There are two major areas to consider—the report of fitness and the selection of officers based on it. Each one has inherent weaknesses and both are interdepen-

dent. With respect to the former, the fitness report and its effects are neither well known nor understood by the majority of reporting seniors nor those judging the officers reported on. In the latter, the preponderance of data that must be carefully reviewed, weighed, and compared by a jury of nine men makes the integrity of the system suspect. Although the two areas will be discussed separately, their combined effects will be noted.

The structure and the wording used in the fitness report creates the impression that grades are based on normal distribution curves, the famous bell-shaped curve. This curve is shown in figure 1 with the grading structure of section 15 of the fitness report superimposed thereon. This is the usual view the judges perceive as they assign marks to those officers under their command.

However, the actual distribution of grades under section 15 is more akin to the curve shown in figure 2, and this is the view on which the selection board must base its deliberations. Thus, the judge may consider that his marking of the officer places him in the upper half of his contemporaries whereas, in fact, the mark assigned places the officer in the lower half. Although this may not affect the officer's selection in the early stages of his career, it can be detrimental when the attrition rate is extremely high.

Using the same curve portrayed in figure 2, figure 3 is an example of the effects of attrition through the successive officer grades. Thus, a junior officer receiving a mark in the lower half of the Excellent column can well be a borderline case when considered for selection to commander and would probably not be selected for captain.

Another weakness noted in reports of fitness has been a tendency of some judges to grade junior officers in the ensign and lieutenant (junior grade) categories in the Satisfactory and Very Good columns. This weakness can be

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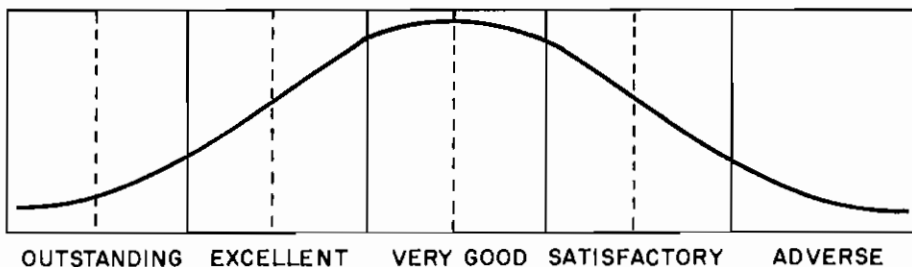


Fig. 1—Normal Distribution (Performance of Duties Superimposed)

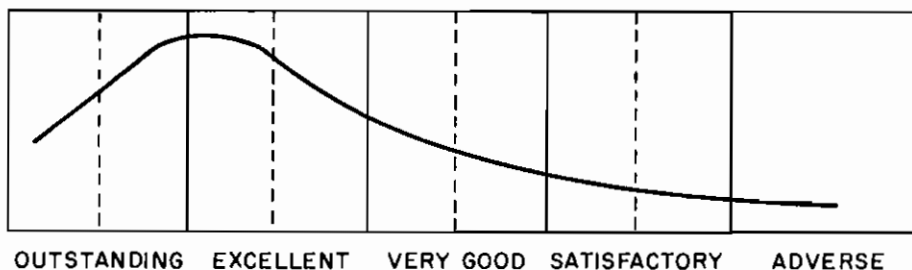


Fig. 2—Sample Distribution of Performance of Duty Marks Assigned

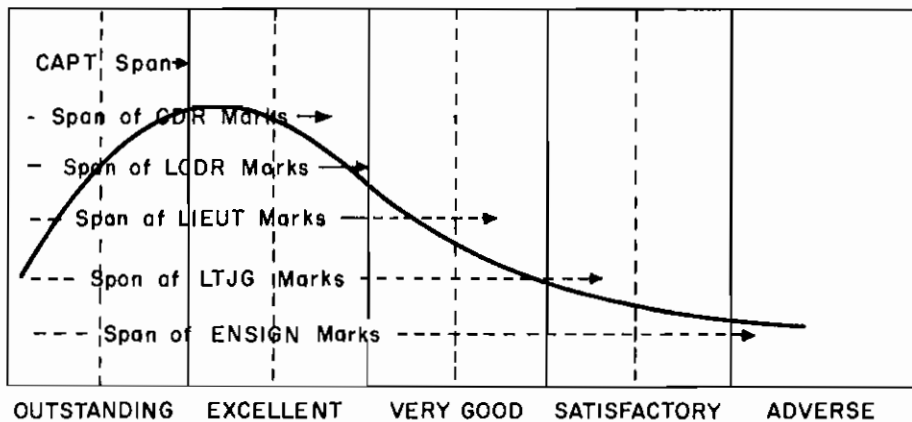


Fig. 3—Attrition Versus Distribution of Marks

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attributed to a tendency to compare junior officers with more seasoned officers despite the notation in section 13 of the report of fitness: "All evaluations made in this report shall be in comparison with other officers of the same grade, competitive category, and approximate time in grade..." The Bureau of Naval Personnel noted this weakness when they promulgated the following:

It has been noted with concern that some reporting seniors are justifying low marks on fitness reports with comments to the effect the "ENS BLANK is a fine fellow, but lacks experience. As he matures and gains experience, he will become an excellent officer." . . . In the case of newly commissioned officers, it may be entirely correct to mark an Ensign OUTSTANDING, even though he has no previous experience, and no qualifications. If he impresses the reporting senior by his demeanor and efforts as performing far above other officers with equal service, the mark is justified. The decision must rest with the reporting senior, and must be based upon his judgements and experience. In each case the officer must be compared with officers of his rank and length of service.⁴

With some judges adhering to the principles stated by the Bureau and other judges overlooking the principles, an unequitable standard is created. In those cases when selection boards consider the entire career reports of the officer under consideration, the disparity in the early marks assigned may be sufficient to select one officer and not select another.

A weakness in the report of fitness involves the words used to describe each of the marking levels. What is the numerical crossover point between good and excellent in the mind of the grader?

The wide variance between graders,

ranging from the harsh to the lenient, results in inequities when viewed realistically. The optimists of the current system believe all officers will eventually encounter an equitable number of harsh and lenient graders, and thus their selection opportunities will be based purely on their actual performance of duty. This optimism has no foundation if a careful analysis is made. These same individuals feel the lenient grader, as well as the harsh grader, will be uncovered by the nine-member jury.

The ability of the selection board to ferret out high and low graders would be questionable during their review of approximately 60,000 reports of fitness, as in the case of lieutenants to lieutenant commanders. Although briefing sheets condense the information on the 60,000 reports, there are still nine important data elements included with each reporting senior's name. Correlation of this type of information by the members of the selection board would be overwhelming.

The numerous ground rules that must be applied to all the data in each officer's record multiplies the problem confronting the selection board. Considering the number of reports involved and the four major grading areas within each report, the task of the selection board is awesome. Although it attempts to measure the performance of each officer with an identical yardstick, the board is composed of nine members with individual characteristics and weaknesses. Marks assigned to an officer serving on small craft may not be weighed as heavily by one reviewer as marks assigned for aircraft carrier duty. Other reviewers may hold the opposite philosophy, and as ground rules are not set forth for each case, there can be individual grading standards used within the selection board.

A related weakness within the selection board is the varying weight of each individual mark assigned to an officer under consideration. An attempt is

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made to adjust the weight of each mark by the period of time the mark covered—1 year, 6 months, or 4 weeks. In addition, an attempt is made to adjust marks for the primary duty the officer filled during the time frame of the report and the employment of the officer's command. For example, an excellent mark for an officer serving as ship's librarian while the ship is employed in local homeport exercises may not deserve the same weight as an excellent mark for an officer serving as gunnery officer while the ship is employed in wartime operations. The application of these varying weights uniformly by the selection board throughout all the records being reviewed defies acceptance.

Summary. The volume of data associated with the selection and promotion of naval officers cannot be adequately reviewed, digested, and accurately weighed by nine individuals composing a selection board. Gregory and Van Horn, two noted authors in the field of data processing, stated:

The quality of information is influenced by the degree of detail obtained about each event that occurs. Some details are lost when gathering facts about events because it is economically impossible to capture all the facts. The question is how much detail can be discarded and a useful quality representation of events still maintained. Pragmatic mistakes—wrong decisions based on the right picture—can occur at the point where information is used. A pragmatic mistake can arise because the decision rule is incorrect . . . Then, too, the correct rule could be incorrectly applied . . .

It is easy to produce an excessive quantity of information. Care must be taken to keep information tailored to a user's needs

and restricted to his ability to use it.⁵

The integrity of the selection board members cannot be questioned; however, their ability to use the excessive quantity of information furnished them and their ability to arrive at a proper decision in all cases is the questionable facet. The quality of the information, through misrepresentation by reporting seniors, is also questionable and adds to the dilemma. As a result, the total system with its various weaknesses cannot achieve fully its lofty goal of the selection and promotion of the best fitted.

The current information explosion demands the most effective and efficient means be used to handle management data. More and more organizations are turning to the computer to handle the volume of data generated. This new tool has performed herculean tasks in assisting managers. Why not the selection board? Almost inevitably there will be cries from the uninformed that computerization would remove the human element from the selection board process. Several assignments to a selection board and a familiarity with the potential of computers would soon dispel any doubts as to the value of computerizing the selection and promotion systems.

II

The Computerized System. Inasmuch as the foundation of all systems is based on the quality of the material or information supplied, we should be initially concerned with designing a fitness report system that will provide the best information for the selection process. Figure 4 portrays the elements considered essential to the report of fitness. While it differs appreciably from the present report of fitness, it does retain those major elements considered by today's selection boards. The frills and fat have been trimmed together with

I. Officer's Identity

- a. Social Security Number
- b. Last Name and Initials

II. Officer Information

- a. Rank
- b. Time in Grade
- c. Designator
- d. Command/Activity
- e. Employment of Command
- f. Primary Duty
- g. Collateral Duty

III. Evaluation

Category	Not Obs/App	Pass-Over	80% Select	60% Select	40% Select	20% Select	10% Select	Deep Select	Relative Weight
Primary Duty		0	1	2	3	4	5	6	4
Collateral Duty									1
Executive Management									*2
Technical Competence									*2
Human Relations									2
Communications									2
Behavior									1
Appearance									1
Bonus									1

IV. Reporting Senior's Identity

- a. Name
- b. Rank
- c. Social Security Number

V. Authentication

- a. Signature of Reporting Senior
- b. Date Signed

VI. Report Data

- a. Evaluation Period
- b. Basis of Evaluation

Fig. 4—Proposed Report of Fitness Elements

excess wording used to explain each entry. These explanations are best left to a single basic instruction. Information used for future assignments and qualifications is deleted in that such information is deemed more appropriate for an assignment or detailer-type report rather than an evaluation report used by selection boards. The skeletonized report of fitness is more in keeping with the trend toward avoiding the flood of information that is drowning today's managers.

The best means for identifying the officer being judged and correlating all data relating to him is his Social Security number. The remainder of the officer's identity section and the officer's information section are self-explanatory. The command, its employment, and the officer's primary duty, together with the evaluation, form the major criteria for the selection or non-selection of the officer. Proper weight can be assigned to the various billets based on the challenge and command involved.

The most important element of the

report of fitness is the reporting senior's evaluation of an officer. Misinterpretation of this element by either the reporting senior or the member of the selection board can be disastrous to an officer. Therefore, this element has been oriented toward the selection criteria, rather than word descriptions of performance. This disparity of word description is evident in the report of fitness used from 1962 to 1968, wherein Excellent in its section 14 was the second highest grade, while in section 20 the same word ranked the officer fourth in the grading system. The evaluation section shown in figure 4 provides seven grade levels and a "not observed/applicable" column for eight categories of the nine listed. These grading levels vary from "Pass-Over," the lowest, to "Deep Select"—i.e., accelerated promotion. The percentile levels falling between the two extremes allow the reporting senior to indicate his evaluation of the officer relative to his selection. For example, if a reporting senior marks an officer in the 40 percent Select column, he indicates to the board that if

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40 percent of the officers under consideration for the next higher rank are to be selected, he feels the officer should be selected. However, if only 20 percent of the officers under consideration are to be selected, then the reporting senior feels that the officer should not be selected. This word from the judge has more meaning to the jury, who must decide the officer's promotional fate, than words such as "good," "excellent," or "outstanding." It also provides the judge with the knowledge of exactly how the selection board will interpret his evaluation of the officer, rather than rely on the infamous "normal" distribution curve.

Incorporated into the evaluation section is the relative weight of each of the categories listed. This element provides the reporting senior a true reflection of how much weight each of his assigned evaluations will be given by the selection board. It also restricts the board as to how much weight should be given to each mark assigned, except in the case of Executive Management and Technical Competence. The relative weight assigned to these two categories is varied, depending on the rank of the officer under consideration; however, the total weight of the two cannot exceed 4.

The first eight categories generally summarize the majority of characteristics sought by many evaluation boards. Some have been extracted directly from the U.S. Air Force Manual dealing with officer effectiveness.⁶ Others have been based on information contained in the Navy's instruction concerning the evaluation of officers.⁷ The ninth category, Bonus, provides some flexibility to the judge. The Primary Duty and Collateral Duty categories need no detailed explanation.

The next two categories of evaluation, Executive Management and Technical Competence, require some explanation. These two have a combined relative weight of 4, which can be varied depending on rank. Normally, a weight

of 3 would be given to the Technical Competence category and a weight of 1 to the Executive Management category for the junior officer. The relative weights would be equal at the midpoint of the officer's career, in the lieutenant and lieutenant commander grades. In the commander and captain grades, the relative weights would be 3 for the Executive Management evaluation and 1 for the Technical Competence. Thus, these two categories provide the necessary variable essential to judging the officer against a yardstick that changes with the ascent of the individual through the officer grade structure.

Human Relations, Communications (both oral and written), Behavior, and Appearance categories are sufficiently understood to require no lengthy dissertation in the interest of brevity. However, the last category, Bonus, deserves elaboration. As a direct additive with no relative weight divisor, this category provides an area whereby special consideration can be given for those attributes the reporting senior considers worthy of note, but which are not included in other categories. These might include such things as heroic actions under battle conditions, participation in community affairs which bring credit to the naval service, noteworthy activity with the Boy Scouts or other youth programs, scholastic endeavors and achievements during off-duty hours. The maximum bonus allowed under this category is 3.

Following the evaluation of the officer, other pertinent data included in the report of fitness are the name, rank, and Social Security number of the reporting senior, the signature of the reporting senior for authentication together with the date signed; the period covered by the evaluation; and the basis upon which the evaluation was made. This latter provides the selection board a confidence factor in the evaluation marks assigned. The basis of the report can vary from "Daily Contact and Close

Observation" to "Records and Reports Only." A special code within this element allows the reporting senior to indicate if the report of fitness is a concurrent report.

The next step is to orient these elements for automatic data processing. Several methods of optical scanning are currently under development. They vary from an intricate method of converting data written in longhand to computer characters, through a simple method of converting data transcribed on a pre-planned form to computer characters. This latter method will form the basis for the design of the report of fitness proposed. Although it is not the ideal method, it is capable of supporting the system now.

Report Format. Figure 5 illustrates the proposed report of fitness suitable for direct computer introduction through an optical scanner. Only one check is required prior to introduction into the computer, and that is to confirm that the report is authenticated with the signature of the reporting senior. The name and designator of the officer will not be introduced into the computer from the form as these are considered superfluous to the system at this point.

The Social Security numbers of both the officer being judged and the reporting senior can be indicated directly on the form by marking the proper numerals. In addition, for the originator's confirmation, the numbers can be transcribed above the line for easy readability; however, information transcribed directly above any line on the format will not be "read" by the optical scanner. A check area is included for verification of the Social Security number as it is the key to the entire system and provides the necessary integrity.

The rank columns for both the subject officer and his reporting senior extend from 1 through 0 plus "A."

The Time-In-Grade (TIG) column ex-

tending from 0 through 9 indicates the years in grade directly. The "A" indicates 10 years and over in grade.

The Command section is divided into four major areas: Ship, Air, Fleet Staff, and Shore. Each of these areas can then be further identified by a code number representing the specific command or activity. Pertinent data relative to the employment of the command is also included.

The Period of the Report section allows direct transcription of the numerical month and last two digits of the year for the "From" and "To" dates.

The Primary and Collateral duties are represented by five digit numerical codes. These codes are based primarily on the *Manual of Navy Officer Classification*.

The Evaluation section on the proposed form lends itself to direct transcription with no need for coding, only familiarity with the meaning of the categories. The reporting senior marks his evaluation of each category under the proper column.

The Report Basis uses the numerals 1 through 6 and the letter "C," table I, describes the meaning of these characters.

TABLE I—REPORT BASIS CODE

1	Daily Contact and Close Observation
2	Frequent Observation
3	Primarily Supervisor's Observation
4	Infrequent Observation
5	Results of Work Only
6	Records and Reports Only
C	Concurrent

System Operations. The proposed computerized selection and promotion system consists of five major files, three identify files and two operational files. The identify files would primarily be used for providing identity to various numerical codes throughout the system, whereas the two operational files—the Evaluation File (File #1) and Reporting Senior's Multiple File (File #2)—would

Evaluation Report of				Designator					
Social Security No	Check	Rank	TIG	Command	Command Code #	Period of Report YR MO to YR MO		Primary Duty	Collat Duty
0 0 0 0 0 0 0 0	0 0 0 0	A	0	Ship	- 0 0 0 0 0 0 0	0 0 0	0 0 0	0 0 0 0 0	0 0 0 0 0
1 1 1 1 1 1 1 1 1 1	1 1 1 1	O	1	Air	- 1 1 1 1 1 1 1	1 1 1	1 1 1	1 1 1 1 1	1 1 1 1 1
2 2 2 2 2 2 2 2 2 2	2 2 2 2	9	2	Staff	- 2 2 2 2 2 2 2 2	2 2 2	2 2 2	2 2 2 2 2	2 2 2 2 2
3 3 3 3 3 3 3 3 3 3	3 3 3 3	8	3	Shore	- 3 3 3 3 3 3 3 3	3 3 3	3 3 3	3 3 3 3 3	3 3 3 3 3
4 4 4 4 4 4 4 4 4 4	4 4 4 4	7	4	Employment	- 4 4 4 4 4 4 4 4	4 4 4	4 4 4	4 4 4 4 4	4 4 4 4 4
5 5 5 5 5 5 5 5 5 5	5 5 5 5	6	5	Peace	- 5 5 5 5 5 5 5 5	5 5 5	5 5 5	5 5 5 5 5	5 5 5 5 5
6 6 6 6 6 6 6 6 6 6	6 6 6 6	5	6	War	- 6 6 6 6 6 6 6 6	6 6 6	6 6 6	6 6 6 6 6	6 6 6 6 6
7 7 7 7 7 7 7 7 7 7	7 7 7 7	4	7	Deployed	- 7 7 7 7 7 7 7 7	7 7 7	7 7 7	7 7 7 7 7	7 7 7 7 7
8 8 8 8 8 8 8 8 8 8	8 8 8 8	3	8	Fleet	- 8 8 8 8 8 8 8 8	8 8 8	8 8 8	8 8 8 8 8	8 8 8 8 8
9 9 9 9 9 9 9 9 9 9	9 9 9 9	2	9	Indp	- 9 9 9 9 9 9 9 9	9 9 9	9 9 9	9 9 9 9 9	9 9 9 9 9
		1	A	Forgn					

EVALUATION										
Category	Not Obs/App	Pass-Over	80% Select	60% Select	40% Select	20% Select	10% Select	Deep Select	Relative Weight	Report Basis
Primary Duty		0	1	2	3	4	5	6	4	
Collateral Duty									1	1
Executive Management									*2	2
Technical Competence									*2	3
Human Relations									2	4
Communications									2	5
Behavior									1	6
Appearance									1	C
Bonus									-	

Reporting Senior's Social Security No	Check	Reporting Sr.'s Rank:	A
0 0 0 0 0 0 0 0 0 0	0 0 0 0		0
1 1 1 1 1 1 1 1 1 1	1 1 1 1		9
2 2 2 2 2 2 2 2 2 2	2 2 2 2		8
3 3 3 3 3 3 3 3 3 3	3 3 3 3		7
4 4 4 4 4 4 4 4 4 4	4 4 4 4		6
5 5 5 5 5 5 5 5 5 5	5 5 5 5		5
6 6 6 6 6 6 6 6 6 6	6 6 6 6		4
7 7 7 7 7 7 7 7 7 7	7 7 7 7		3
8 8 8 8 8 8 8 8 8 8	8 8 8 8		2
9 9 9 9 9 9 9 9 9 9	9 9 9 9		1

Name & Signature of Reporting Senior	Date
--------------------------------------	------

Fig. 5—Report of Fitness

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contain the data essential to the evaluation of officers. Figure 6 depicts the contents, fields, and field lengths of these two operational files. The majority of the data in File 1 is self-explanatory and based on previous discussions of the redesigned report of fitness. The meaning of File 2 and the remaining areas of File 1 will become clear as we proceed with the subsequent operational discourse of the system.

Two operational phases would be involved in the computerized system. The first phase is the day-to-day updating of the two operational files, Files 1 and 2, when the reports of fitness are received. The second operational phase is the actual selection process.

The flow chart shown in figure 7 depicts the general operations in the first phase using a random access type computer. The sequence is initiated upon receipt of the report of fitness. From the data provided, the computer calculates the officer's multiple from the evaluation section. Each category evaluation is multiplied by its relative weight, and the summation of this weighted evaluation is divided by the summation of the weights considered.

The example shown in figure 8 illustrates the determination of a lieutenant commander's multiple. The multiple is incorporated into field 11 of the officer's evaluation file and added to field 10 of the reporting senior's multiple file—File 2, for lieutenant commanders. Field 9 of File 2 is incremented by 1 and the average multiple is recalculated and incorporated in field 11 of File 2 and field 16 of the officer's evaluation in File 1. Figure 9 illustrates the updating of the reporting senior's file for the lieutenant commander category. The final action of the updating routine is the on-line storage of the officer's evaluation file and the updated reporting senior's multiple file.

The second operational phase of the system is illustrated in flowchart format in figure 10. This phase is initiated with the establishment of the selection zone. The precedence numbers of all officers within the zone are introduced into the computer, and from these numbers the Social Security numbers of all reporting seniors are obtained from File 1. The resulting numbers are augmented with each reporting senior's average multiple for the rank involved obtained from File 2. The selection zone average multiple

1. EVALUATION FILE (Stored in order of Precedence Numbers)

Field: (1) (2) (3)
 Precedence No. - 8; SocSecNo - 9; Check - 4;
 Field: (4) (5) (6)
 Reporting Period - 8; Command Type - 1; Command - 7;
 Field: (7) (8) (9)
 Employ - 4; Pri Duty - 5; Collateral Duty - 5;
 Field: (10) (11) (12) (13)
 Evaluation - 9; Multiple - 4; Basis - 1; Rank - 1;
 Field: (14) (15) (16)
 Rpt.Sr.SocSecNo - 9; Check - 4; Rank Avg.Mult.to Date - 3.

2. REPORTING SENIOR'S MULTIPLE FILE (Stored in order of Social Security Numbers - increasing)

Field: (1) (2)
 SocSecNo - 9; Check - 4.

	CAPT	CDR	LCDR	LT	LTJG	ENS	WO
No. Evals - <u>4</u>	(3)	(6)	(9)	(12)	(15)	(18)	(21)
Total Multiples - <u>6</u>	(4)	(7)	(10)	(13)	(16)	(19)	(22)
Average Multiples - <u>3</u>	(5)	(8)	(11)	(14)	(17)	(20)	(23)

Fig. 6—Operational Files

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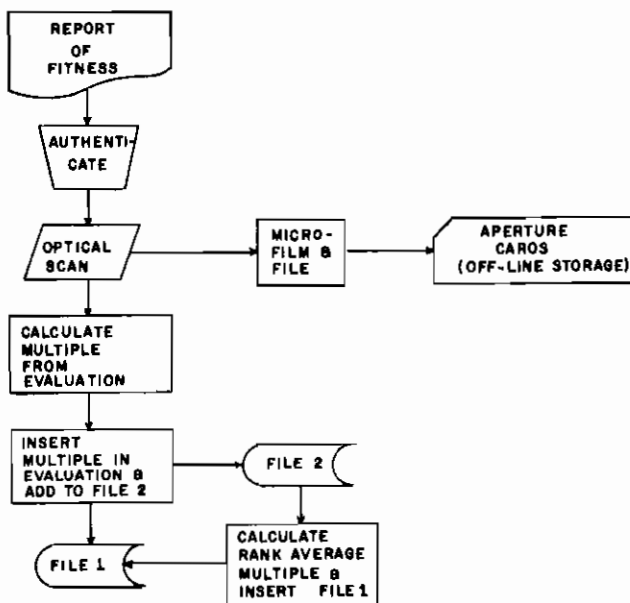


Fig. 7—Flowchart—Updating Routine

		EVALUATION							
Category	NA	0	1	2	3	4	5	6	Weight
1							X		4 = 20
2						X			1 = 4
3							X		*2 = 10
4					X				*2 = 8
5					X				2 = 8
6					X				2 = 8
7							X		1 = 5
8					X				1 = 4
9				X	-	-	-		- = 3
									<hr/>
							Sum		15 70

Evaluation Multiple = $70 \div 15 = 4.66$

Fig. 8—Example of Officer Multiple Determination for Lieutenant Commander

	LCDR		New Eval Multiple		LCDR'
No. Evals.	37	+	1	=	38
Total Multiples	204.96	+	4.66	=	209.62
Average Multiple	5.54				5.52

New Average Multiple = $209.62 \div 38 = 5.52$

Fig. 9—Example of Updating Routine for Reporting Senior's Multiple File - LCDR to LCDR'

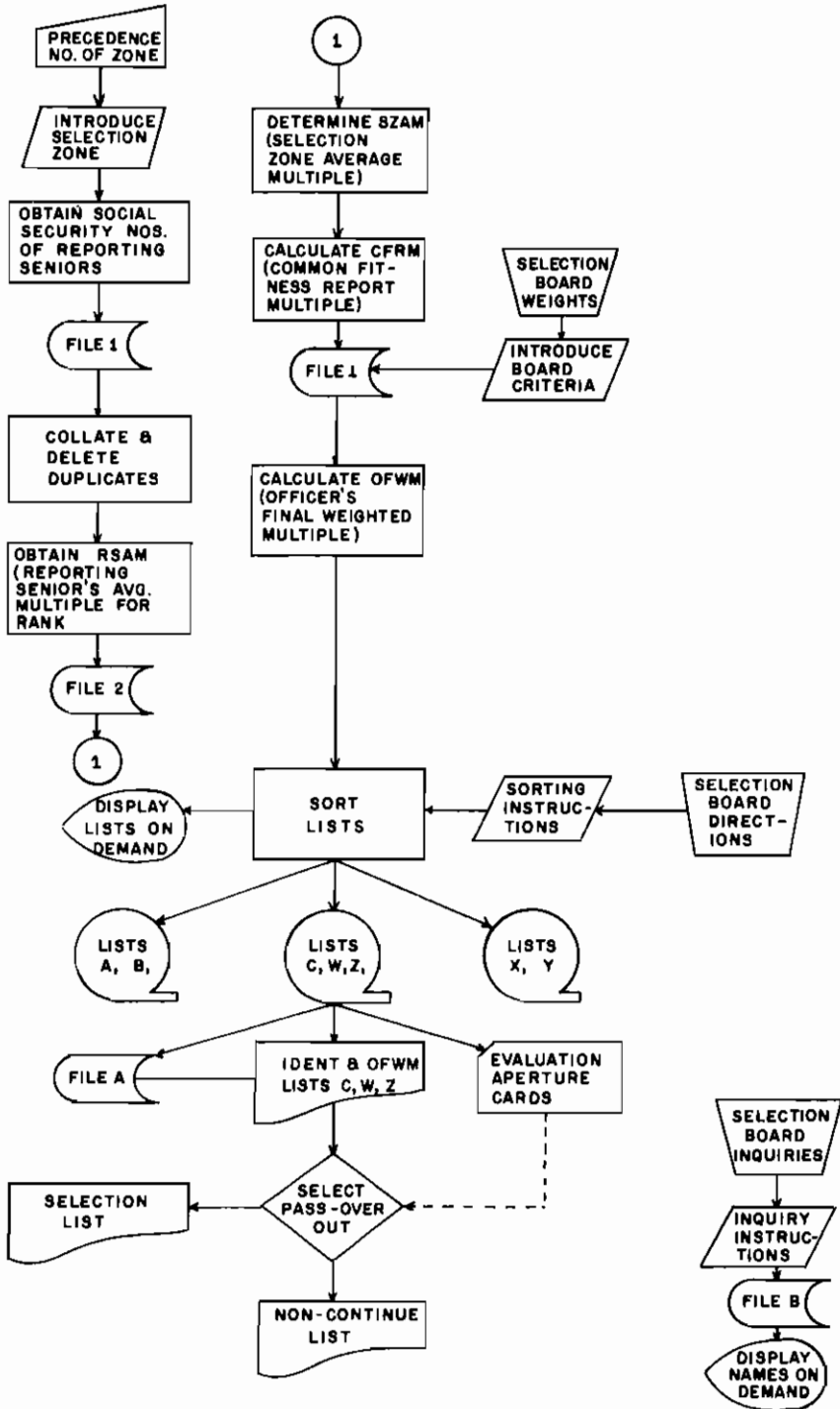


Fig. 10—Selection Flowchart

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(SZAM) of reporting seniors is then determined by adding all their average multiples and dividing by the number of reporting seniors involved. The next step is to equate each fitness report multiple (FRM) of every officer with his reporting senior's average multiple (RSAM) as compared to the selection zone average multiple (SZAM). This establishes a common fitness report multiple (CFRM), and it is calculated as follows: $CFRM = FRM \div RSAM \times SZAM$.

The calculation of a common fitness report multiple for all officers in each selection zone is a fixed process in the second operational phase of the proposed system. The follow-on process is flexible, and its parameters are determined by the individual selection boards. The process can be divided into two parts, the selection criteria and the sorting direction.

In the selection criteria process, ground rules are established by the selection board for fixing weights to the various elements of the evaluation report. This area is the heart and control of the computerized system, and its inputs are based on the experience and expertise of the members of the selection board. There are seven elements which can be weighted by the board, not including the rank of the reporting senior, which could also be a weighted element. The seven elements are the type command, the command, the employment of the command, the primary duty, the collateral duty, the length of the reporting period, and the basis of the report. All programs are initialized with weights of 1.0 assigned to each of the seven elements, thus requiring a positive action on the part of the selection board to modify the criteria. In other words, all type commands (ship, air, staff, and shore) would have a weight of 1.0, unless the board decided specific types should have a higher relative weight than others. In the case of particular commands, the selection board could assign the Navy Depart-

ment commands a relative weight of 1.1 to denote their importance or challenge. This multiplication factor will then be applied to each officer's Common Fitness Report Multiple where a Navy Department command code is indicated. The determination of the Officer's Final Weighted Multiple, OFWM, for each officer in the selection zone completes the first part of the second operational phase, the selection criteria.

The final operation of the computerized system deals with sorting the information into logical files for the selection board. This add-on operation can be simplified by producing a single collated list of officers in the selection zone, listed in descending order in accordance with their Officer's Final Weighted Multiple. However, by injecting the maximum number of officers that can be selected, as provided by the Secretary of the Navy and the Bureau of Naval Personnel, and inserting simple sorting instructions, the computer system can provide additional assistance to the board.

Current selection boards provide multiple reviews of those officers' records just above and below the selection-passover line. In addition, selection boards are charged with recommending officers within the zone for noncontinuance whose records indicate their performance is substandard. To aid in the accomplishment of these functions, the sorting direction shown in figure 11 provides a guideline of departure for selection boards. These directions provide for a percentile division of the selected and the passed-over officers within the zone, three divisions in the selected area and four divisions in the passed-over area. The lowest 5 percent in the selected area and the top 5 percent in the passed-over area, lists C and W, are sorted to provide records to be reviewed by the selection board to ensure that the division between officers selected and passed over is correct. Lists B and X are provided in the event the

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Select			Pass-over		
List		Percent	List		Percent
A	Top	85	W	Top	05
B	Next	10	X	Next	10
C	Next	05	Y	Next	80
			Z	Bottom	05

Fig. 11—Sample Selection Board Sorting Instructions

selection board wishes to expand this review. List A contains the names of those officers whose selection is untested. Lists Y and Z lists those officers passed over. List Z is sorted to provide the selection board with the names of officers whose records should be reviewed to ascertain their fitness to continue on active duty. Upon completion of the various reviews by the selection board, officers' names can be incorporated into the final two lists, selection and noncontinuance.

In summary, the seven major steps contained in the selection board operational phases of this automated system are:

1. Determine Selection Zone Average Multiple.
2. Adjust all officers' multiples to the Common Fitness Report Multiple using the Selection Zone Average Multiple.
3. Introduce the selection board criteria and weights.
4. Calculate each officer's Final Weighted Multiple.
5. Correlate all officers' Final Weighted Multiples in ascending order.
6. Introduce selection board sorting instructions.
7. Print the Selection List and the Noncontinuance List.

The redesigned fitness report together with the computerization of the data results in a synergistic effect that enhances the overall system. The report is more readily prepared and understood by the reporting senior. It is also more readily introduced into the computer. The computer not only provides a faster means of correlating the data, but provides a powerful tool to the selection

board. The overall system, as well as the facets within it, is flexible. Expansion and contraction of the system is possible; augmentation of the system with other systems is possible; and use of the system to serve other selection purposes is possible.

III

Conclusions. Close examination of the present operation of the selection and promotion of naval officers reveals several weaknesses. These can be summarized as follows:

- Skewed grading distribution (vice the normal curve)
- Junior officer-senior officer comparison
- Disparity between judges (high and low graders)
- Inability to apply selection ground rules equitably
- Voluminous data to correlate

Implementation of the computerized system proposed, together with the proposed revision to the report of fitness, can nullify or reduce appreciably these five major weaknesses of the selection process.

The revision of the report of fitness in the evaluation grading area will reduce appreciably the inequities and misunderstandings caused by the grading descriptions presently used. These descriptions, together with the inappropriate reliance on the normal curve, would be replaced by the selection percentile grading incorporated in the proposed format. This same formatting should influence the reporting seniors to base their grades on the officer's present rank and potential for

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the next higher rank, rather than compare him to other officers possibly more senior. Thus the change in the working and layout of the evaluation section of the redesigned report offsets the first two weaknesses of the present system.

The third weakness of the system, disparity between judges, is corrected in the computerized system in steps. First, the system relates the officer's grade to the reporting senior's past history of grades assigned to officers of the same rank. This not only provides a comparison grade for the officer being judged, but also establishes the reporting senior's average grade for each rank level. Using the reporting senior's average grades, a norm can be established within a particular zone, thereby providing the necessary leveler to all the graders from the most lenient to the harshest judge.

The fourth weakness revolving around the inability of the present system to apply selection ground rules equitably is easily conquered through the use of the computer. The reduction of the 28 grading categories and five control areas of today's fitness report to nine elements on the briefing sheet still produces a sizable task. These nine elements must be multiplied by the number of fitness reports each officer has in his file. With an average of 24 reports for lieutenants under consideration for lieutenant commander selection, the application of selection ground rules would have to consider over 200 elements in the summary records of each officer, or over 750 elements in his fitness report files. Through a simple computer program, the system proposed can apply the selection board ground rules equitably over the entire spectrum of reports. This operation is accomplished easily through the assignment of weights to the ground rules to be used as multiples where appropriate.

The last major weakness of the present selection system, like the fourth weakness, is easily overcome by using a

computer system. Using the example of the lieutenant commander selection with the number of selection elements varying from 200 to 750 for each officer in the zone and considering that approximately 2,500 officers are in the average zone, a minimum of about 500,000 selection elements must be reviewed. This poses a difficult task for a board of nine officers, not only to review, but to correlate. Handling voluminous data is the "bread and butter" of a computer. Through the introduction of the selection board's instructions into the computer, it is capable of providing the information in the form desired. Depending on the computer system and equipment employed, the information can be presented in a variety of forms, including the cathode-ray tube, paper printouts, and punchcards. Use of the on-line cathode-ray tube equipment in the computerized system could eliminate the necessity of the selection board physically handling any of the records or information relative to the selection. However, it is visualized that the final selection and noncontinuance listings would be paper printouts for the board's signature.

By itself the system offers additional advantages with minimum effort. Officers with particular backgrounds or experiences can be quickly and easily located to fill specific billets. This can be accomplished by using the code numbers representing the background billets desired, as obtained from the *Manual of Navy Officers Classification*. If a certain level of performance is desired in these background billets, introduction of the lowest evaluation multiple acceptable can provide a sorting medium.

Statistical data can also be obtained from the selection and promotion files. Data such as the number of officers serving in a particular billet during a particular period of time can be summarized. How many officers are

assigned to a particular command, their names, their designators are also available in the system. This latter type of information makes up the major portion of the Navy's current Officer Distribution Control Report.

One other drawback of the present fitness report system is that the officer concerned usually does not see his evaluation unless he makes a trip to the Officers Record Review Room located in Washington, D.C. Thus many years may elapse without the officer knowing his strengths and weaknesses. This can be equated to a student attending college without receiving the graded results of any tests until 4 years elapse, and only then be informed he has been selected for graduation or passed over. The proposed system is capable of producing periodically, with little effort, a computer printout report summarizing the officer's evaluation multiples, similar to the briefing sheets portrayed in Captain Scanland's article. This report can be forwarded to the individual officer for both information and validation.

All these additional advantages can be obtained with minor programing changes, without disturbing the integrity of the selection and promotion files. Administrative operations can be introduced into the computer to ensure the completeness of the files, that there are no lapses of evaluation coverage for any officer. Any lapse uncovered could

automatically result in the computer preparation of a form letter to the command or reporting senior concerned.

Innumerable side benefits can be achieved with the computerized selection and promotion system proposed; however, its prime objective is to overcome the weaknesses inherent in the present manual-clerical system now in use. The proposed system can achieve this objective. Its integrity is not suspect. It is capable under the guidance of the selection board to select the best fitted and most qualified naval officers for promotion.

BIOGRAPHIC SUMMARY



Capt. George H. Lewis, U.S. Navy, earned his bachelor's degree from The George Washington University and holds a master's degree in computer science from American University. His early

career was spent in patrol craft and minesweepers, and he later served as Commanding Officer of the U.S.S. *Norton Sound* (AVM 1) and of the U.S.S. *Burton Island* (AGB 1). Captain Lewis has had duty with the Joint Chiefs of Staff and is currently Director of Management Information/Data Systems Division of the Naval Ordnance Systems Command.

FOOTNOTES

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