

AD-A114 009 DUKE UNIV DURHAM NC CENTER FOR APPLIED BUSINESS RESEARCH F/G 5/9
A MULTI-YEAR BUDGET GENERATION PROGRAM FOR USE IN NAVY RECRUITI--ETC(U)
OCT 81 R C MOREY, J M MCCANN, D P ROBINSON N00014-80-C-0200
UNCLASSIFIED ONR-200-2 NL

1 of 2

2000

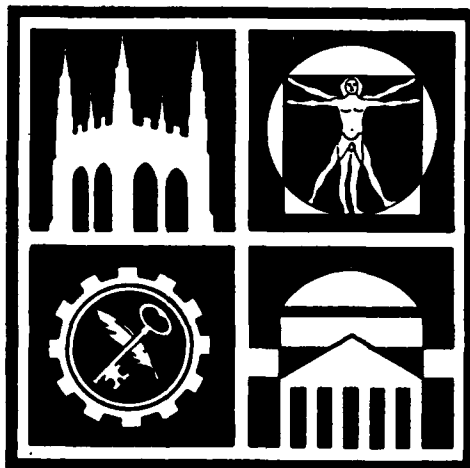
A large rectangular area consisting of a grid of approximately 10 columns and 10 rows of cells. All cells in this grid are completely blacked out, obscuring any text or data that might have been present. The grid is positioned to the right of the '1 of 2' and '2000' text.

AD A 114009

12

Center for Applied Business Research

Graduate School of Business Administration



Duke University

Durham, North Carolina

DTIC FILE COPY

DTIC
SELECTED
APR 28 1982
A

This document has been approved
for public release and sale; its
distribution is unlimited.

82 04 27 106

A Report Prepared for Naval Recruiting Command
and the Office of Naval Research Under Contract N000-14-80-C-0200

A MULTI-YEAR BUDGET GENERATION PROGRAM
FOR USE IN NAVY RECRUITING: A User's Manual

October, 1981

Principal Investigator: Richard C. Morey, Ph.D.

Associates: John M. McCann, Ph.D.

David P. Robinson, Ph.D.

Varsha Rao

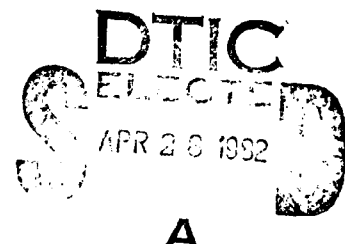
CENTER FOR APPLIED BUSINESS RESEARCH

FUQUA SCHOOL OF BUSINESS

DUKE UNIVERSITY

DURHAM, NORTH CAROLINA

(919) 684-2012



This document has been approved
for public release and its
distribution is unlimited.

TABLE OF CONTENTS

	<u>Pages</u>
0.0 Executive Summary	1-iv
1.0 Objective of Multi-Year Budget Generation Program	1-3
2.0 General Method of Attack	4-5
3.0 Inputs to the Program	
3.1 General	5-11
3.2 Special Inputs for Budget Generation Mode	11-13
3.3 Special Inputs for Budget Execution Mode	13
4.0 Factors Used But Not Input By User	13-15
5.0 Detailed Example for Budget Generation Mode For Single Year: Quota On High School Graduate Accessions for FY79	
5.1 Inputs	15-16
5.2 Outputs of Computer Analysis for the Stated Set of Parameters: Contents of Reports	17-23
5.3 Comparison of Actual Levels versus Theoretically Ideal Levels for FY79	23-29
6.0 Detailed Input Formats and Use in Multi-Year Planning	
6.1 General Considerations	29-30
6.2 Use in Multi-Year Planning	30-32
6.3 The Base File Layout	33-35
6.4 The Scenario File Layout	36-37
6.5 The Control File Layout	38
6.6 The Results File Layout	39
6.7 Numerical Illustrations for 2 Year Horizon for HSG Accessions	40-114
6.8 Numerical Illustrations for 1 Year Horizon for Upper Mental, High School Graduates Accessions	115-149

The Program's principal inputs are: accession quotas for each year, the size of the Delayed Entry Pool desired at the end of each year, the annual costs of a recruiter, and key demographics related to the number of male High School seniors, pay ratios, and general unemployment scenarios. A host of other demographics related to size of labor force, property, ^{ratio} percent black, urban-rural breakdowns, etc. can be entered also. If these are not entered, the Program still runs but with the actual levels for FY79.

~~A~~

recruiter expeditions; the "optimal" number of recruiters in each of the six Recruiting Areas; the "optimal" geographical mix and timing of advertising expenditures; the optimal flow of enlistment contracts over time and geographically; the optimal flow of accessions geographically and over time.

The Program takes into account a set of initial conditions, at the beginning of the horizon, related to the size of the initial DEP and its distribution geographically, and the levels of recruiters and advertising prior to the start of the horizon. It incorporates: attrition^{*}; the empirical delay factors associated with the Delayed Entry Program; lagged effects of recruiters and advertising effects; the diminishing returns nature of advertising and recruiting efforts; and the separate impacts of demographics. It is built on the results of extensive econometric analyses which yielded very close predictions (4% - 7%) when applied to a separate year of data. Results are included which show the real results for FY79 compared to the "optimized" results.

The multi-year capability automatically takes into account the strong coupling or interaction effects between years due to the changing DEP position and the lagged effects of recruiter and advertising efforts. The Program calculates for the first year of the multi-year horizon the minimum costs to meet given accession quotas and a DEP requirement for the first year. The user must input initial conditions for the first year only. The ending conditions for the first year then automatically become the initial conditions for the second year so that the Program continues in this

* This refers to shrinkages occurring in the Delayed Entry Program whereby individuals sign an enlistment contracts but then subsequently change their mind and never become an accession. This shrinkage is estimated to be about 4.5%.

leap frog manner. The user can easily vary the accession and DEP goals for each year, the demographics, and the economic scenarios. A detailed illustration for a two year horizon, together with all the inputs and outputs, is included.

The user should be aware of two considerations in interpreting the results: the assumed annual costs per recruiter (including his support) is an input that can be easily modified and could use more definition. The runs illustrated for FY79 and FY80 have used a cost of \$26,009 (in FY79 dollars). Hence the user needs to be cognizant that, if he wishes to include retirement benefits, etc., this annual cost per recruiter figure needs to be increased; a higher annual recruiter cost will change the recommended mix of this resource versus that of advertising. In the same vein, the advertising costs now being outputted are only the placement costs and do not reflect any overhead, copy generation, profits, etc. The Program can easily accept such factors once they become available. When these overhead type costs are entered, the optimal mix of recruiters efforts versus expenditures will also be affected.

In summary the Program represents a powerful tool to defensibly explore the dollar impacts of varying quotas, DEP positions, demographics, economic scenarios, cost per recruiter, attrition, etc., in a multi-year setting. It has been used by the Navy for the past two POM cycles and shown to yield results which are very reasonable and intuitive. It can be of substantial aid in the Navy's goaling process, in tactical decisions regarding reallocation of efforts to minimize shortfalls (using the Program's so-called Budget Execution Mode), and in providing inputs to better manage and provide

goals for the Navy's Delayed Entry Program. The reader is referred to another report by this Principal Investigator entitled, "A Goal Setting Procedure for the Navy's Delayed Entry Program," (October, 1981) for the use of this Budget Program in this context.

1.0 OBJECTIVE OF MULTI-YEAR BUDGET GENERATION PROGRAM

This program has the objective of estimating the minimum dollar budgets needed by fiscal year to obtain 1) prespecified levels of male, non-prior service, active duty (Mariners plus reservists), High School Graduate shipments by year; 2) given DEP requirements for the above category of recruits at the end of the given years. This is accomplished for each of the specified fiscal years, and recognizes the interactions operating between years due to the DEP positions and the lagged effects of advertising and recruiters' efforts. In addition to this important multi-year capability, the Program can also of course be run for a single year. The user will also have the option of concentrating on Upper-Mental High School Shipments by year (instead of High School Graduate Shipments) if he desires, Upper-Mental being the categories I-III A. Hence to illustrate, if it is desired to generate the budgets for FY82 and FY83 (in say FY81 dollars), one needs the following types of information:

- 1) The yearly quotas on shipments (of either of the above type) for each year. This quota can be accepted in several different forms to be discussed subsequently;
- ii) The desired size of the Delayed Entry Pool for this same type of recruit for the end of FY82 and FY83;
- iii) The scenarios for FY82 and FY83 related to the number of male High School seniors and the general unemployment rate. These are needed by Recruiting Area (of which there are 6) and by month for the fiscal years of interest. (If these are not specified, the Program will default to the values present for FY79 which are included in Appendix A.)
- iv) Any other changes from FY79 for the following demographics: propensity to enlist, labor force size, ratio of military pay to civilian pay,

racial mix and urban-rural mix. Once again if no new values are desired, the program by default utilizes those for FY79. These are included in Appendix B. It is not as necessary for the user to modify these later demographics as it is for male High School seniors and the unemployment rates as the production of quality contracts is not as sensitive to the latter demographics.

v) The estimated size of the Dep position for the type of recruit of interest at the beginning of the decision horizon (in this case FY82).

vi) The assumed yearly cost for a recruiter and some initial conditions (for the two months prior to FY82) related to the number of recruiters in the field, and the levels of advertising expended.

The Program then generates by fiscal year, taking into account the strong interactions between fiscal years (related to the lagged effect of recruiters, and advertising on obtaining quality contracts) the following:

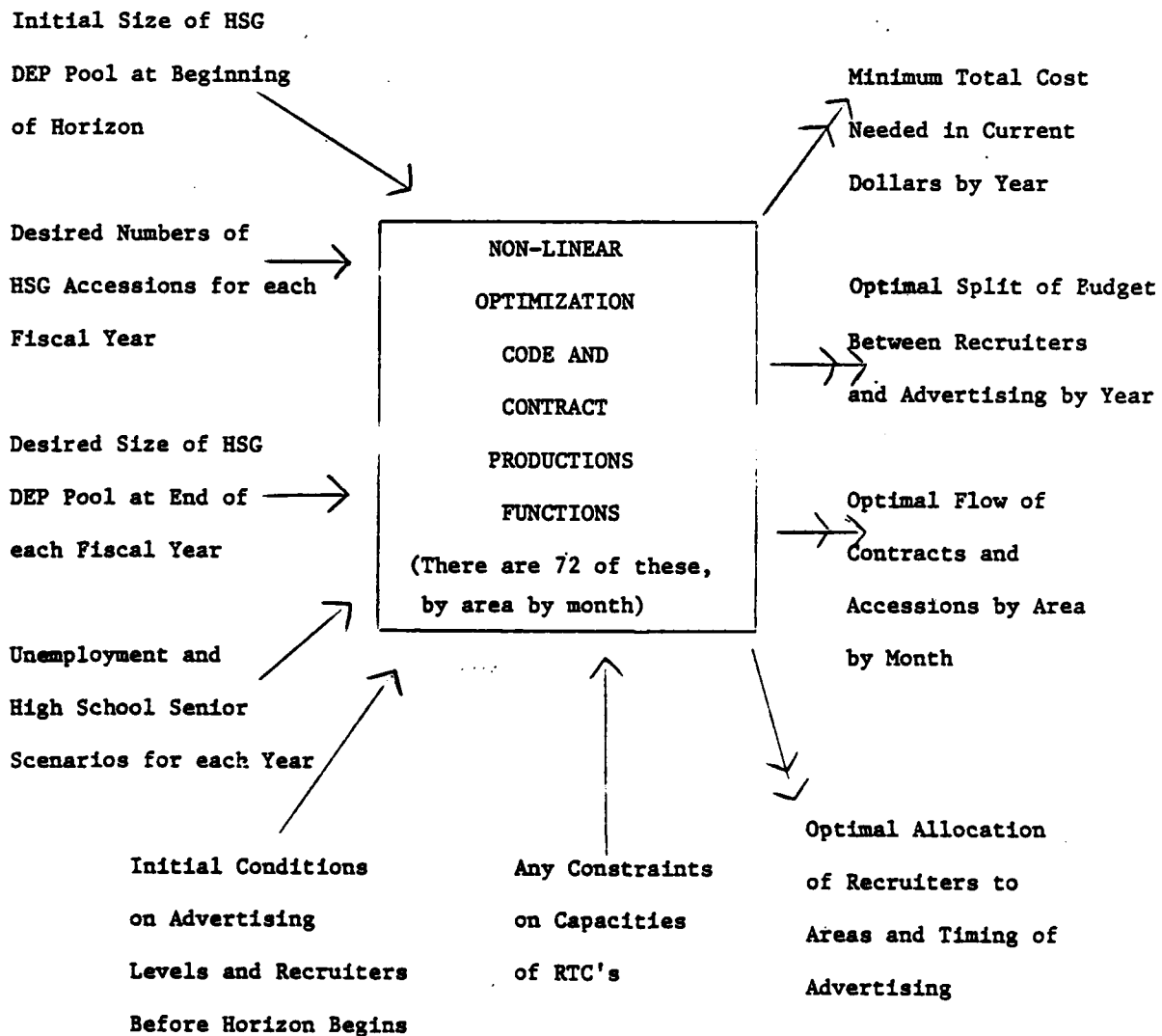
- i) the minimum total budget required for each fiscal year;
- ii) the optimal split between recruiter activity and all advertising expenditures;
- iii) the number of recruiters in each area;
- iv) the level of advertising by month by area;
- v) the estimated flow of contracts and shipments by area by month.

The advertising cost can include not only the actual placement costs, but also overhead costs, fees for the advertising agencies, copy generation, etc. if these are known. It does not include any JADOR expenditures.

These overhead costs are not known at the moment but the Program has been designed to incorporate these factors once they are known. In the meantime the advertising costs developed are the placement costs only.

Figure 1 summarizes the inputs and outputs of the Budget Generation Program.

OVERVIEW OF MULTI-YEAR BUDGET
GENERATION PROGRAM



2.0 GENERAL METHOD OF ATTACK.

It accomplishes the above through the use of a non-linear optimization program which involves some 216 variables per year dealing with levels of recruiters and advertising for 6 areas over 12 months. For more details the reader is referred to an earlier ONR report, "Budget Allocation and Enlistment Products Models for the Navy's Recruiting Command: The Proper Balance Between REcruiter and Advertising Efforts," May 1979. The crux of the program is a set of 72 non-linear production functions which depict the numbers of quality contracts attained by Recruiting Area and by month, if various resources are allocated to it at given points in time. These production functions were developed based on extensive regression analysis for the years 76-78 and have been validated and shown to yield within 3% of the actual national totals for FY79. The fit of the production functions over the 6 Areas is also quite good (an average absolute error of 7%) and incorporate key demographics for each Area such as its unemployment rate, percent black, the urban rural mix, etc. The fit could be improved even further if one desired to capture differences in actual recruiting efficiencies across the Areas. However, this has not been done since "efficient" areas might then be penalized by being allocated higher quotas. The user need not concern himself with the elasticities for recruiters and advertising nor their lags as these are "hardwired" into the Program. For information sake, the long run elasticity being used for recruiters is .7267 and for all advertising, it is .0561.

The computer program for the optimization system is based largely on the MINOS (for Modular In-core Nonlinear Optimization System) code developed by Michael Saunders of Stanford University. Detailed information

on MINOS is provided in the MINOS User's Manual and the MINOS System Manual which are provided with this user's manual. It is not necessary for the user of the allocation model to have much knowledge of MINOS, however, so these two documents should be regarded as additional reference tools.

The rest of this document describes the system inputs and outputs in more detail. These values are read and written by a set of modules which are not part of the MINOS system and hence are not described in the MINOS manuals. The user should refer to the MINOS documents for system problems arising in the optimization phase of the model.

3.0 INPUTS TO THE PROGRAM

3.1 General

There are three basic input files which the user needs to be aware of in order to exercise the Program. The first is what we shall term the scenario file. It contains label cards containing the various demographic inputs, by Area by month, for each of the Fiscal years of interest. The first two items deal with the male High School senior population and the unemployment rate. The others are the other 5 demographics mentioned earlier. If the user chooses to enter nothing on a given label card, the Program will default to the levels existing in FY79 (see Tables 3 and 4 of Section 4.0). This scenario file is used to construct the 72 non-linear contract production functions, for each of the fiscal years, to be manipulated in the optimization. These 72 non-linear production functions capture differences in the number of quality contracts that would be obtained, across different areas and different months, if the same stream of recruiter resources and advertising resources were expended.

If it is desired to make a 5 year run (the maximum presently allowable) and if only 2 years of scenario data are included, the Program automatically utilizes the second year's scenario for the third, fourth and fifth years.

Consider now the other inputs to the "Scenario" File. They include:

- i) Quotas for High School Graduate Shipments (these include GED's and are slightly different than High School Degree Graduate Shipments).

The quotas on High School Graduate shipments (or alternatively on upper Mental High School Graduate Shipments) for the years in question can be presented in one of three ways:

- a) a single number representing the annual, national quota for the year in question. If this number is used, then one might also wish to include upper bounds on the number of these shipments that one would be willing to accept in any given month; presumable this is derived from the capacities of the Recent Training Centers. If no bounds are input, the Program defaults to a "no bound" case.
- b) twelve monthly, national quotas, representing the levels of shipments required by month from the entire country for each year. (It should be noted that the use of monthly quotas, rather than a national, yearly figure, will result in a higher minimum budget since the model is more constrained in how to most economically meet the quota.)
- c) 72 area-monthly quotas, for each year representing the level of HSG shipments desired by month from each of the 6 areas. Clearly this represents the most constrained scenario of the three and hence would result in the largest budget required. This third possibility allows the user to include quotas developed from an outside source such as the Navy's Goaling Model.

ii) Assumed Monthly Cost for a Recruiter

One of the key inputs is the assumed monthly cost for a recruiter, including his support cost, i.e. auto, telephone, clerical, benefits, etc. It is important to stress this number must be entered in 1967 dollars since all the production functions were derived using 1967 as the benchmark year for purchasing power. It is also important to understand how RAD (recruiter aid materials dollars) have been handled. Since it was not known when RAD materials were actually distributed in the field, it was assumed in the statistical analysis that their impact varied directly with the number of recruiters actually in the field. Hence it is appropriate in the budget allocation effort to include a prorated portion of the RAD expenditures in with the monthly cost of a recruiter.

To illustrate these ideas consider the development of the dollar figure used in the FY79 benchmark run for the monthly recruiter cost, the strong recommendation being that much more work needs to be expended by the Recruiting Command to decide which cost elements to include, i.e. retirement, fringes, direct pay, etc. To illustrate, consider the appropriate computer input to the Program if one were interested in FY79 and when the yearly cost/recruiter (in FY79 dollars) was known to be \$26,009. Since the average inflation factor for FY79, relative to 1967 was 2.039, one arrives at an inflation adjusted, monthly recruiter cost of $\frac{\$26,009}{12 \times 2.039} = \$1,063$. Hence this is the number, namely \$1063, to be input by the user for FY79 if he feels that the annual cost of a recruiter, including support costs, is \$26,009 in FY79 dollars.

For the record this number of \$26,009 for FY79 was based on cost estimates of \$21,190 for a recruiter in 1976. This number was inflated to 79 dollars and a prorated portion of RAD dollars actually expended in FY79 added. (The total RAD expenditures in FY79 were \$3.799 million and

the total number of recruiter man-years actually used was 3,405. Hence a prorated yearly cost per recruiter for RAD materials is $\frac{\$3,779 \times 10^6}{3,405} = \$1,104$ (in FY79 prices.)

If a higher figure is included, the optimal number of recruiters will decrease and more advertising expenditures will be warranted.

iii) Inflation Considerations: In What FY Dollars is Budget Desired?

Assume that one desires to exercise this Program for the FY82, and that in preparing the budget request one desires the dollars to be estimated in FY81 prices. Then one needs to input the inflation factor for FY81, relative to 1967 prices. As an example this number is 2.039 for FY79. Hence if one desired to develop the minimum budget for FY82 in FY79 prices, one would use 2.039 as the factor and state the results in terms of FY79 prices. In the multi-year use, the dollars reported would utilize only one inflation factor so that all of the budgets generated would be in constant dollars for some base year.

iv) The Desired Size of the Delayed Entry Pool (for the entire country) at the end of each of the Fiscal Years of Interest. Hence if the model is run for 2 years, then two dep pool targets are needed. It is important to stress this number is for male HSG, recruits, non-prior service (active Mariners plus reservists) and not the total size of the DEP pool.*

This capability allows one to assess the cost impact of shrinkages or increases in the DEP pool and to make tradeoffs regarding e.g., building up more DEP in one fiscal year to help meet high quotas in some outyear. Given the diminishing return nature of advertising and recruiters efforts, it becomes economically attractive to attempt to smooth large variations in the year-to-year quotas.

*An alternative version of the Program is available for Upper Mental HSG shipments, quotas, and DEP targets.

v) The Initial Size of the Delayed Entry Pool at the Beginning of the Horizon

One of the key inputs relate to the initial size of the Delayed Entry Pool at the beginning of the horizon. It is important to stress that this quantity is to be given for the particular type of recruit being studied, i.e. male, non-prior service HSG recruits, or male, non-prior service, upper mental High School Graduate Recruits in the alternative version of the Program.

Hence, to illustrate, the estimated number of contracts designated as High School Graduates in the Delayed Entry Pool as of October 1, 1978 (i.e. the beginning of the FY79) was 10,833. These individuals, less any attrition while in the pool, (estimated to be about 4.5%) will be available to help meeting shipping quotas for FY79. The Program automatically phases in the shipments over time from the Pool to offset the actual shipping quotas.

These factors were based on a detailed analysis of what actually occurred for FY79, taking into account the size of the pool at the point in time of October 1, 1978, the changing size of the DEP program by month, the number of contracts being signed and the number of accessions by month. The 12 factors "hardwired"* into the Program which spread the Pool over the next 12 months are:

Table 1

The Shipping Proportions (Adjusted for Attrition) for Those in the Delayed Entry Pool at the Beginning of a Fiscal Year Who Actually Ship

October	30.1%
November	13 %
December	10 %
January	8.1 %
February	4.3 %
March	7.2 %
April	2.9 %
May	3.0 %

*There are a number of factors such as these, which the user typically will not need to be concerned with, which are contained in the so-called base file which can be modified on a periodic basis or whenever better information becomes available. These are discussed in Section 3.

June	16.4%
July	2.8 %
August	2.0 %
September	.2 %
	<u>100.0%</u>

If it is also desired to utilize monthly area quotas, it is necessary to breakout the initial HSG DEP pool by Area.

vi) Initial Conditions: The Levels of Advertising and Recruiters in the Two Months Prior to Fiscal Year of Interest

The regression analyses have shown that recruiters and advertising have lagged effects so that the levels of Advertising and Recruiters in August and September , can affect the number of quality contracts obtained in the following months. Hence the Program can accept for the August and September months before the decision horizon of interest by Area:

i) the number of recruiters present, ii) the level of Classified Ads and iii) the level of all other Advertising. If these values are given, the Program will automatically modify the production functions in subsequent months to reflect these initial conditions. If no values are included, it will assume the values were the same as in August and September of 1978, prior to FY79. These were the following:

TABLE 2

Number of Recruiters Present (Initial Conditions for FY79)

	Area 100	300	400	500	700	800	TOTAL
Aug. '78	667	575	639	489	408	637	3,415
Sept. '78	649	574	634	491	414	626	3,388

Dollars of Classified Ads Spend (Initial Conditions for FY79)

	Area 100	300	400	500	700	800	TOTAL
Aug. '78	22.5K	19.6K	30.1K	19.6K	16.3K	24.9K	\$133K
Sept. '78	22.5K	19.6K	30.16K	19.6K	16.3K	24.9K	\$133K

Dollars of All other Advertising Spent except JADOR (initial
Conditions for FY79)

	Area 100	300	400	500	700	800	TOTAL
Aug. '78	78K	27K	63K	42K	32K	40K	282K
Sept. '78	88K	70K	92K	74K	61K	71K	456K

vii) Any Upper Limits on the Number of Quality Accessions that
can be Accepted by Month

The Program can accept upper bounds on the total number of quality shipments that can be accepted in any given month. These constraints reflect any capacity limits of the Recruit Training Centers. If no values are input, the Program defaults to a very high number so that in effect there is no limitation.

The second basic file is called the problem control file and deals with the number of years in the run, the type of run, i.e. budget generation, or budget execution, and the types of quotas of interest. To elaborate the program can be used in one of two modes: 1) to build the minimum yearly budgets required to meet given quotas on quality shipments and given terminal DEP pools, or 2) execute actual given budgets, one for advertising and one for recruiters, so as to minimize any shortfalls from a given set of quotas and DEP requirement. In terms of the quotas the user can focus on i) a single national, yearly quota, ii) 12 monthly, national quotas of iii) 72 area-monthly quotas. The terminal DEP requirement is a national one. The choice as to which type of quota is the focus is accomplished thru the use of different weights in the Program's objective.

3.2 Special Inputs for Budget Generation Mode

Consider first the budget generation mode, where the emphasis is on meeting, for each of the years in the decision horizon, national, yearly

quotas and terminal DEP requirements for each year. In this case the weight put on any monthly-national quotas, or on any area-monthly quotas will be zero. The only components of the objective function having any weight are those associated with the national, yearly quota, the final DEP requirement, and the so-called excess budget. The Program requires a gross upper bound for recruiter cost (in 1967 dollars) as well as an upper bound on advertising cost (in 1967 dollars). By putting large weights on the national quotas and the terminal DEP requirement, relative to that for the excess cost (i.e. weights of 1 for both the quotas and DEP requirements versus a weight of say 10^{-2} for the excess budget), the Program in the spirit of goal programming will first meet the quotas and DEP position and then minimize the cost to accomplish this. Detailed examples follow in Section 6.

If it is desired to generate the minimum budget to meet predetermined monthly, national quotas or even predetermined area-monthly quotas, as well as a final DEP requirement, a weight of 1 should be put respectively on the monthly quotas or the area-monthly quotas, a weight of 1 on the final DEP requirement, and a weight of 10^{-2} on the excess cost. The total minimum cost for meeting preset monthly quotas will in general be much larger than the cost resulting from utilizing a national, yearly quota. This follows since in order to guarantee that preset monthly or area-monthly quotas are met, the Program must allocate dollars in a manner so that the number of monthly shipments actually exceeds the monthly quotas. Any excesses over and above the monthly shipping requirements have cost money but are not able to reduce the monthly shipments quotas needed in later months. Possibly by trading off the weights or priorities given the national yearly quota versus that associated with meeting monthly shipping quotas, one can arrive at a satisfactory tradeoff.

To minimize these types of complication, it is strongly suggested that any budget generation runs utilize national, yearly quotas and terminal DEP requirements.

3.3 Special Inputs for Budget Execution Mode

Suppose instead that one is given the budget that one has to work with for a single year, together with any national yearly quota and a final DEP Requirement. Suppose one wishes firstly to minimize any national shortfall on the quota and secondly, to minimize any shortfall from the terminal DEP requirement. Then, one enters the pre-specified budgets (one for recruiters and one for advertising in 1967 dollars). Then one puts a large weight on the national yearly quota (say 1), a somewhat smaller weight on DEP requirement (say .1), and a small weight on any budget excesses. Then the Program will not spend more than the imposed budgets and will do so so as to first minimize the quota shortfall, and secondly to minimize the terminal DEP shortfall. If it can keep both shortfalls to zero within the allotted budgets, it will then minimize the amounts of money actually needed to accomplish this.

4.0 FACTORS USED BUT NOT INPUT BY USERS

There are a number of factors that are "hardwired" so that the user need not be concerned with them. These can be changed by entries to the so-called base file on say a yearly basis. These include, i) the earlier mentioned elasticities for recruiters and advertising and their lag patterns; ii) the factors which spread the DEP pool available at the beginning of the horizon over the next 12 months, iii) a 13 x 12 matrix called the delayed entry factors which is used to convert HSG or upper mental HSG contracts signed during the year to shipments or to the terminal DEP pool. This third is a matrix which depicts the proportion of enlistments signed in one month

¹The conversion factor e.g. from FY79 dollars to 67 dollars is to divide by 2.039.

TABLE 3

Male High School Senior Population and General Unemployment Rate for FY79

	Area 100	Area 300	Area 400	Area 500	Area 700	Area 800
No. of male High School Seniors for FY79	332,635	235,593	323,173	284,639	190,720	251,069
Monthly Unemployment rate						
Oct. 78	6.48%	5.56	4.90	4.01	4.45	5.54
Nov. 78	6.25	5.14	5.31	4.13	4.96	5.82
Dec. 78	6.06	5.28	5.42	4.50	4.88	5.97
Jan. 79	7.16	6.34	6.72	4.85	4.99	7.04
Feb. 79	7.09	5.75	6.78	4.71	4.50	6.86
March 79	7.08	5.50	6.22	4.64	4.30	6.42
April 79	6.03	5.11	5.85	4.16	4.29	5.98
May 79	5.81	5.12	5.22	3.77	4.29	5.46
June 79	6.61	5.74	5.88	4.49	4.88	5.80
July 79	6.83	5.95	6.08	4.21	4.78	5.89
Aug. 79	6.58	5.39	6.13	4.03	4.64	5.85
Sept. 79	6.62	5.39	6.01	4.08	4.59	5.79

TABLE 4: Other Demographics for

FY79

	Area 100	300	400	500	700	800
Propensity to Enlist	.224	.272	.2195	.1866	.2279	.2068
Labor Force Size (October, 1978)	18,577,000	11,652,000	18,096,000	12,954,000	9,508,000	16,003,000
Ratio of Military pay to Civilian pay (October, 1978)	.781	.930	.666	.687	.82	.724
Percent of male 17-21 year olds that are Black	11.14%	25.92%	13.84%	8.14%	15.4%	6.66%
Percent of male 17-21 year olds in SMSA	85.87%	58.63%	73.29%	61.46%	69.26%	81.81%

that actually ship a given number of months later. The matrix is included for completeness in Table 5. A final factor used is the attrition factor associated with the conversion of contracts to shipments, both from the initial DEP pool and from contracts signed during the year. This factor, initially set at 4.5% based upon estimates of the Recruiting Command, can be easily changed. Another factor is the overhead rates that are appropriate for the two types of advertising included in the analysis, namely LAMS advertising and all other advertising (except JADOR and RAD expenditures). The factors are presently set at 1 so that only the actual placement cost of the advertising is being calculated.

5.0 DETAILED EXAMPLE FOR BUDGET GENERATION MODE: Quota On High School
(FOR SINGLE YEAR) Graduate Accessions

5.1 Inputs

Consider the single year case for FY79 where the national, yearly quota input to the Program is equal approximately to that actually achieved in FY79, the same being true for the terminal DEP position requirement.

Hence the key inputs become:

- i) A total quota on male, non-prior service, active duty HSG shipments of 55,163; these are to come from the initial DEP pool at the beginning of FY79 plus those that sign a contract and ship sometime during the year.
- ii) A terminal DEP requirement, at the end of the fiscal year, of 10,041.
- iii) The economic and demographic scenarios are those shown in the Tables 3 and 4, which were applicable for FY79.
- iv) The initial size of the Delayed Entry Program for HSG recruits was 10,833.
- v) The yearly cost of a recruiter, including a prorated amount of RAD cost at \$1,104 per recruiter, is assumed to be \$26,009 in FY79 dollars.
- vi) The inflation factor, to convert FY79 dollars to 1967 dollars, is 2.039.
- vii) The attrition factor (in converting contracts from the DEP pool and from contracts signed during the year into shipments) is 4.5%.

TABLE 5 : DELAY FACTORS FOR SHIPMENTS OF HSG CONTRACTS

Delay in Months	0	1	2	3	4	5	6	7	8	9	10	11	12
JAN.	.3508	.1535	.0608	.0244	.0297	.0715	.0801	.0529	.0535	.1087	.0056	.0025	.0056
FEB.	.3167	.1667	.0671	.0408	.0787	.0782	.0754	.0667	.0352	.0543	.0047	.0023	.0130
MARCH	.2901	.1424	.0844	.0964	.0903	.0872	.0858	.0525	.0259	.0373	.0048	.0014	.0014
APRIL	.2919	.1617	.1285	.1007	.1019	.0701	.0575	.0330	.0220	.0264	.0018	.0016	.0005
MAY	.3980	.2019	.1156	.0721	.0598	.0507	.0317	.0141	.0240	.0265	.0016	.0014	.0025
JUNE	.4777	.1461	.0928	.0670	.0244	.0149	.0132	.0177	.0089	.0593	.0093	.0082	.0602
JULY	.4990	.1374	.1090	.0341	.0320	.0185	.0257	.0093	.0010	.0399	.0049	.0702	.0188
AUG.	.5088	.1063	.0968	.0439	.0326	.0270	.0122	.0580	0	.0363	.0773	.0232	.0295
SEPT.	.5320	.1530	.0531	.0336	.0372	.0206	.0136	.0068	.0016	.1129	.0114	.0052	.0042
OCT.	.4952	.1158	.0535	.0526	.0182	.0133	.0069	.0105	.0499	.1555	.0206	.0105	.0058
NOV.	.4517	.0966	.0909	.0281	.0186	.0114	.0215	.0704	.0490	.1456	.0155	.0066	.0019
DEC.	.3925	.1656	.0499	.0264	.0148	.0275	.0950	.0516	.0815	.0756	.0115	.0041	.0039

*EXAMPLE 35.08 percent of contracts signed in January will ship in January and
6.08 percent of the January contracts will ship 2 months later in March.

No attrition is applied to the terminal DEP requirement.

viii) The initial levels of Recruiters, LAMS advertising and all other Advertising (except JADOR expenditures) are those given earlier in Table 2, by Area, for August and September of 1978. The elasticities, lag patterns for advertising, LAMS and recruiters, are those generated from years 1976-1978 and validated for FY79.

5.2 Outputs of Computer Analysis for the Stated Set of Parameters: Examples of Actual Reports

There are a series of reports, made up of 2 National Summary Reports , one concentrating mainly on dollar flows, and the other on the optimal flows of HSG contracts and HSG accessions over time.

Consider the first Report, labled Report 1. We see that for the 12 months of FY79, the Program states that the total minimum costs needed would be \$89.7452 M (in FY79 dollars) and that this is divided between \$6.4303 M in Advertising and \$83.3149 M in recruiter (or 3,203.3 man-years of recruiters). This is to be compared with 3,405 man-years actually consumed. Note that the level of recruiting effort is constant for each month at \$6.9429 M since we forced the model to choose one optimal level of recruiters that it could not vary for the entire year. This is to reflect the reality that recruiters cannot be moved around, added or deleted over the short term except in small quantities. A control parameter in the problem control file enables the user to relax this restriction somewhat and allows recruiter variation to have more flexibility over time. Note also that the mix of advertising placement cost versus expenditures associated with recruiters was such that 7.4% of the total was for advertising. This agreed well with the 7.2% for the actual FY79.

Now consider the second part of Report 1. It shows first, for the country as a whole, the numberof HSG contracts (enlistments) being signed by month. (This was 56,972 on the Report). The flow of contracts over the 12 months may be useful for setting targets on contracts (as well as for accessions). The next number is the number of shipments coming from the initial delayed entry pool (less attrition). This is labeled Shipments from Initial Delayed Entry Pool and is the size of the initial DEP pool of 10,833 x .955 = 10,346.

Report 1: SUMMARY REPORT FOR 'LL AREAS (dollars)

Total for Horizon	Period	Period	Period	Period	Period	Period	Period	Period	Period	Period	Period	Period	Period
	1	2	3	4	5	6	7	8	9	10	11	12	
Advertising													
Total	\$6.4303M	.0188	.0864	.1215	.4289	.4005	.4169	.4162	.4410	.7707	.8952	1.2211	1.2132
Recruiting													
Total	\$83.3149M	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429	6.9429
Total	\$89.7452M	6.9617	7.0293	7.0644	7.3718	7.3434	7.3598	7.3591	7.3839	7.7136	7.8381	8.1640	8.1561

Report 1B

Total for 12 months

Oct. Nov. Dec. Jan. Feb. March April May June July Aug. Sept.

HSG

Contracts 56,972 3,545 4,037 4,060 5,632 5,922 5,593 4,110 3,837 4,914 4,840 5,526 4,955

Total Shipments from Initial DEP pool

10,346 3,119 1,344 1,033 838 446 745 299 310 1,694 289 207 21

Total

Accessions 55,166 4,782 3,475 3,108 3,895 3,407 3,784 2,842 3,471 7,334 6,337 6,751 5,960

Quota

55,163 - - - - - - - - - - - - -21-

Terminal DEP pool (without attrition) 10,042

The row labeled accessions is the number of shipments for the year in question both from the initial DEP pool and from contracts signed during the year; it has had the attrition taken out. These quantities by month are the theoretically optimal national goals for male, non-prior service HSG shipments (active duty plus reservists). This should be at least equal to the total quota on shipments. The number in our case is 55,166 where the quota was 55,163. Finally the total size of the terminal DEP pool, without attrition applied, is 10,042 (the same as the terminal DEP requirement). If one looks at months 13-24 for the row labeled terminal DEP, we have the anticipated flow of shipments from the terminal DEP pool for the next year (less attrition). This information is used if a budget generation run is also desired for the succeeding year since one of the key inputs to next year is the flow of shipments from the DEP pool at the beginning of the year. In our case, this anticipated flow of shipments from the DEP pool as of September 30, 1979 would be as follows:

Oct. 79	Nov. 79	Dec. 79	Jan. 80	Feb. 80	March 80
3,083	1,457	873	783	433	398
April 80	May 80	June 80	July 80	Aug. 80	Sept. 80
270	270	1,557	265	181	20

This is a total of 9,590 and results from the terminal DEP requirement of 10,041 multiplied by the non-attrition factor of .955. Finally at the bottom of Report 1 are any shortfalls from the quotas. Note that there will only be shortfalls in a budget execution run and not in a budget building run. Hence to summarize, the above information would enable the Recruiting Command to do goaling by month for the entire country, not just on accessions but on contracts as well. These results, together with the initial distribution of the DEP pool, could also be used for setting DEP targets by month by area.

Consider next Report 2 which summarizes down the accessions and contracts by Area, by month. The second half of the report breaks down optimally the

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

	PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4	PERIOD 5	PERIOD 6	PERIOD 7	PERIOD 8	PERIOD 9	PERIOD 10	PERIOD 11	PERIOD 12
TOTAL FOR HORIZON	14.5007	0.9167	1.0410	1.0435	1.4346	1.5210	1.4466	1.0492	1.2587	1.2423	1.3804	1.2737
ENLISTMENTS FOR REGION 1	14.6676	0.9015	1.0258	1.0407	1.4750	1.5250	1.4392	1.0598	1.2771	1.2618	1.3866	1.2775
ENLISTMENTS FOR REGION 2	10.4256	0.6338	0.7267	0.7303	1.0351	1.1023	1.0330	0.7623	0.9003	0.8890	0.9959	0.9141
ENLISTMENTS FOR REGION 3	3.2476	0.7172	0.2381	0.2391	0.3168	0.3367	0.3195	0.2338	0.2797	0.2712	0.3011	0.2781
ENLISTMENTS FOR REGION 4	8.0880	0.4797	0.5623	0.5622	0.7838	0.8182	0.7726	0.5761	0.5425	0.4811	0.5097	0.7038
ENLISTMENTS FOR REGION 5	5.9540	0.3962	0.4427	0.4439	0.5869	0.6188	0.5817	0.4286	0.5025	0.4449	0.5527	0.5081
TOTAL (1030*5)	56.9716	3.5450	5.0368	5.0598	5.6322	5.9220	5.5926	4.1099	4.9144	4.8403	5.5264	4.9552
ACCESSIONS FOR REGION 1	13.341	0.9496	0.7805	0.7190	0.9319	0.8443	0.9166	0.7060	1.7498	1.6038	1.6906	1.5252
ACCESSIONS FOR REGION 2	13.634	1.0540	0.8129	0.7397	0.9630	0.8602	0.9341	0.7165	1.8023	1.6250	1.7118	1.5338
ACCESSIONS FOR REGION 3	10.546	1.0049	0.6888	0.6079	0.7472	0.6518	0.7303	0.5382	1.4178	1.1745	1.2377	1.0959
ACCESSIONS FOR REGION 4	3.769	0.4648	0.2832	0.2430	0.2728	0.2214	0.2805	0.1794	0.5201	0.3781	0.3910	0.3377
ACCESSIONS FOR REGION 5	7.403	0.5497	0.4357	0.3949	0.5113	0.4595	0.4575	0.3843	0.9674	0.8757	1.0027	0.8512
ACCESSIONS FOR REGION 6	6.470	0.7187	0.4637	0.4031	0.4684	0.3896	0.4449	0.3173	0.8769	0.6795	0.7090	0.6169
TOTAL (11000*5)	55.163	4.7816	3.4748	3.1077	3.8946	3.4268	3.7840	2.8418	7.3343	6.3368	6.7508	5.9603

national accession quota by Area, i.e. 13,341 shipments from Area 1 (100), 13,634 from Area 2 (300), 10,546 from Area 3 (400), 3,769 from Area 4 (500), 8,802 from Area 5 (700), and 6,470 from Area 6 (800). In addition this report breaks down the terminal DEP by Area. The 10,041 is made up as:

	Total	Area 100	300	400	500	700	800
Ideal Terminal							
DEP as of	10,041	2,560	2,583	1,841	562	1,465	1,030
September 30,							
1979							

The other Reports 3 - 8 are all area specific and depict the same types of information by area. A representative report for Area 100 is included (Report 3).

5.3 Comparison of Actual Levels of Theoretically Ideal Levels of FY79

The following Tables are included which compare to actual levels attained in FY 79 to the theoretical levels with perfect foresight.

[illegible]

Comparisons, by Area for FY79, of Resources and HSG Contracts Between Actuals and Theoretically Optimal Levels

	Actual # of HSG Contracts	Optimal # of HSG Contracts	Actual # of Recruiter Man-Years	Optimal # of Recruiter Man-Years	Actual Level of Dollar Advertising	Optimal Level of Advertisin
Area 100	12,127	14,589 (20.3% more)	659	817.2 (24% more)	\$1,456K	\$1,870 K (28.4% more)
Area 300	10,869	14,668 (34.9% more)	586.8	824 (40.4% more)	\$1,060K	\$1,860K (75.5% more)
Area 400	10,836	10,426 (3.9% less)	645.8	587.3 (9.1% less)	\$1,484K	\$1,310K (11.7% less)
Area 500	6,363	3,248 (48.9% less)	487	179.6 (63.1% less)	\$1,125K	\$ 436K (61.2% less)
Area 700	6,995	8,088 (15.6% more)	426.3	466.7 (9.5% more)	\$ 860K	\$ 934K (8.6% more)
Area 800	9,844	5,954 (39.5% less)	600.2	328.4 (45.3% less)	\$1,129	\$ 806K (28.6% less)
Country as Whole	57,034	56,973	3,405	3,203 (5.9% less)	\$7,114K	\$6,430K (9.6% less)

Hence we notice that the major differences are:

- i) Area 100 and Area 300 appear to warrant substantially more resources and would then produce substantial increases in quality enlistments.
- ii) Area 400 is about on target as is Area 700.
- iii) Areas 500 (Chicago) and 800 (Far West) both appear to be substantially overstaffed and, while it is true that the reduction of resources in those Areas will lower production in those Areas, the gains from putting those resources in other Areas more than offsets the losses.

COMPARISONS BY MONTH FOR ENTIRE COUNTRY OF DISTRIBUTION OF ADVERTISING AND HSG
CONTRACTS BETWEEN ACTUALS AND THEORETICALLY OPTIMAL LEVELS

	Actual HSG Contracts	Optimal Flow of HSG Contracts	Actual Percent of Advertising Expenditures	Optimal Percen of Advertising Expenditures
October 1978	3,880	3,545 (8.6% less)	16.5%	7.2%
November 1978	3,735	4,037 (8.1% more)	12.4%	8.3%
December 1978	4,342	4,060 (6.5% less)	1.5%	8.3%
January 1979	5,294	5,632 (6.4% more)	11.2%	9.9%
February 1979	4,617	5,922 (28.3% more)	13.8%	9.9%
March 1979	4,891	5,593 (14.4% more)	16.4%	9.2%
April 1979	4,008	4,109 (2.5% more)	7.0%	7.3%
May 1979	3,985	3,837 (3.7% less)	7.9%	6.9%
June 1979	5,339	4,914 (8.0% less)	2.7%	8.4%
July 1979	5,394	4,840 (10.3% less)	7.9%	8.1%
August 1979	6,291	5,526 (12.2% less)	8.3%	8.9%
September 1979	5,102	4,955 (12.9% less)	8.1%	7.5%
TOTAL	56,897	56,973	100 %	100 %

The difference in allocations are due in part to the size of the DEP pool at the beginning of the year, but more to economic efficiencies where resources are allocated to those Areas with the highest yield per dollar spent. Because of unfavorable demographics*associated with "propensity to enlist" (Areas 500 and 800 have the lowest of the 6 Areas), ratio of military pay to civilian pay (Areas 500 and 800 are among the lowest for this measure, i.e., .687 and .724 compared to .93 for Area 300, for example), and percent of 17-21 year old males who live in an urban area (i.e., Area 500 is only 61.5% compared to 85.9% for Area 100), Areas 500 and 800 have intrinsically a lower yield, in terms of HSG contracts per dollar expended than some of the other areas and appear not to merit the magnitude of resources that has been typically allocated to them in the past.

* See Table 4

6.0 DETAILED INPUT FORMATS AND USE IN MULTI-YEAR PLANNING

6.1 General Considerations

As mentioned earlier, there are three input files for executing the Program. The first is the Base File and will not normally require any changes or additions by the user. There are two versions of the base files, one for focusing on HSG recruits, and one for focusing on Upper-Mental HSG recruits. The base files sent to the Naval Recruiting Command in October, 1981 enabled the Recruiting Command to easily make runs for outyears, while inputting only a few key demographics related to size of eligible population and unemployment rates. The base file will automatically compute the modified production function coefficients, given changes in demographics from the base year of FY79. The Program will not run without this base file; hence one of two decks of cards, one representing the FY79 base file to be used for HSG recruits and the other, the FY79 base file to be used for Upper Mental HSG recruits, will need to be loaded prior to running the Program.

The detailed formats for the base file follow with some comments. The order of the cards is not important but if the labels are missing, the Program will abort.

The second is what we shall term the Scenario File. It contains label cards containing the various demographic inputs, by Area by month, for the Fiscal Year of interest. The items dealt with include the male High School senior population, unemployment rate, and others. If the user chooses to enter nothing on a given label card, the Program will default to the levels existing in FY79; these have been earlier presented, (see Table 3 and 4).

This scenario file is used to construct the 72 non-linear enlistment contract production functions, for each of the fiscal years, to be manipulated in the optimization. These 72 non-linear production functions capture differences in the number of quality contracts that would be obtained, across different areas and different months, if the same stream of recruiter resources and advertising resources were expended. This file is described subsequently in detail.

The third file is the so-called Control File with only three cards. It controls the mode of the Program, e.g., fiscal year under analysis, budget generation versus budget execution, constraints on recruiter allocations, the types of quotas to be concentrated on, etc.

The fourth and last file is known as the Results File, has four cards, and plays an important role in the multi-year planning mode. This file initializes the problem (in terms of the assumed or actual number of recruiters and advertising levels in the field prior to the fiscal year of interest) as well as the size of the initial DEP pool by Area. The detailed formats will follow subsequently.

6.2 Use in Multi-Year Planning: An Illustration

The user of this package can perform, for either HSG or Upper Mental HSG accession quotas, budget generation runs for a period of up to five years. The code automatically taking into account the coupling or interactions between the years in question. This interaction arises because of the lagged effects of recruiters' efforts and advertising (where advertising expenditures incurred several months ago may affect the number of

enlistment contracts attained this month); the other interaction is the size of the Delayed Entry Pool.

This interaction is best understood by appreciating that a set of low quotas for one year has its impacts on the enlistments signed early in the next year since the low quotas influence the numbers of recruiters in the field, the dollars of advertising and the numbers in the DEP pipeline. The procedure for a multi-year budget generation is as follows:

- 1) The user inputs the demographic scenario for the first year of interest, e.g., FY 83. If he inputs only the size of the male High School senior population and the assumed unemployment rate (the key two demographics), the Program will automatically utilize the FY 79 levels for the minor demographics related to "propensity to enlist," "percent black," and "percent urban." Note that based upon his interest in HSG accessions or Upper Mental HSG accessions, the user selects one of two basic files to be used. He also inputs initial conditions as to the size of the DEP pool at the beginning of the FY and the initial levels of recruiters and advertising. See the format of the "Results File" for details.

- 2) The user then inputs the quotas, the size of the ending DEP pool, cost of a recruiter man-year, etc. for a one year run.

- 3) The program is run for the first year with detailed outputs related to the budgets required, optimal flow of enlistments, split of budget, etc., for the first year. Also a temporary file and a batch of cards is automatically produced to replace the old "Results File", i.e., to produce initial

conditions for the second fiscal year.

4) If the user is interested in the budget generation run for the second year, together with the impacts of the first year's decisions on the second year's production, he can initiate a second year's run. To do this he enters the demographics for the second year (as before) and the quotas and the terminal DEP position desired at the end of the second year. The user does not have to enter the initial conditions for the second year on the "Results File" as before as these are created automatically by the Program and entered in the appropriate place. If it is desired to say make a five year run and if only 1 year of scenario data is included, the Program automatically utilizes the first year's scenario for the second, third, fourth and fifth years. The advantage of this scheme is that the user can inspect the results of the first year before continuing into the second year. If the budget results for the first year are not feasible or palatable, the run of the subsequent year's results, which are dependent on the terminal conditions of the first year's run, can be terminated. Hence, in summary, if the user wishes to run several years in sequence to obtain insights as to the interactions of results over several years, the hard part of the effort, (namely the transfer of last year's terminal conditions to the next year's initial conditions) is accomplished by the computer.

An example covering two years will be shown in Section 6.7.

6.3 THE BASE FILE LAYOUT

Columns 1-6 (Label)			Year Information		13-72		Notes	
			7-8 (fiscal)	9-10	11-12	Description		
SIZE	*IMAX JMAX VMAX TMAX LMAX NMAX				(614)			
A	0	0	0	0	J (1-2)	Sum of Delay Fractions for each month (7F8.3)	(This is card 1 in Base File and sets the maximum size problem that can be addressed in terms of areas, number of months, etc.)	
ALPHA	0	0	0	0	J (1-3)	Elasticity for Recruiters, and each adv. type for given lag (3F8.3)	(There are two cards with 12 pieces of information (one for each month) dealing with the attrition from contract signing to shipment. These are currently at .955 for all 12 months, representing 4.5% attrition rate.)	
ANAME	0	0	0	0	name of Adv.	Name of Advertising Type (2A8)	(These are names of any breakouts of Advertising used).	
B	0	0	0	0	J (1-2)	Elasticity related to Prod. Fun. Values (7F8.3)	(These are the elasticities for the 8 demographic variables utilized.)	
BBLK	0	0	0	0	J (1-14)	Proportion of Blacks for base year for month J for each of the six areas (6F8.3)	(This is a sequence of 14 cards, 1 for each month of base year (FY79) including 2 months lags; each card has 6 entries, one for each Area.)	
BENL	0	0	0	0	J (1-14)	Propensity (6F8.3)		
DESCRIPTION							Values for this problem	
* IMAX							6	
JMAX							12	
VMAX							13	
TMAX							24	
IMAX							3	
NMAX							2	

continued

ETA	0	0	J (1-2)	Delay Fractions (7F8.3)	(There are 2 cards for each month, depicting the 13 delay factors corresponding to the percent of contracts signed in a given month that ship x months late (x=0, 1...12)
BUSSR	0	0	J (1-14)	High School male senior population (6F8.3)	(This is a sequence of 14 cards, 1 for each month of base year (FY79) including 2 months lags; each card has 6 entries, one for each Area.)
BLAB	0	0	"	Labor Force in thousands (6F8.3)	"
BP	0	0	J (1-12)	Base year Pij (6F8.3)	(This is a sequence of 12 cards, 1 for each month of base year (FY79) including 2 months lags; each card has 6 entries, one for each Area.)
BPAY	0	0	J (1-14)	Pay Ratios (military pay to civilian pay)	(This is a sequence of 14 cards, 1 for each month of base year (FY79) including 2 months lags; each card has 6 entries, one for each Area.)
BUNE	0	0	"	Unemployment Rate (6F8.3)	"
BURB	0	0	"	Proportion Urban (6F8.3)	"
BUPMN*	0	0	"	Percent of High School Seniors rated Upper Mental (6F8.3)	"
DEPATT	0	0	0	Dep Attrition Factor (F8.3)	(single entry at .045 currently)
ENDPCT	0	0	J (11-12)	Min. % Total Advertising for Period J for each type of adv.	(These parameters enable us to add constraints for each of the types of advertising by month).

*These cards are included in the deck only when the upper mental category contracts are analyzed.

continued

GROW	0	0	0	0	Inflation Factor	(This is a parameter representing the value of dollars, relative to 1967, for the year dollars desired. If it is FY79 dollars, this parameter is 2.039).
LAMBDA	0	0	0	0	Koyck Term (F8.3)	(Single number representing Koyck value from regression used to produce new set of Pij).
RECAWT	0	0	0	0	Monthly Recruiter Cost (in 1967 dollars) (F8.3)	(Single number representing Recruiter cost per month in 1967 dollars.)
SCALE	0	0	0	0	Overhead Rates for each type of advertising	(There rates are currently at 1 and hence only placement cost being calculated) The first overhead rate is for LAMS and the second for all other advertising, for RAD, and JADOR.
DEPF	0	0	0	J (1-2)	Final DEP (7F8.3)	(There are twelve numbers for final DEP desired, and represent the number of shipments, (from contracts signed the year before) in thousands, desired for each month of the subsequent year for the type of recruit under analysis. If the only real requirement is for a given size DEP pool at the end of the year (and not when those shipments actually come in), then it does not matter what numbers are inputted here since they will not be used.

6.4 THE SCENARIO FILE LAYOUT

Columns 1-6
(label)
7-8 (fiscal
year information)

9-10 11-12
Description

Notes

DEPQ	79	0	0	Dep Target (F10.6)	(A single number for the national terminal Dep desired.)
ENLST**	78 or 79	0	J (1-14)	Propensity (6F8.3)	There are 14 cards (one for each month, including lag periods). 6 entries on each card for each of the Areas.
HSEN**	79	0	J (1-26)	High School seniors demographic (7F8.3)	There 14 cards (one for each month), each card has HS senior males by Area.
LABOR**	78 or 79	0	J (1-14)	Size of Labor Force (in thousands) (6F8.3)	"
PAYRAT**	"	0	"	Ratios of Military pay to civilian (6F8.3)	"
PBLACK**	79	0	"	Percent Black (6F8.3)	"
PURBAN**	79	0	"	Percent Urban (6F8.3)	"
UNEMP**	79	0	J (1-26)	Unemployment Scenario (7F8.3)	There are 26 cards, each card has general unemployment scenario by Area. (These rates are multiplied by 100).

** The number of cards for demographic variables depends on the number of years under consideration. There are 14 cards for 1 year, 26 cards for 2 years, 38 cards for 3 years, 50 cards for 4 years and 62 cards for 5 years. If the variable values are not entered, they default to FY79 levels.

continued

UPMEN**	79	0	J (1-14)	Percent of High School senior rated Upper Mental (6F8.3)	There are 14 cards (one for each month, including lag periods) 6 entries on each card for each of the Areas.
Q	79	0	J (1-4)	National Monthly Accession quotas (7F8.3)	These are the 24 monthly national quotas.
QR	78 or 79	0	J (1-12)	Area Accession quotas by month (6F8.3)	These are the 72 are-monthly quotas. Each card represents a a month with 6 entries on it (for each Area).
QUP	79	0	J (1-4)	Upper Limits on accessions by month (7F8.3)	Reflects any constraints on Recruit Training Centers
TOTALQ	79	0	1	Total Accession quota for year (F8.3)	Single Number

**The number of cards for demographic variables depends on the number of years under consideration. There are 14 cards for 1 year, 26 cards for 2 years, 38 cards for 3 years, 50 cards for 4 years and 62 cards for 5 years. If the variable values are not entered, they default to FY79 levels.

6.5 THE CONTROL FILE LAYOUT

Columns	Description	Notes
The first card is:		
1-5	PARMS	
6-12		
13-15	Fiscal year under study (I3)	
16-18	1 or 2 (I3)	Always use a 1 where the delay factors are not considered as decision variables
19-26	Budget for recruiting in millions dollars (1967 dollars) (F8.1)	In a budget generation mode, put in upper bound of 76. In a budget execution mode, put available budget in 1967 dollars.
27-34	Budget available for all advertising (millions in 1967 dollars) (F8.1)	If using budget generation mode put in 5.5.
35-39	Percent decrease in recruiters per period allowed (F5.1)	<u>This should be set at 0 and if varied, allows numbers of recruiters to vary over year.</u>
40-44	Percent increase in recruiters per period (F5.1)	<u>This should also be set at 0.</u>
45-47	Budget types enter a 0 or a 1	0 if separate budgets are of interest, and 1 if combined budget is of interest. (I3)
The second card is:		
1	W	
7-8	79	
11	0	
12	0	
13	Objective function weight (7F8.3)	The first is weight on national, yearly quota; second on final DEP, third on national monthly quotas, fourth on dep-monthly quotas (i.e., how they come in over time), fifth on area-monthly quotas, the sixth on upper bound constraints and the seventh on excess budget. (In a budget generation mode put a 1 on national quota, 1 on terminal DEP request, and a .1 on excess budget).
The third and last card is:		
1-3	END	

6.6 THE RESULTS FILE LAYOUT

Columns				Description	Notes
1-6	7-8	9-10	11-12		
X0	78	0	0	Initial level of recruiters in Sept. (in thousands) (6f8.3)	This card contains for each of the 6 areas the number of recruiters present in the September prior to the year of interest.
Y0	78	L (1 or 2)	N (1 or 2)	Initial levels of advertising as of Aug. and Sept. of each type by area. (6f8.3)	This sequence contains 4 cards, one card for each lag and each type of advertising. (Each card has 6 entries, one for each area). If no information entered, program defaults to August and September of 1979.
DEPR	78	0	0	Initial DEP by area (6f8.3)	This contains the size of the unattrited DEP pool by area.

6.7 Illustration of a Two-Year Budget Generation Run for HSG Accessions

The following are the actual computer inputs and outputs for a Two-Year run (in a budget generation mode) for FY79 and FY80 for HSG accessions. The following are the actual files for the Control, Base, Scenario, and Results file. Consider the Control File, the first file shown. The first year in question is FY79, the first entry in the file. The second factor controls whether or not the delay factors (in the DEP Program) are to be decision variables or not. The Program is normally run with a "1" which means the delay factors are not controllable. The next two factors are used to facilitate the budget generation run. They are gross upper bounds of the recruiting costs (\$79.5 million in 1967 dollars) and \$6.0M for the advertising costs (in 1967 dollars). Note the recruiting costs include RAD costs and the advertising costs are only the advertising placement costs at the moment. When overhead factors become available for advertising, the Program has the capability of accepting it and hence outputting a more complete advertising costs. If the quotas of interest were much higher than those used in this run (i.e., 54,642 HSG accessions in FY79 and a terminal DEP for HSG recruits of 10,041) then these upper bounds should be increased. The next two entries are both 0 and are options afforded the user to allow the number of recruiters to vary over the year. Typically, we do not allow the flexibility so the factors are set to 0. The last 0 relates to a single budget or distinct budgets that cannot be comingled. The "0" signifies that distinct budgets, one for recruiting and one for all advertising, are of interest.

ACTUAL CONTROL FILE
NAVY RECRUITING COMMAND
RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION
LISTING OF INPUT DATA
=====

PROBLEM PARAMETERS:

79 FY MODER
1 79.50 BUD1
6.00 BUD2
0.0 PCILO
0.0 PCITH
0 IBTYPE
=====

FISCAL YEAR
TYPE OF DELAY FACTORS TO USE
TOTAL RECRUITING BUDGET
TOTAL ADVERTISING BUDGET
LIMIT ON RECRUITER GROWTH PER PERIOD (%)
LIMIT ON RECRUITER GROWTH PER PERIOD (%)
TYPE OF BUDGET CONSTRAINTS
=====

PROBLEM SIZE VALUES:

6 IMAX
12 JMAX
13 VMAX
24 LMAX
3 NMAX
=====

NUMBER OF REGIONS
NUMBER OF TIME PERIODS
NUMBER OF TIME PERIODS ENTRY MAY BE DELAYED AFTER ENLISTMENT
NUMBER OF TIME PERIODS (INCLUDING POST-HORIZON)
NUMBER OF LAGGED PERIODS FOR PRODUCTION FUNCTIONS
TYPES OF ADVERTISING
=====

The next information shown on the printout is the Problem Size card. (Note the cards do not have to be in any given order as the "Label" in columns 1-6 tells the type of information being entered; hence if the input cards are dropped and reshuffled it does not affect the workings of the Program.) These parameters shown control the parameters for this run. In general the user will not change these. They are:

IMAX = 6 (the number of recruiting Areas), JMAX = 12 (the number of time periods, i.e., months in a year), VMAX = 13 (the number of periods for the delayed entry program where month 0 represents the direct shipment mode), TMAX = 24 (the total number of months whose accessions are affected by contracts signed in FY79 due to the Delayed Entry Program, LMAX = 2 (relates to the lag pattern of advertising and recruiters where advertising expenditures two months earlier effect HSG Contracts attained in this month), NMAX = 2 (relates to the disaggregation of advertising types).

The econometric analysis for the calendar years 1976-1979 found a real distinction in the elasticity impacts of LAMS advertising and all other advertising so that it only disaggregated these two. When more information as to the separate impacts of TV/radio, magazines, direct mail, Minority Advertising, JADOR, etc. are available, it can be easily accommodated in the Program.

Consider now the Base File, dealing with the core information as to the delayed entry delay factors, attrition, elasticities, and demographics for FY79. Recall there are two distinct base files, one

NAVY RECRUITING COMMAND

[illegible]

陳陳林林鴻鴻南南陽陽楚楚

041000Z APR 74 : 000000Z APR 74 : 000000Z APR 74

to be used for HSG runs and a separate one for Upper Mental, HSG runs.

The one being displayed is for a HSG run. The only numbers in this file that need to be changed^{*} by the user are:

1) The factor labeled GROW shown at 2.039. It represents the cost of living index for the year of interest, relative to the year 1967. Since the run being shown is for FY79, the factor (obtained from the Department of Commerce publications) was 2.039. This is an important factor since the outputs are all calculated in the dollars of the year in question. Hence if a budget run for FY83 is desired, then an estimate of the cost of living index for FY83 is needed.

2) The factor labeled RECAMT, shown at 1.063. This represents the monthly recruiters costs (including RAD materials) in 1967 dollars in thousand of dollars. Hence the 1.063 represents \$1,063 as the monthly recruiter costs in 1967 dollars or about \$26,009 per year in FY79 dollars (i.e., $\$26,009 = \$1,063 \times 12 \times 2.039$). Hence for a run in FY83 it is necessary to estimate the monthly costs in FY83 dollars and then convert that to 1967 dollars. (Note: it is important that the Recruiting Command be clear on which types of costs to include in this figure, i.e., does one include retirement, benefits, etc. or simply salary. At present we have estimated salary (exclusive of benefits) plus support costs).

3) The two factors labeled SCALE shown at 1.0 and 1.0 are the overhead factors, when available, to be applied to the two types of advertising placement expenditures used, i.e., LAMS and all other advertising (exclusive of RAD and JADOR). Since a factor of 1.0 is being used, only the placement costs are being calculated and this underestimates

* The earlier factors shown are respectively: A (the monthly attrition factors), ALPHA (the elasticities for recruiters and the two types of advertising for 3 months), B (the elasticities for the 8 demographics included), BETA (the delay factors associated with the DEP Program), BHSSR (the number of High School seniors in FY79), BLAB (the size of the labor force in FY79), BP (the enlistment propensity in FY79), BPAY (the pay ratio in FY79), BUNE (the unemployment rates in FY79), and BURB (the urban-rural split in FY79).

15362-879

[illegible]

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION SCENARIO FILE (CONTINUED)

PAYRA17900	9	0	77938	0	67799	0	68289	0	83387	0	71988	0	0000630
PAYRA17900	8	0	77942	0	66931	0	67495	0	82824	0	71155	0	0000640
PAYRA17900	9	0	75828	0	66930	0	67020	0	82224	0	71053	0	0000650
PAYRA17900	1	0	75828	0	66931	0	66836	0	81163	0	69986	0	0000660
PAYRA17900	1	0	75828	0	66931	0	66836	0	81163	0	69986	0	0000670
PAYRA17900	1	0	75828	0	66931	0	66836	0	81163	0	69986	0	0000680
PAYRA17900	1	0	75828	0	66931	0	66836	0	81163	0	69986	0	0000690
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000700
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000710
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000720
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000730
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000740
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000750
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000760
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000770
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000780
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000790
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000800
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000810
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000820
PBLACK7900	1	0	10895	0	33586	0	08019	0	15095	0	06419	0	0000830
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000840
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000850
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000860
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000870
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000880
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000890
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000900
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000910
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000920
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000930
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000940
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000950
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000960
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000970
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000980
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0000990
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001000
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001010
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001020
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001030
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001040
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001050
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001060
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001070
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001080
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001090
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001100
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001110
PURBAN7900	1	0	84064	0	23232	0	06003	0	55989	0	81659	0	0001120

SCENARIO FILE (CONTINUED)

-49

the true costs of advertising. Hence in the tradeoffs between recruiter expenditures and advertising, the advertising is being given an unrealistic advantage. On the other hand, the recruiter costs at \$26,009 per year in FY79 dollars is most likely an underestimate also, so they may tend to balance out. The last factors shown are the DEPF and are included as an option if it is desired to control the flow of shipments, coming out of contracts signed the year before. In most cases a requirement on the final DEP pool at the end of the year will suffice and so these 12 numbers are not needed, i.e., any numbers can be inputted as they will not be used.

Next consider the Scenario File. The key factors that need to be addressed by the user for this file are:

1) The factor labeled DEPO, shown at 10,041. This is a key number and relates to the required size of the DEP pool (for the category of recruits being considered) wanted at the end of the year. For the run in question, this was set at 10,041 HSG recruits, which was about the number that actually did result.

2) The factor labeled HSSSEN related to the number of male High School seniors for the year in question. These were needed by Area for each of the 14 months, i.e., the 12 months of the horizon plus the 2 months prior to the year of interest. These numbers are in actuals. Hence to illustrate, the number of male High School seniors for Area 100(i.e., Area 1) for August, 1978 (2 months prior to the beginning of FY79) was 330,363. If these factors are not put in, the Program will use the FY79 demographics. (Note: For the base file used for Upper Mental, HSG accession runs, there is an entry called UPMEN which is the percent of male High School seniors (i.e., fraction of HSSSEN which are bright, i.e., Upper Mental, or in categories I-III Upper Mental on the AFEES exam).

3) The size of the Labor Force(labeled LABOR), in the same form as male High School seniors, for the 4 months by Area. This is entered in thousands. Hence to illustrate, the size of the labor force in Area 1, August 78 was 18,004,000. Once again, if these values are not entered, the Program will default to FY79 levels.

4) The factors labeled PAYRAT, or the ratios of first year military pay to civilian parties by Area by month. Again, if these values are not entered, the Program automatically defaults to the FY79 levels.

5) The factors labeled UNEMP refers to the general unemployment rates (multiplied by 100) for each Area for each month. Hence for Area 1, August 78, the general unemployment rate (obtained from Department of Commerce statistics) was 7.2595%. (Note: Those factors which have the biggest impact on the contract production functions are: High School seniors and unemployment rates. Hence it is suggested that most of the other values can be omitted (i.e., default to the FY79 levels) and the new scenarios concern themselves only with these two demographics.)

6) Consider the problem of quotas: the Program can accept monthly, national quotas on accessions (i.e., Q's for 24 months), area-monthly quotas (i.e., QR's for 24 months by Area) or a single quota of the entire year over the nation (i.e., TOTALQ). Which of these quotas is to be the driving factor in the run is controlled by a card in the Control File to be discussed subsequently. If the single national, yearly quota is the one of interest, it does not matter what numbers are entered in Q and QR, except for the fact that the monthly shortfalls* are computed on the basis of the monthly Area quotas or monthly-national quotas.

* These are shown at the bottom of the computerized reports as will be seen.

For the run in question, the run was driven by the single quota for FY79 of 54,642 HSG accession (from the initial DEP plus from new shipments).

Consider next the key control card (in the Control File) labeled W. This card has seven key entries and essentially determines the quotas and terminal DEP positions required. A "one" in the first and second columns puts the entire emphasis on meeting the single national, yearly quota on HSG accessions and on the meeting the required DEP position at the end of the year for HSG recruits. The .1 in the last column assures that this will be accomplished at least total cost.

Finally consider the so-called Results File. This initializes the problem for the first year and is also the place where the Program, in a multi-year mode, reports the terminal conditions for the first year (which becomes the initial conditions for the second year). The first card deals with the assumed initial recruiters in the field by Area prior to the beginning of the FY of interact, the dollars of advertising of the two types in August and September and initial DEP positions by Area at the beginning of the Fiscal Year. Note this total is the 10,833 HSG recruits in the DEP pool at the beginning of FY79.

This completes the listing of the inputs for the first year. The Program then produces the following reports: Note that the total cost is \$89.7746 Million with \$6.4327 Million for all advertising and \$ 83.3419 Million for recruiters (this is 3,204 recruiters). Also note the level of accessions is 54,798 (compared to the 54,642 required), and that 10,345 of these came from the initial DEP of 10,833, less the attrition of 4.5%. Also note that 56,589 new HSG contracts were obtained, leaving a

RECRUITING/ADVERTISING COMMAND OPTIMIZATION
 LISTING OF INPUT DATA
 RESULTS FILE FOR BEGINNING OF FY79, HSC1)

	780000	650	574	636	490	411	631	00000010
X0	78 1 1	.0225	.0196	.0301	.0196	.0163	.0249	00000020
Y0	78 1 2	.0225	.0196	.0301	.0196	.0163	.0249	00000030
Y0	78 2 1	.0780	.0370	.0230	.0420	.0320	.0400	00000040
Y0	78 2 2	.0880	.0700	.0520	.0740	.0610	.0710	00000050
JEPR	780000	1.942	2.192	2.458	1.261	1.129	1.851	00000060
END	78							00000070

READING OF INPUT DATA COMPLETE.

MATRIX GENERATION COMPLETE
 1006 CARDS WRITTEN TO SCRATCH FILE NUMBER 12

54

RECRUITING/NAVY RECRUITING COMMAND COPY INITIATION (HSG-2, FY79)

	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR INITIATION	6.4327	0.0101	0.0058	0.1216	0.4291	0.4172	0.4164	0.4413	0.7711
ADVERTISING	0.37479	0.9452	0.9452	0.9452	0.9452	0.9452	0.9452	0.9452	0.9452
RECRUITING	0.97746	0.9632	0.0310	0.0667	0.3743	0.3623	0.3616	0.3864	0.7163
TOTAL COST (BILLION \$)	7.41025	1.9762	0.9862	1.0119	1.2934	1.2795	1.3080	1.3277	1.6575
CONTRACTS	56.5889	3.2903	3.8959	4.0606	5.4337	5.5942	5.1110	3.8380	4.9157
INITIAL DELAY ENTRY POINT	10.3458	3.1263	1.3668	1.0346	0.8380	0.7449	0.3000	0.3104	1.6863
ACCESSIONS	44.9531	1.9931	2.5291	3.0260	2.9734	3.0342	2.5604	3.1555	5.6200
TOTAL ACCESSIONS	54.7286	4.8673	3.3872	3.0833	3.8102	3.1791	2.8404	3.4658	7.3063
QUOTAS	63.0630	5.7710	4.0750	3.5430	4.9390	3.9490	3.8170	4.1990	7.0300
SHORTFALLS	0.5407	1.1039	1.6877	0.4597	1.0282	0.7198	0.1699	0.7332	0.0

55

RECRUITING COMMAND OPTIMIZATION
FOR ALL AREAS

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TOTAL FOR	494	548	578	548	578	548	548	578	548
ADVERTISING	6.4327	0.8937	1.2218	1.2139					
RECRUITING	83.3419	6.9432	6.9432						
TOTAL COST MILLION \$	89.7746	7.8368	8.1670	8.1590					
CONTRACTS	56.5889	4.8516	5.3279	4.9565					
ENTRY DELAY	10.3455	0.2897	0.2069	0.0207	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	44.4531	6.0058	6.5206	5.9362	3.2268	1.5254	0.9148	0.8197	0.4539
TOTAL ACCESSIONS	34.7386	6.2955	6.7275	5.9569	3.2268	1.5254	0.9148	0.8197	0.4539
QUOTAS	63.0630	7.0230	6.9350	6.9490	3.0390	1.0030	0.8120	0.4320	0.7220
SHORTFALLS	8.5407	0.7275	0.2075	0.9921	0.0	0.0882	0.0	0.0	0.3051

RECRUITING/NOVA RECRUITING COMMAND OPTIMIZATION

TOTAL FOR MONTH APR 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 6.6327

RECRUITING 83.3419

TOTAL COST MILLION 89.9746

CONTRACTS 56.5889

ENTRY DELAY 10.3658

ACCESSIONS 44.4531

TOTAL ACCESSIONS 56.7986

QUOTAS 83.0630

SHORTFALLS 9.3407

ENTRY DELAY 10.3658 0.0 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 44.4531 0.2823 0.2823 1.9306 0.2774 0.1897 0.0213

TOTAL ACCESSIONS 56.7986 0.2823 0.2823 1.9306 0.2774 0.1897 0.0213

QUOTAS 83.0630 0.2810 0.2810 1.8430 0.2810 0.2010 0.0200

SHORTFALLS 9.3407 0.0081 0.0081 0.0154 0.0036 0.0113 0.0

RECRUITING/NAVY RECRUITING EXPENDITURE OPTIMIZATION

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
CONTRACTS FOR REGION 1	14,5017	0.0600	1.0065	1.0638	1.5215	1.5471	1.0496	0.9812	1.2592
CONTRACTS FOR REGION 2	14,2639	0.0317	0.9890	1.0408	1.5253	1.5394	1.0691	0.9979	1.2774
CONTRACTS FOR REGION 3	10,3643	0.5932	0.7029	0.7305	1.1027	1.0335	0.7626	0.7031	0.9606
CONTRACTS FOR REGION 4	3,2222	0.1999	0.2296	0.2392	0.3367	0.3196	0.2339	0.2162	0.2797
CONTRACTS FOR REGION 5	8,0249	0.4368	0.5509	0.5623	0.8185	0.7727	0.5762	0.5426	0.6961
CONTRACTS FOR REGION 6	5,2118	0.3687	0.4270	0.4440	0.6190	0.5818	0.4287	0.3969	0.5027
TOTAL (1000'S)	56,5889	3.2903	3.8959	4.0806	5.9236	5.5942	4.1110	3.8380	4.9157
ACCESSIONS FOR REGION 1	13,2271	0.9635	0.7698	0.7133	0.8422	0.9153	0.7058	0.8642	1.7439
ACCESSIONS FOR REGION 2	13,5352	1.0223	0.7902	0.7330	0.8586	0.9326	0.7154	0.8793	1.7952
ACCESSIONS FOR REGION 3	10,4871	0.8811	0.8126	0.8036	0.6503	0.7296	0.5391	0.5508	1.4133
ACCESSIONS FOR REGION 4	3,7439	0.4575	0.2776	0.2414	0.2211	0.2599	0.1798	0.2153	0.5174
ACCESSIONS FOR REGION 5	7,3450	0.5305	0.4218	0.3907	0.4578	0.4970	0.3846	0.4743	0.9632
ACCESSIONS FOR REGION 6	6,4304	0.7068	0.4545	0.4013	0.3884	0.4446	0.3167	0.3820	0.8734
TOTAL (1000'S)	54,7986	4.6675	3.3873	3.0833	3.4182	3.7791	2.8404	3.4658	7.3063
QUOTAS	54,6420	5.7710	4.8750	3.5630	4.1330	3.9490	3.8170	4.1990	7.0300
SHORTFALLS	0.0	1.1035	1.4877	0.4597	0.7148	0.1699	0.9766	0.7332	0.0

RECRUITING/NOVA RECRUITING COMMAND OPTIMIZATION

TOTAL FOR NOV 446 446 588

CONTRACTS FOR REGION 1 15.5017 1.2427 1.3808 1.2741

CONTRACTS FOR REGION 2 15.2439 1.2421 1.3862 1.2778

CONTRACTS FOR REGION 3 10.3643 0.8893 0.9962 0.9144

CONTRACTS FOR REGION 4 3.2222 0.2211 0.3011 0.2781

CONTRACTS FOR REGION 5 0.0219 0.0012 0.0099 0.1039

CONTRACTS FOR REGION 6 5.3118 0.4350 0.5323 0.5082

TOTAL 56.5889 4.0016 5.2279 4.9565

ACCESSIONS FOR REGION 1 13.2271 1.2950 1.6920 1.5256

ACCESSIONS FOR REGION 2 13.5392 1.6140 1.7055 1.5333

ACCESSIONS FOR REGION 3 10.4871 1.1678 1.2342 1.0923

ACCESSIONS FOR REGION 4 3.7439 0.3756 0.3898 0.3370

ACCESSIONS FOR REGION 5 7.3450 0.8603 0.9286 0.8208

ACCESSIONS FOR REGION 6 6.4306 0.6748 0.7064 0.6158

TOTAL 56.7986 6.2955 6.7275 6.9569

QUANTAS 56.6420 7.0230 8.9350 8.8490

SHORTFALLS 0.0 0.7275 0.2075 0.8921

58

RECRUITING AND TRAINING EXPENDITURE OPTIMIZATION

		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
	TOTAL FOR POST-RECRUITING									
ACCESSIONS FOR REGION 1	2.5619	0.0239	0.3899	0.2338	0.2092	0.1160	0.1067	0.0724	0.0710	0.4157
ACCESSIONS FOR REGION 2	2.5829	0.0314	0.3024	0.2330	0.2112	0.1170	0.1079	0.0734	0.0714	0.4199
ACCESSIONS FOR REGION 3	1.8410	0.5923	0.2806	0.1679	0.1504	0.0834	0.0764	0.0519	0.0511	0.2584
ACCESSIONS FOR REGION 4	0.5829	0.1813	0.0858	0.0514	0.0460	0.0255	0.0234	0.0159	0.0155	0.0910
ACCESSIONS FOR REGION 5	1.4628	0.4654	0.2196	0.1326	0.1191	0.0655	0.0598	0.0399	0.0446	0.2407
ACCESSIONS FOR REGION 6	1.0259	0.3326	0.1971	0.0940	0.0840	0.0466	0.0426	0.0289	0.0285	0.1659
TOTAL (1000'S)	10.0411	3.2268	1.3254	0.9148	0.8197	0.4539	0.4169	0.2823	0.2823	1.6306
QUOTAS	10.0410	3.0290	1.3040	1.0030	0.8120	0.4320	0.4220	0.2910	0.3010	1.6450
SHORTFALLS	0.0	0.0	0.0	0.0882	0.0	0.0	0.3051	0.0087	0.0187	0.0144

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

	JUL	AUG	SEP
TOTAL FOR			
POSITIVE			
ACCESSIONS FOR REGION 1	2.5619	0.0703	0.0059
ACCESSIONS FOR REGION 2	2.5829	0.0709	0.0059
ACCESSIONS FOR REGION 3	1.8410	0.0505	0.0039
ACCESSIONS FOR REGION 4	0.2629	0.0153	0.0012
ACCESSIONS FOR REGION 5	1.5628	0.0522	0.0030
ACCESSIONS FOR REGION 6	1.0229	0.0881	0.0022

TOTAL	10.0411	0.2776	0.0213
QUOTAS	10.0410	0.2810	0.0200
SHORTFALLS	0.0	0.0036	0.0113

NAVY RECRUITING COMMAND ADVERTISING EXPENDITURE OPTIMIZATION (HS62, FY79) DETAILED REPORT FOR AREA

	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR HORIZON									
ADVERTISING	1.8512	0.0057	0.0219	0.1032	0.1029	0.1077	0.1064	0.1129	0.1982
RECRUITING	21.2642	1.7720	1.7720	1.7720	1.7720	1.7720	1.7720	1.7720	1.7720
TOTAL COST (MILLION \$)	22.9054	1.7767	1.7939	1.8032	1.8749	1.8797	1.8784	1.8850	1.9682
CONTRACTS	16.5017	0.8600	1.0063	1.0438	1.5215	1.4471	1.0496	0.9812	1.2592
INITIAL DELAY ENTRY POOL	1.8546	0.5601	0.2611	0.1855	0.0797	0.1335	0.0538	0.0556	0.3023
ACCESSIONS	11.5025	0.4033	0.5287	0.5278	0.7765	0.7818	0.6520	0.8086	1.4416
TOTAL ACCESSIONS	13.2271	0.9634	0.7298	0.7133	0.8522	0.9153	0.7038	0.8642	1.7439
QUOTAS	13.0680	1.1940	1.0100	0.7510	0.8590	0.8220	0.7950	0.8730	1.4460
SHORTFALLS	0.1087	0.2306	0.7092	0.0277	0.0956	0.0	0.0892	0.0088	0.0

RECRUITING/NOVY SECURITY COMMAND DETAILED REPORT FOR AREA OPTIMIZATION

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TOTAL FOR HORIZON	79	79	79	79	79	80	80	80	80
ADVERTISING	1.6512	0.2256	0.3062	0.3119					
RECRUITING	21.2642	1.7720	1.7720	1.7720					
TOTAL COST (MILLION \$)	22.9054	2.0016	2.0782	2.0839					
CONTRACTS	14.2017	1.2627	1.3808	1.2761					
INITIAL DELAY	1.0546	0.0919	0.0371	0.0037	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	17.4025	1.5430	1.6559	1.5208	0.8239	0.2338	0.2092	0.1160	0.1067
TOTAL ACCESSIONS	13.2311	1.5920	1.6930	1.5246	0.8239	0.2338	0.2092	0.1160	0.1067
QUOTAS	13.0680	1.4260	1.4390	1.4210	0.5430	0.1900	0.150	0.0770	0.1300
SHORTFALLS	0.7087	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0233

RECRUITING AND NAVY RECRUITING COMMAND DETAILED REPORT FOR 1981 OPTIMIZATION

TOTAL FOR HORIZON 488 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 1.6412

RECRUITING 21.2642

TOTAL COST (MILLION \$) 22.9054

CONTRACTS 14.5017

INITIAL DELAY 1.8346 0.0 0.0 0.0 0.0 0.0 0.0 0.0055
ACCESSIONS 11.9025 0.0724 0.0710 0.4157 0.0703 0.0476 0.0055

TOTAL ACCESSIONS 13.2511 0.0724 0.0710 0.4157 0.0703 0.0476 0.0055
QUOTAS 13.0680 0.0520 0.0530 0.2950 0.0500 0.0360 0.0050
SHORTFALLS 0.7087 0.0 0.0 0.0 0.0 0.0 0.0

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA

TOTAL FOR HORIZON	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
ADVERTISING	1.6547	0.0046	0.0223	0.0313	0.1120	0.1032	0.1075	0.1076	0.1148
RECRUITING	21.3383	1.7865	1.7865	1.7865	1.7865	1.7865	1.7865	1.7865	1.7865
TOTAL COST (MILLION \$)	23.0930	1.7911	1.8089	1.8179	1.8985	1.8897	1.8940	1.8941	1.9013
CONTRACTS	14.5638	0.8317	0.9880	1.0408	1.4753	1.5253	1.4395	1.0601	0.9979
INITIAL DELAY ENTRY POOL	2.0934	0.6322	0.2721	0.2093	0.1696	0.0900	0.1507	0.0607	0.0628
ACCESSIONS	11.4418	0.3901	0.5181	0.5237	0.7865	0.7684	0.7819	0.8567	0.8165
TOTAL ACCESSIONS	13.2322	1.0223	0.7902	0.7330	0.9580	0.8584	0.9328	0.7154	0.8793
QUINTAS	9.8450	0.9280	0.7850	0.5690	0.7960	0.6660	0.6360	0.6150	0.6640
SHORTFALLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RECRUITING/NAVY RECRUITING COMMAND OPTIMIZATION
DETAILED REPORT FOR AREA 2

[illegible]

RECRUITING/ADVANTAGE EXPENDITURE OPTIMIZATION RECRUITING/ADVANTAGE EXPENDITURE OPTIMIZATION

TOTAL FOR HORIZON APR 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 1.657

RECRUITING 21.4383

TOTAL COST (MILLION \$) 23.0930

CONTRACTS 14.5639

INITIAL DELAY 2.0934

ENTRY POINT 11.7418

ACCESSIONS 13.5322

TOTALS 9.8450

QUANTAS 0.0

SIMULTANEOUS 0.0

INITIAL DELAY	2.0934	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ENTRY POINT	11.7418	0.0734	0.0716	0.4190	0.0709	0.0478	0.0055		
ACCESSIONS	13.5322	0.0734	0.0716	0.4190	0.0709	0.0478	0.0055		
TOTALS	9.8450	0.0590	0.0619	0.3330	0.0370	0.0410	0.0040		
QUANTAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SIMULTANEOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

NAVY RECRUITING COMMAND
RECRUITING BUDGET PERFORMANCE INITIALIZATION

	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR HORIZON	1.1795	0.0033	0.0157	0.0223	0.0790	0.0745	0.0770	0.0809	0.1407
ADVERTISING	1.1795	1.2734	1.2734	1.2734	1.2734	1.2734	1.2734	1.2734	1.2734
RECRUITING	15.2809	1.2734	1.2734	1.2734	1.2734	1.2734	1.2734	1.2734	1.2734
TOTAL COST (BILLION \$)	16.4604	1.2767	1.2891	1.2958	1.3249	1.3469	1.3504	1.3563	1.4141
CONTRACTS	10.3643	0.8932	0.7029	0.7305	1.0354	1.0271	1.0394	0.7626	0.9006
ENTRY POINT	2.3676	0.7089	0.3052	0.2367	0.1901	0.1009	0.1690	0.0681	0.3826
ACCESSIONS	0.1347	0.1782	0.1685	0.1686	0.3332	0.3449	0.5606	0.4700	0.5803
TOTAL ACCESSIONS	10.4871	0.9871	0.8726	0.8036	0.7433	0.6503	0.7296	0.5381	0.6508
QUOTAS	12.5480	1.1570	0.9720	0.7040	0.9350	0.8250	0.7810	0.7630	1.3960
SHORTFALLS	2.0782	0.1599	0.2985	0.0994	0.2111	0.1151	0.0516	0.2249	0.1882

67

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 3

TOTAL FOR	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
HORIZON	44	54	54	54	95	95	16	20	80	80
ADVERTISING	1.1795	0.1645	0.2208	0.2239						
RECRUITING	15.2809	1.2735	1.2735	1.2735						
TOTAL COST (MILLION \$)	16.4604	1.4379	1.4942	1.4973						
CONTRACTS	10.3453	0.8892	0.9962	0.9155						
INITIAL DELAY	2.3475	0.0657	0.0448	0.0047	0.0	0.0	0.0	0.0	0.0	0.0
ENTRY POOL										
ACCESSIONS	8.1397	1.1021	1.1872	1.0908	0.5923	0.2806	0.1679	0.1504	0.0834	0.0764
TOTAL ACCESSIONS	10.4811	1.1678	1.2332	1.0935	0.8923	0.2806	0.1679	0.1504	0.0834	0.0764
QUITS	12.5480	1.3940	1.3800	1.3630	0.6870	0.2940	0.2280	0.1840	0.0950	0.1640
SHORTFALLS	2.0782	0.2262	0.1458	0.2675	0.0947	0.0134	0.0601	0.0336	0.0156	0.0876

RECRUITING COSTS BY MONTH AND OPTIMIZATION

TOTAL FOR MONTHS APR MAY JUN JUL AUG SEP

ADVERTISING 1.1795

RECRUITING 15.2809

TOTAL COST (MILLION \$)

CONTRACTS 10.3643

INITIAL DELAY 2.3374

ACCESSIONS 8.1357

TOTAL ACCESSIONS 10.4871

QUOTAS 12.5400

SHORTFALLS 2.0702

RECRUITING ADVANCED REPORT FOR AREA OPTIMIZATION

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
TOTAL FOR HORIZON	78	78	78	78	78	78	78	78	78
ADVERTISING	0.3606	0.0011	0.0070	0.0242	0.0226	0.0238	0.0237	0.0248	0.0433
RECRUITING	4.6725	0.3895	0.3895	0.3895	0.3895	0.3895	0.3895	0.3895	0.3895
TOTAL COST (MILLION \$)	5.0331	0.3905	0.3965	0.4136	0.4122	0.4132	0.4131	0.4142	0.4327
CONTRACTS	3.2222	0.1999	0.2296	0.3188	0.3367	0.3196	0.2339	0.2162	0.2797
INITIAL DELAY ENTRY POINT	1.2043	0.3637	0.1566	0.0975	0.0518	0.0867	0.0349	0.0361	0.1963
ACCESSIONS	2.5396	0.0938	0.1210	0.1739	0.1695	0.1732	0.1699	0.1792	0.3211
TOTAL ACCESSIONS	3.1439	0.5813	0.3176	0.2313	0.2211	0.2299	0.1798	0.2153	0.5174
QUOTAS	9.5210	0.9300	0.5060	0.7090	0.5940	0.5720	0.5480	0.6200	1.1260
SHORTFALLS	5.7771	0.3725	0.5225	0.5375	0.3729	0.3121	0.3682	0.4047	0.6086

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 1

	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TOTAL FOR MONTH										
ADVERTISING	0.2000	0.0201	0.0000	0.0001						
RECRUITING	0.0725	0.3095	0.3095	0.3095						
TOTAL COST (MILLION \$)	0.2725	0.3296	0.3095	0.3096						
CONTRACTS	0.2222	0.2713	0.3011	0.2781						
INITIAL DELAY	1.2033	0.0337	0.0231	0.0029	0.0	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	0.3396	0.3419	0.3637	0.3365	0.1813	0.0838	0.0913	0.0480	0.0255	0.0236
TERMINATIONS	0.1032	0.2124	0.3030	0.2370	0.1033	0.0020	0.0014	0.0000	0.0222	0.0234
QUOTAS	0.3210	1.1100	1.0900	1.1000	0.3530	0.1520	0.1170	0.0950	0.0500	0.0840
SHORTFALLS	0.7771	0.7426	0.7002	0.7710	0.7717	0.0652	0.0856	0.0490	0.0245	0.0604

RECRUITING/NOVATY/NAVY COMMAND OPTIMIZATION
DETAILED AREA 1 FOR AREA 1

TOTAL FOR APR 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 0.3606

RECRUITING 4.6725

TOTAL COST (MILLION \$) 5.0331

CONTRACTS 3.2222

INITIAL DELAY 1.2043 0.0 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 2.5396 0.0159 0.0155 0.0910 0.0133 0.0104 0.0012

TOTAL ACCESSIONS 3.1538 0.0189 0.0124 0.0910 0.0133 0.0104 0.0012

QUITAS 9.5210 0.0340 0.0350 0.1910 0.0330 0.0230 0.0020

SHORTFALLS 5.7771 0.0181 0.0195 0.1000 0.0177 0.0126 0.0008

RECRUITING ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA

TOTAL FOR MONTH	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
ADVERTISING	0.9372	0.0029	0.0119	0.0168	0.0596	0.0553	0.0378	0.0385	0.0623
RECRUITING	12.1415	1.0118	1.0018	1.0118	1.0118	1.0118	1.0118	1.0118	1.0118
TOTAL COST : MILLION \$1	13.0787	1.0147	1.0136	1.0286	1.0715	1.0671	1.0496	1.0503	1.0741
CONTRACTS	8.0268	0.4368	0.5609	0.5623	0.7839	0.8184	0.7127	0.5762	0.5426
INITIAL DELAY	1.0702	0.3286	0.1602	1.078	0.0873	0.0664	0.0376	0.0313	0.0323
ACCESSIONS	8.2888	0.7059	0.7281	0.7289	0.5204	0.5114	0.4193	0.3523	0.4420
TOTALS	1.3480	0.4305	0.4215	0.3907	0.5017	0.4378	0.4970	0.3846	0.4763
QUOTAS	1.5280	0.6910	0.5820	0.5170	0.5890	0.4910	0.4660	0.4520	0.4990
SIMILIFALLS	0.5539	0.1605	0.1605	0.0263	0.0813	0.0332	0.0	0.0674	0.0247

NAVY RECRUITING COMMAND

[illegible]

RECRUITING DETAIL REPORT FOR LINE OPTIMIZATION

TOTAL FOR APR MAY JUN JUL AUG SEP

ADVERTISING 0.9372

RECRUITING 12.1475

TOTAL COST (MILLION \$) 13.0847

CONTRACTS 8.0249

ENTRY DELAY 1.0782 0.0 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 9.2688 0.399 0.446 0.497 0.522 0.506 0.0030

TOTAL ACCESSIONS 7.3490 0.0399 0.0446 0.0497 0.0522 0.0506 0.0030

QUOTAS 7.5280 0.0300 0.0310 0.0320 0.0330 0.0340 0.0020

SHORTFALLS 0.5539 0.0 0.0 0.0 0.0 0.0 0.0

NAVY RECRUITING COMMAND RECRUITING ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 6

TOTAL FOR MONTH	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
ADVERTISING	0.6595	0.0020	0.0090	0.0129	0.0447	0.0418	0.0434	0.0432	0.0455
RECRUITING	8.5445	0.7120	0.7120	0.7120	0.7120	0.7120	0.7120	0.7120	0.7120
TOTAL COST (MILLION \$)	9.2040	0.7140	0.7210	0.7249	0.7567	0.7539	0.7554	0.7552	0.7575
CONTRACTS	2.9118	0.3687	0.4270	0.4440	0.5870	0.6190	0.5918	0.4287	0.3969
INITIAL DELAY ENTRY POINT	1.7677	0.5338	0.2228	0.1768	0.1432	0.0760	0.1273	0.0513	0.0530
ACCESSIONS	4.6627	0.1729	0.2247	0.2246	0.3226	0.3124	0.3174	0.2655	0.3289
TOTAL ACCESSIONS	6.4304	0.7068	0.4945	0.4013	0.4698	0.3884	0.4448	0.3167	0.3820
QUOTAS	10.5530	0.9810	0.8260	0.6070	0.8380	0.6980	0.6720	0.6440	0.7040
SHORTFALLS	4.1226	0.2742	0.3715	0.2057	0.3724	0.3096	0.2274	0.3273	0.3220

RECRUITING/NAVY RECRUITING COMMAND OPTIMIZATION
DETAILED REPORT FOR AREA

	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 79	JAN 80	FEB 80	MAR 80
TOTAL FOR MONTH	0.6395	0.6913	0.1226	0.1245					
ADVERTISING	0.5445	0.7120	0.7120	0.7120					
RECRUITING	9.2040	0.8036	0.8346	0.8365					
TOTAL COST (MILLION \$)	5.9118	0.4950	0.5529	0.5082					
CONTRACTS	1.1617	0.0493	0.0254	0.0023	0.0	0.0	0.0	0.0	0.0
INITIAL DELAY	4.6627	0.6253	0.6710	0.6123	0.1571	0.0540	0.0840	0.0466	0.0426
ACCESSIONS	8.4304	0.6718	0.7064	0.6128	0.1971	0.0340	0.0840	0.0466	0.0426
TOTAL ACCESSIONS	10.5530	1.1640	1.1400	1.1160	0.2230	0.1710	0.1390	0.0740	0.1230
QUANTAS	5.1226	0.6892	0.4336	0.3002	0.1064	0.0559	0.0550	0.0274	0.0804
SHORTFALLS									

NAVY RECRUITING COMMAND RECRUITING DEFICIENT REPORT FOR AREA OPTIMIZATION

TOTAL FOR HORIZON APR 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 0.6595

RECRUITING 8.5545

TOTAL COST (MILLION \$) 9.2040

CONTRACTS 5.9118

INITIAL DELAY ENTRY POOL 1.7677 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 4.6627 0.0289 0.0284 0.1659 0.0281 0.0190 0.0022

TOTAL ACCESSIONS 6.3304 0.0289 0.0284 0.1659 0.0281 0.0190 0.0022

QUOTAS 10.5530 0.0500 0.0510 0.2810 0.0480 0.0340 0.0030

SHORTFALLS 4.7226 0.0211 0.0226 0.1131 0.0199 0.0150 0.0008

terminal unattrited delayed entry pool of 10,041 (the required amount). Note this terminal DEP is distributed as the following over the 6 Areas: 2,562 in Area 1; 2,583 in Area 2; 1,841 in Area 3; 563 in Area 4; 1,463 in Area 5; 1,029 in Area 6. Also one can see how the DEP position at the end of the year FY79 will convert to accessions over the next year, i.e., 3,029 in October 1979, 1,304 in November 1979, etc....., 21 in September 1980.

Consider the inputs for the next year, i.e., for FY80. Note the problem parameters and problem size are the same. The only changes for FY80 were as follows:

- 1) The total quota desired for FY80 was 55,500 (i.e., a slight increase over the 54,642 for the year before. Recall also that the initial DEP is lower now at 10,041 compared to 10,833 for the year before.)

- 2) The terminal DEP position is 10,850 (up from 10,041 the year before).

- 3) The size of the male High School senior population dropped slightly, e.g., for Area 1, January 1980, the number is 332,634 compared to 334,331 the year before.

- 4) The employment rate went down from say 6.55% for Area 1, January 1979 to 6.4766% for Area 1, January 1980.

- 5) The cost of living index was left at the same value as for FY79 so that the dollars reported are in FY79 dollars. Everything else was unchanged. Note that the user does not have to touch the new Results File as it is automatically created by the Program. It automatically inputs the recruiters in the field as of September, 1979 (i.e., the beginning of FY80) the levels of advertising, and the distribution of the DEP pool. Consider the outputs of FY80. The total cost is \$100.1578 Million in FY79 dollars.

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION (HSG-1, EX 80) LISTING OF INPUT DATA

PROBLEM PARAMETERS:

80 FY FISCAL YEAR
 1 MODE TYPE OF DELAY FACTORS IN USE
 79.50 RUBI TOTAL RECRUITING BUDGET
 6.00 RUBI TOTAL ADVERTISING BUDGET
 8.0 PCTLO LIMIT ON RECRUITER GROWTH PER PERIOD (3)
 0 1 TYPE TYPE OF BUDGET CONSTRAINTS

PROBLEM SIZE VALUES:

1 MAX NUMBER OF REGIONS
 12 JMAX NUMBER OF TIME PERIODS
 13 JMAX NUMBER OF PERIODS ENTRY MAY BE DELAYED AFTER ENLISTMENT
 3 JMAX NUMBER OF TIME PERIODS (INCLUDING POST-HORIZON)
 2 JMAX NUMBER OF LAGGED PERIODS FOR PRODUCTION FUNCTIONS
 2 JMAX TYPES OF ADVERTISING

RECRUITING/ADVERTISING OF INDIVIDUALS
NAVY RECRUITING COMMAND
LISTING OF INDIVIDUALS
BASE FILE

[illegible]

[illegible]

(H563 FY80)

۷۰۰

WILSON, JAMES H. 1924-1925

۷۲

RECRUITING/AV
NAVY RECRUITING COMMAND
NOT RECRUITING/AV
OPTIMIZATION
LISTING OF INPUT DATA
SCENARIO FILE[illegible]

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

[illegible]

NAVY RECRUITING COMMAND
RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

[illegible]

READING OF INPUT DATA COMPLETE.

MATRIX GENERATION COMPLETE
1006 CARDS WRITTEN TO SCRATCH FILE NUMBER 12

RECRUITING COMMAND (HS6, FY80)

TOTAL FOR MONTH		DEC 79	JAN 80	FEB 80	MAR 80	APR 80	MAY 80	JUN 80
ADVERTISING	7.1768	0.0199	0.4752	0.4436	0.4635	0.4659	0.4908	0.8631
RECRUITING	92.9810	7.7485	7.7485	7.7485	7.7485	7.7485	7.7485	7.7485
TOTAL	100.1578	7.7684	8.2237	8.1920	8.2119	8.2143	8.2392	8.6115
ADVERTISING	60.8978	3.5276	6.3328	6.0400	6.0188	6.0521	6.1274	5.3420
RECRUITING	5.5896	3.0817	0.8735	0.7830	0.3582	0.2697	0.2695	1.5573
TOTAL	66.4874	6.6093	7.2063	6.8230	6.3770	6.3218	6.3969	6.9023
ADVERTISING	37.2824	5.1381	3.6279	3.0933	3.6158	3.0550	3.6641	7.6197
RECRUITING	5.7710	5.8750	3.5430	4.9390	3.9490	3.8170	4.1990	7.0300
TOTAL	43.0534	11.0130	7.6409	8.5720	7.5640	7.8720	7.8631	14.6497

AD-A114 009

DUKE UNIV DURHAM NC CENTER FOR APPLIED BUSINESS RESEARCH F/G 5/9
A MULTI-YEAR BUDGET GENERATION PROGRAM FOR USE IN NAVY RECRUITI--ETC(U)
OCT 81 R C MOREY, J M MCCANN, D P ROBINSON N00014-80-C-0200
UNCLASSIFIED ONR-200-2 NL

2 1/2 2

2 1/2 2

2 1/2 2

2 1/2 2

END

DATE

5 82

DTIC

RECRUITING AND PERSONNEL ORGANIZATION

MAR 61

FEB 61

JAN 61

DEC 60

NOV 60

OCT 60

SEP 60

AUG 60

JUL 60

JUN 60

MAY 60

ADVERTISING

1074.768

2.1768

1.0009

1.3611

1.3691

RECRUITING

92.9810

7.7484

7.7484

7.7484

TOTAL COST
(MILLION \$)

100.1578

8.7488

9.1095

9.1125

CONTRACTS

60.8278

8.2244

8.1960

8.3979

INITIAL DELAY

9.5896

0.2648

0.1812

0.0201

0.0

0.0

0.0

0.0

0.0

0.0

ACCESSIONS

47.7936

6.5899

7.0167

6.7217

3.6221

1.6553

0.9881

0.8867

0.4901

0.4927

ASSIGNMENTS

57.3892

6.2247

2.1979

6.5420

3.4821

1.4523

0.3881

0.8867

0.4901

0.4927

QUOTAS

63.0430

7.0230

6.9350

6.9490

3.0290

1.3040

1.0030

0.8120

0.4320

0.7220

SHORTFALLS

6.5383

0.2883

0.0

0.4070

0.0

0.0

0.0149

0.0

0.0

0.2693

ACCOUNTING BOARD

1960-1961

ADVERTISING 7.1740

RECRUITING 92.9810

TOTAL COST (MILLION \$) 100.1550

CONTRACTS 60.8970

INITIAL DELAY 9.8896

ACCESSIONS 17.1956

TOTAL \$100.1550

QUOTAS 8.9040

SHORTFALLS 5.3303

RECRUITING/NAVY RECRUITING EXPENSE OPTIMIZATION

TOTAL FOR		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
FOR REGION										
CONTRACTS	1	15.4408	0.9246	1.0023	1.0993	1.2109	1.3337	1.4111	1.0373	1.3505
FOR REGION	1									
CONTRACTS	2	15.0861	0.9381	1.0008	1.1118	1.2107	1.3382	1.4331	1.0892	1.4911
FOR REGION	2									
CONTRACTS	3	13.1229	0.8629	0.9023	0.9469	1.0119	1.1193	0.9116	0.8232	1.0590
FOR REGION	3									
CONTRACTS	4	3.2707	0.1964	0.2327	0.2497	0.3129	0.3263	0.2420	0.2116	0.2891
FOR REGION	4									
CONTRACTS	5	0.0533	0.4366	0.5402	0.5699	0.7190	0.7608	0.5010	0.5444	0.7129
FOR REGION	5									
CONTRACTS	6	0.1812	0.3060	0.3100	0.3082	0.4219	0.4527	0.4102	0.4138	0.5293
FOR REGION	6									

TOTAL (1000'S) 30.8978 3.2776 3.1330 4.3379 4.0000 6.3396 6.0186 4.5521 4.1274 5.3420

ACCESIONS	1	14.5788	1.2209	0.9223	0.7785	1.0210	0.9177	0.9351	0.7623	0.9248	1.9324
FOR REGION	1										
ACCESIONS	2	14.9158	1.2321	0.9399	0.7865	1.0576	0.9450	0.9531	0.7828	0.9576	1.9862
FOR REGION	2										
ACCESIONS	3	11.8428	0.8798	0.8878	0.8858	1.0188	0.7200	0.7248	0.6029	0.7292	1.4912
FOR REGION	3										
ACCESIONS	4	3.1112	0.2653	0.2039	0.1724	0.2177	0.1922	0.1969	0.1630	0.1970	0.4146
FOR REGION	4										
ACCESIONS	5	7.6658	0.4492	0.4208	0.4123	0.5336	0.4676	0.4699	0.3898	0.4863	1.0236
FOR REGION	5										
ACCESIONS	6	5.8507	0.4893	0.3782	0.3226	0.5182	0.3733	0.3739	0.3066	0.3712	0.7717
FOR REGION	6										

TOTAL (1000'S) 57.3022 4.7361 3.4279 3.0583 4.0276 3.6158 3.4540 3.0072 3.6641 7.6197

SHORTFALLS 0.0 1.0349 1.2471 0.4847 0.9114 0.5172 0.2950 0.8098 0.5349 0.0

RECRUITING/NOVAT RECRUITING EXPENDITURE OPTIMIZATION

	18607500	116	416	588
CONTRACTS FOR REGION 1	155500	155500	155500	155500
CONTRACTS FOR REGION 2	180000	180000	180000	180000
CONTRACTS FOR REGION 3	121255	121255	121255	121255
CONTRACTS FOR REGION 4	32207	0.2761	0.3048	0.2909
CONTRACTS FOR REGION 5	0.0335	0.0039	0.0117	0.0115
CONTRACTS FOR REGION 6	0.1012	0.0318	0.0270	0.0318
TOTAL 11000151	003976	52265	55600	53973
ACCESSIONS FOR REGION 1	155500	155500	155500	155500
ACCESSIONS FOR REGION 2	180000	180000	180000	180000
ACCESSIONS FOR REGION 3	121255	121255	121255	121255
ACCESSIONS FOR REGION 4	32207	0.2761	0.3048	0.2909
ACCESSIONS FOR REGION 5	0.0335	0.0039	0.0117	0.0115
ACCESSIONS FOR REGION 6	0.1012	0.0318	0.0270	0.0318
QUOTAS	555000	555000	555000	555000
SHORTFALLS	0.0	0.2003	0.0	0.0070

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

	TOTAL FOR POSTAL	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
ACCESSIONS FOR REGION 1	2.730	0.870	0.515	0.230	0.233	0.113	0.126	0.113	0.075	0.076	0.495
ACCESSIONS FOR REGION 2	2.810	0.903	0.524	0.238	0.229	0.110	0.124	0.110	0.080	0.078	0.563
ACCESSIONS FOR REGION 3	2.170	0.697	0.330	0.178	0.179	0.091	0.094	0.090	0.061	0.060	0.353
ACCESSIONS FOR REGION 4	0.575	0.147	0.084	0.027	0.072	0.024	0.020	0.024	0.012	0.015	0.036
ACCESSIONS FOR REGION 5	1.593	0.461	0.213	0.129	0.119	0.069	0.067	0.080	0.040	0.049	0.243
ACCESSIONS FOR REGION 6	1.084	0.350	0.163	0.089	0.084	0.049	0.049	0.049	0.030	0.029	0.174
TOTAL (1000's)	10.950	3.421	1.943	0.981	0.867	0.437	0.490	0.437	0.304	0.304	1.767
QUOTAS	10.850	3.030	1.300	1.000	0.810	0.420	0.430	0.420	0.290	0.300	1.640
SHORTFALLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NAVY RECRUITING COMMAND RECRUITING ADVERTISING EXPENDITURE OPTIMIZATION (FY 80, FY 81)

TOTAL FOR HORIZON	OCT 80	NOV 80	DEC 80	JAN 81	FEB 81	MAR 81	APR 81	MAY 81	JUN 81
ADVERTISING	1.8104	0.0031	0.0240	0.0340	0.1202	0.1125	0.1191	0.1167	0.1238
RECRUITING	23.9333	1.9556	1.9556	1.9556	1.9556	1.9556	1.9556	1.9556	1.9556
TOTAL COST MILLION \$	25.7437	1.9587	1.9796	1.9896	2.0758	2.0681	2.0747	2.0723	2.0794
CONTRACTS	13.8408	0.0246	1.0623	1.0943	1.5209	1.6103	1.5937	1.1111	1.0373
ENTRY DELAY	2.4667	0.3868	0.3726	0.2233	0.1808	0.1108	0.1018	0.0691	0.0678
ACCESSIONS	12.1721	0.5335	0.5399	0.5332	0.8212	0.8069	0.7336	0.6931	0.5570
TOTAL ACCESSIONS	14.5788	1.2205	0.9323	0.7185	0.9102	0.9177	0.9359	0.7623	0.9248
QUOTAS	17.990	0.5430	0.2340	0.1800	0.1438	0.0770	0.1300	0.0920	0.0530
SHORTFALLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RECRUITING MAXIMUM CAPABILITY OPTIMIZATION RECRUITING MAXIMUM CAPABILITY OPTIMIZATION

	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TOTAL FOR MONTH	1.8104	0.2338	0.3305	0.3555						
ADVERTISING	23.5553	1.9546	1.9546	1.9546						
RECRUITING	25.2656	2.2084	2.2084	2.2084						
TOTAL COST (MILLION \$)	12.9408	1.3294	1.4707	1.3676						
CONTRACTS	2.9467	0.0671	0.0455	0.0033	0.0	0.0	0.0	0.0	0.0	0.0
INITIAL DELAY	12.1321	1.8558	1.7654	1.6251	0.8788	0.4157	0.2300	0.2233	0.1236	0.1143
ACCESSIONS	14.8188	1.7129	1.8108	1.6303	0.8788	0.4157	0.2300	0.2233	0.1236	0.1143
TOTAL ACCESSIONS	1.7990	0.0500	0.0360	0.0040	0.2530	0.2340	0.1800	0.1450	0.0770	0.1300
QUOTAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0157
SHORTFALLS										

RECRUITING NAVY RECRUITING COMMAND OPTIMIZATION

TOTAL FOR APR MAY JUN JUL AUG SEP

ADVERTISING

1.0104

RECRUITING

2375553

TOTAL COST
(MILLION \$)

237656

CONTRACTS

15.6508

INITIAL DELAY

2.5567

ACCESSIONS

12172

TOTAL ACTIONS

15.8708

QUOTAS

17990

SHORTFALLS

0.0

	0.0	0.0	0.0	0.0	0.0	0.0
	0.0775	0.0761	0.0555	0.0553	0.0510	0.0059
	0.0719	0.0761	0.0645	0.0700	0.0510	0.0059
	0.0720	0.0761	0.0645	0.0700	0.0510	0.0059
	0.0	0.0	0.0	0.0	0.0	0.0

911

RECRUITING ADVERTISING COST REPORT FOR THE YEAR 1960

		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
TOTAL FOR MONTH										
ADVERTISING	1.8591	0.0052	0.0250	0.0349	0.1295	0.1157	0.1210	0.1213	0.1294	0.2242
RECRUITING	25.0887	2.0072	2.0072	2.0072	2.0072	2.0072	2.0072	2.0072	2.0072	2.0072
TOTAL COST (MILLION \$)	25.9478	2.0124	2.0322	2.0421	2.1328	2.1230	2.1282	2.1285	2.1366	2.2314
CONTRACTS	14.8463	0.9341	1.0805	1.1119	1.6004	1.6597	1.5885	1.5551	1.0892	1.4011
INITIAL DELAY	2.4669	0.7940	0.3747	0.2245	0.2017	0.1117	0.1030	0.0701	0.0684	0.4001
ACCESSIONS	12.6356	0.9384	0.5802	0.5677	0.5003	0.3335	0.5500	0.7125	0.8893	1.5860
TOTAL ACCESSIONS	14.9188	1.2321	0.9349	0.7895	1.0224	0.9450	0.9231	0.7826	0.9576	1.9862
SHORTFALLS	2.0310	0.8120	0.2640	0.2030	0.3240	0.0870	0.1460	0.0590	0.0610	0.3330
SHORTFALLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RECRUITING/ADVERTISING/RESEARCH/DEVELOPMENT/OPERATIONS/LOGISTICS/INTELLIGENCE/COMMAN

TOTAL FOR HORIZON APR 81 MAY 81 JUN 81 JUL 81 AUG 81 SEP 81

ADVERTISING 3.8591

RECRUITING 24.0827

TOTAL COST (MILLION \$) 25.9419

CONTRACTS 15.8463

INITIAL DELAY 2.4669 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 12.4490 0.0001 0.0778 0.4563 0.0771 0.0518 0.0060

TOTAL REVISIONS 14.9128 0.0891 0.0778 0.4563 0.0771 0.0518 0.0060

QUOTAS 2.0310 0.0590 0.0610 0.3330 0.0570 0.0410 0.0040

SHORTFALLS 0.0 0.0 0.0 0.0 0.0 0.0 0.0

RECRUITING ADVERTISING REPORT FOR AREA OPTIMIZATION

	OCT 79	NOV 79	DEC 79	JAN 80	FEB 80	MAR 80	APR 80	MAY 80	JUN 80
TOTAL FOR MONTH	1.5374	0.0038	0.0249	0.0949	0.0902	0.0925	0.0946	0.0980	0.1708
ADVERTISING	18.6222	1.5518	1.5518	1.5518	1.5518	1.5518	1.5518	1.5518	1.5518
RECRUITING	20.0596	1.5518	1.5518	1.5518	1.5518	1.5518	1.5518	1.5518	1.5518
TOTAL COST (MILLION \$)	12.1255	0.6499	0.8024	0.8468	1.2049	1.2896	1.1993	0.9116	0.8232
CONTRACTS	1.7583	0.5696	0.2680	0.1603	0.0796	0.0730	0.0686	0.0488	0.2850
INITIAL RELAY	9.5046	0.3192	0.4198	0.4259	0.6409	0.6403	0.6518	0.6804	1.2063
ACCESSIONS	11.2828	0.8798	0.6878	0.9888	0.7848	0.7248	0.6029	0.7292	1.4512
TOTAL ACCESSIONS	2.2780	0.6870	0.2950	0.2280	0.1840	0.2090	0.0680	0.0680	0.3730
SHORTFALLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RECRUITING/NOVY RECRUITING COMMAND OPTIMIZATION DETAILED REPORT FOR AREA 3

	JUL 80	AUG 80	SEP 80	OCT 80	NOV 80	DEC 80	JAN 81	FEB 81	MAR 81
TOTAL FOR	1.0374	0.2012	0.2686	0.2772					
ADVERTISING	1.0374	0.2012	0.2686	0.2772					
RECRUITING	16.6222	1.3318	1.3318	1.3318					
TOTAL COST (MILLION \$)	20.0956	1.7530	1.8204	1.8290					
CONTRACTS	12.1252	1.0987	1.1722	1.0977					
INITIAL DELAY	1.7503	0.0482	0.0328	0.0037	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	9.5046	1.2899	1.3007	1.2913	0.0979	0.3307	0.1779	0.0984	0.0901
TOTAL REJECTIONS	11.2628	1.3381	1.4234	1.2932	0.0979	0.3307	0.1779	0.0984	0.0901
QUOTAS	2.2780	0.0640	0.0460	0.0050	0.2940	0.2280	0.1840	0.0990	0.1440
SHORTFALLS	0.0	0.0	0.0	0.0	0.0	0.0302	0.0061	0.0006	0.0739

RECRUITING ADVERTISING COMMAND OPTIMIZATION DETAILED REPORT FOR AREA

TOTAL FOR MONTH APR MAY JUN JUL AUG SEP

ADVERTISING 1.4374

RECRUITING 10.6222

TOTAL COST (BILLION \$) 20.0596

CONTRACTS 12.1255

INITIAL DELAY 1.1593

ACCESSIONS 9.5056

TOTAL ACCESSIONS 11.2628

QUOTAS 2.2780

SHORTFALLS 0.0

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

RECRUITING/ADVERTISING REPORT FOR THE OPTIMIZATION

	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
TOTAL FOR MONTH	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
ADVERTISING	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
RECRUITING	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
TOTAL FOR MONTH	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
CONTRACTS	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
INITIAL DELAY	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
ACCESSIONS	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
RECESSIONS	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
QUOTAS	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461
SINATFALS	0.0011	0.0030	0.0072	0.0258	0.0234	0.0251	0.0253	0.0261	0.0261	0.0461

RECRUITING/NAVY RECRUITING COMMAND OPTIMIZATION DETAILED REPORT FOR AREA

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TOTAL FOR MONTH	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ADVERTISING	0.3809	0.0930	0.0704	0.0734					
RECRUITING	0.9343	0.9172	0.9172	0.9172					
TOTAL COST (MILLION \$)	5.3154	0.1002	0.0816	0.0846					
CONTRACTS	3.2707	0.2761	0.2308	0.2295					
ENTRY DELAY	0.5376	0.0146	0.0029	0.0011	0.01	0.0	0.0	0.0	0.0
ACCESSIONS	2.5736	0.3463	0.3719	0.3539	0.1847	0.0975	0.0977	0.0260	0.0265
TERMINATIONS	0.2418	0.2011	0.2010	0.2010	0.0074	0.0074	0.0074	0.0260	0.0244
QUOTAS	0.1696	0.0330	0.0020	0.3330	0.1520	0.1170	0.0950	0.0500	0.0440
SHORTFALLS	0.0877	0.0	0.0	0.1683	0.0646	0.0643	0.0678	0.0240	0.0396

RECRUITING/NAVY/RECRUITING COMMAND OPTIMIZATION

TOTAL FOR MONTH OF APR MAY JUN JUL AUG SEP

ADVERTISING 8.3809

RECRUITING 6.9345

TOTAL COST \$15.3154

CONTRACTS 3.2707

INITIAL DELAY 0.9376

ACCESSIONS 2.5736

TOTAL RECEPTIONS 2.1112

QUOTAS 1.1690

SHORTFALLS 0.0077

0.0 0.0 0.0 0.0 0.0 0.0

0.0162 0.0159 0.0157 0.0157 0.0168 0.0172

0.0162 0.0162 0.0162 0.0162 0.0162 0.0162

0.0340 0.0350 0.0350 0.0350 0.0350 0.0350

0.0178 0.0191 0.0172 0.0173 0.0174 0.0174

0.0020 0.0020 0.0020 0.0020 0.0020 0.0020

NAVY RECRUITING COMMAND RECRUITING OFFICE - PENSACOLA, FLORIDA

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
TOTAL FOR MONTH	0.0025	0.0123	0.0172	0.0610	0.0562	0.0590	0.0612	0.0646	0.1197
ADVERTISING	0.0025	0.0123	0.0172	0.0610	0.0562	0.0590	0.0612	0.0646	0.1197
RECRUITING	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TOTAL COST (MILLION \$)	0.0025	0.0123	0.0172	0.0610	0.0562	0.0590	0.0612	0.0646	0.1197
CONTRACTS	0.0331	0.0366	0.0502	0.0699	0.0790	0.0708	0.0580	0.0444	0.0729
INITIAL DELAY	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ACCESSIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TOTAL RECRUITS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
UNITAS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SHORTFALLS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

RECRUITING/ADAPTATION COMMAND

TOTAL FOR
JUN - AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL

ADVERTISING: 0.9719 0.1326 0.2056 0.1001

RECRUITING 12.5913 6650.1 6650.1 6650.1 6650.1

ITEM	QTY	UNIT	PRICE	TOTAL COST
1	1	EA	1.22	1.22
2	1	EA	1.25	1.25
3	1	EA	1.18	1.18
4	1	EA	1.18	1.18
5	1	EA	1.18	1.18
6	1	EA	1.18	1.18
7	1	EA	1.18	1.18
8	1	EA	1.18	1.18
9	1	EA	1.18	1.18
10	1	EA	1.18	1.18
11	1	EA	1.18	1.18
12	1	EA	1.18	1.18
13	1	EA	1.18	1.18
14	1	EA	1.18	1.18
15	1	EA	1.18	1.18
16	1	EA	1.18	1.18
17	1	EA	1.18	1.18
18	1	EA	1.18	1.18
19	1	EA	1.18	1.18
20	1	EA	1.18	1.18
21	1	EA	1.18	1.18
22	1	EA	1.18	1.18
23	1	EA	1.18	1.18
24	1	EA	1.18	1.18
25	1	EA	1.18	1.18
26	1	EA	1.18	1.18
27	1	EA	1.18	1.18
28	1	EA	1.18	1.18
29	1	EA	1.18	1.18
30	1	EA	1.18	1.18
31	1	EA	1.18	1.18
32	1	EA	1.18	1.18
33	1	EA	1.18	1.18
34	1	EA	1.18	1.18
35	1	EA	1.18	1.18
36	1	EA	1.18	1.18
37	1	EA	1.18	1.18
38	1	EA	1.18	1.18
39	1	EA	1.18	1.18
40	1	EA	1.18	1.18
41	1	EA	1.18	1.18
42	1	EA	1.18	1.18
43	1	EA	1.18	1.18
44	1	EA	1.18	1.18
45	1	EA	1.18	1.18
46	1	EA	1.18	1.18
47	1	EA	1.18	1.18
48	1	EA	1.18	1.18
49	1	EA	1.18	1.18
50	1	EA	1.18	1.18
51	1	EA	1.18	1.18
52	1	EA	1.18	1.18
53	1	EA	1.18	1.18
54	1	EA	1.18	1.18
55	1	EA	1.18	1.18
56	1	EA	1.18	1.18
57	1	EA	1.18	1.18
58	1	EA	1.18	1.18
59	1	EA	1.18	1.18
60	1	EA	1.18	1.18
61	1	EA	1.18	1.18
62	1	EA	1.18	1.18
63	1	EA	1.18	1.18
64	1	EA	1.18	1.18
65	1	EA	1.18	1.18
66	1	EA	1.18	1.18
67	1	EA	1.18	1.18
68	1	EA	1.18	1.18
69	1	EA	1.18	1.18
70	1	EA	1.18	1.18
71	1	EA	1.18	1.18
72	1	EA	1.18	1.18
73	1	EA	1.18	1.18
74	1	EA	1.18	1.18
75	1	EA	1.18	1.18
76	1	EA	1.18	1.18
77	1	EA	1.18	1.18
78	1	EA	1.18	1.18
79	1	EA	1.18	1.18
80	1	EA	1.18	1.18
81	1	EA	1.18	1.18
82	1	EA	1.18	1.18
83	1	EA		

CONTRACTS. 0.0332 0.6039 0.9147 0.7115

[illegible]

	Accessions	0.8398	0.9796	0.8529	0.4661	0.2193	0.1329	0.1199	0.0657	0.0609
Accessions	6.2616	0.8398	0.9796	0.8529	0.4661	0.2193	0.1329	0.1199	0.0657	0.0609

[illegible]

QIN74S	0.0290	0.0210	0.0020	0.3160	0.1040	0.0850	0.0450	0.0750
1.0460								

[illegible]

RECRUITING/NOVY-RECRUITING FORM AND DETAILED REPORT FOR AREA OPTIMIZATION

10/15/2008 9:55 AM JUN 08 588

ADVERTISING 0.9719

RECRUITING 12.5913

TOTAL COST 13.5632

CONTRACTS 0.0333

INITIALS 1.3812

ACCESSIONS 0.7696

W/201 0.0400

QUINTAS 0.0100

SHORTFALLS 0.0

0.0031

0.0308

0.0524

0.2531

0.0449

0.0400

0.0100

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

RECRUITING COMMAND

TOTAL FOR FEBRUARY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
ADVERTISING	0.7171	0.0098	0.0140	0.0488	0.0455	0.0469	0.0469	0.0488	0.0852
RECRUITING	0.2970	0.7742	0.7742	0.7742	0.7742	0.7742	0.7742	0.7742	0.7742
TOTAL COST (MILLION \$)	10.0081	0.7765	0.7883	0.8231	0.8198	0.8212	0.8212	0.8231	0.8594
CONTRACTS	0.1012	0.3660	0.4642	0.6219	0.6327	0.6102	0.4914	0.4130	0.5295
INITIAL DELAY	0.9831	0.3176	0.1500	0.0802	0.0445	0.0407	0.0276	0.0271	0.1594
ACCESSIONS	0.0677	0.1716	0.2281	0.3379	0.3288	0.3333	0.2790	0.3441	0.6133
TOTAL ECTIONS	0.0297	0.0193	0.0148	0.0102	0.0133	0.0139	0.0066	0.0112	0.0717
QUOTAS	1.7160	0.5190	0.2230	0.1390	0.0740	0.1230	0.0500	0.0510	0.2810
SHORTFALLS	0.0297	0.0297	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RECRUITING AND ADVERTISING COSTS DETAILED REPORT FOR YEAR

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
TOTAL FOR HORIZON	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ADVERTISING	0.7171	0.0285	0.1333	0.1369					
RECRUITING	0.2910	0.7762	0.7762	0.7762					
TOTAL COST (MILLION \$)	10.0000	0.7728	0.9077	0.9132					
CONTRACTS	0.1812	0.5115	0.0827	0.2919					
INITIAL DELAY	0.2891	0.0268	0.0181	0.0021	0.0000	0.0000	0.0000	0.0000	0.0000
ACCESSIONS	0.8677	0.2496	0.7027	0.5985	0.1634	0.0989	0.0685	0.0490	0.0449
TOTAL ACCESSIONS	0.8677	0.2496	0.7027	0.5985	0.1634	0.0989	0.0685	0.0490	0.0449
QUOTAS	1.7160	0.0480	0.0340	0.0030	0.2230	0.1710	0.1390	0.0740	0.1230
SHORTFALLS	0.0297	0.0000	0.0000	0.1682	0.0576	0.0721	0.0506	0.0250	0.0781

RECRUITING/ADVERTISING COMMAND ORGANIZATION DAILY REPORT FOR INDEX

TOTAL FOR MONTH: APR MAY JUN JUL AUG SEP

ADVERTISING 0.7171

RECRUITING 9.2910

TOTAL COST (MILLION \$) 10.0081

CONTRACTS 6.1812

INITIAL DELAY 0.9831

ACCESSIONS 5.6677

TOTAL ACCESSIONS 3.8201

QUOTAS 1.7160

SHORTFALLS 0.0297

	0.0	0.0	0.0	0.0	0.0	0.0
	0.0301	0.0299	0.1749	0.0295	0.0201	0.0023
	0.0301	0.0299	0.1749	0.0295	0.0201	0.0023
	0.0500	0.0510	0.2810	0.0580	0.0340	0.0030
	0.0199	0.0211	0.1061	0.0185	0.0139	0.0007

Note we would expect it to increase over FY79 since a higher quota is demanded, a higher terminal DEP, a lower initial DEP, a lower number of male High School seniors, and a lower unemployment rate. All of these contribute to increase the costs rough \$11 Million or about 11%. For FY80 we have the detailed results, together with the area distribution of the terminal DEP at the end of FY80.

In turn, the results could be used to initiate a run for FY81, given new quotas, new terminal DEP positions, new demographics, etc.

6.8 Numerical Illustrations for One Year Horizon for Upper Mental,
High School Accessions

The following are the inputs and outputs for a single year analysis for male, Upper Mental (i.e., Mental Category I-III Upper), High School Graduate accessions. The year in question was FY79, the quota desired was 36,063 (approximately the number obtained in FY79), an initial DEP position (for Upper Mental, HSG's) at the beginning of FY79 of 7,150 and a desired DEP position at the end of FY79 of 6,627 (both of these were approximately the actual positions in FY79). The new set of base, scenario, control and results files are given, together with the outputs.

The only significant difference (from the user's standpoint) is the addition of a new demographic, that is not included in the base file and scenario file for analyzing HSG recruits (regardless of their mental category). The new entry is called BUPMN in the base file and UPMEN in the scenario file. To illustrate, the UPMEN for August, 1978 (two months before the start of the decision horizon) is, for Area 1 (Area 100), .602755, i.e., 60.2755% of the male High School seniors in Area 1 are estimated to be of Upper Mental quality. We also note that the production elasticities are somewhat different for Upper Mental, HSG recruits than for HSG recruits in general. For example advertising and pay does not seem as effective for Upper Mental recruits as it does for HSG's in general. These are all contained in the base file and need not be of concern to the user.

The output shows that to meet this accession quota of 36,063, one needs to spend \$38.825 Million with \$2.06 Million of this on advertising (for placement costs) and \$36.763 Million (1,413 recruiter man-years) on recruiters.

BASE FILE 3714 SYB

17

[illegible]

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

The page contains dense vertical black bars forming columns across the entire area.

LISTING OF INPUT DATA

Account	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362</
---------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--------

~~EX-99, UPPER KITTEN MENTAL, H56-~~

१८

[illegible]

RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

NAVY RECRUITING COMMAND
LISTING OF INPUT DATA (INITIALIZATION OF FTY9, UPPER MENTALS, HSC6)

X0	780000	:839	:376	:830	:818	:838
Y0	78113	:835	:816	:830	:813	:838
Y0	78131	:835	:816	:830	:813	:838
Y0	78131	:835	:816	:830	:813	:838
DEPR	780000	:839	:376	:830	:818	:838
END	78	:839	:376	:830	:818	:838

READING OF INPUT DATA COMPLETE.

MATRIX GENERATION COMPLETE
1006 CARDS WRITTEN TO SCRATCH FILE NUMBER 12

NAVY RECRUITING COMMAND RECRUITING EXPENDITURE OPTIMIZATION (UPPER MENTAL) 436, FY79

	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR MONTH									
ADVERTISING	2,063	0,004	0,074	0,004	0,001	0,083	0,024	0,123	0,243
RECRUITING	34,743	3,063	3,063	3,063	3,063	3,063	3,063	3,063	3,063
TOTAL COST (MILLION \$)	36,806	3,137	3,137	3,137	3,137	3,137	3,137	3,137	3,137
CONTRACTS	37,342	2,905	3,034	2,019	3,513	3,937	2,637	2,599	3,648
INITIAL DELAY	6,822	2,021	0,027	0,028	0,293	0,496	0,190	0,208	1,130
ACCESSIONS	38,338	1,288	1,288	1,288	1,288	1,288	1,288	1,288	1,288
RETIREMENTS	36,167	3,189	2,557	2,032	2,043	2,353	1,846	2,272	4,972
QUOTAS	41,670	3,000	3,210	3,390	3,720	3,600	2,510	2,710	4,630
SHORTFALLS	5,208	0,421	0,443	0,338	0,211	0,137	0,198	0,438	0,0

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE SUMMARY REPORT FOR ALL AREAS

	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 80	JAN 80	FEB 80	MAR 80
TOTAL FOR HCR ZON	2,0621	0,1403	0,3864	0,4657					
ADVERTISING	36,7431	3,0636	3,0636	3,0636					
RECRUITING									
TOTAL COST (MILLION \$)	38,8252	3,2039	3,4500	3,5293					
CONTRACTS	37,3412	3,0777	3,0761	3,3886					
INITIAL DELAY ENTRY POOL	6,8282	0,1912	0,1366	0,0137	0,0	0,0	0,0	0,0	0,0
ACCESSIONS	30,8325	3,0331	4,3573	3,9344	2,0588	0,9961	0,6150	0,5451	0,3011
TOTAL ACCESSIONS	36,1607	4,1243	4,4939	3,9481	2,0588	0,9961	0,6150	0,5451	0,3011
QUOTAS	41,6720	4,6360	4,8770	4,5200	1,9990	0,9580	0,6820	0,5360	0,2850
SHORTFALLS	8,7905	0,8107	0,0831	0,8219	0,0	0,0	0,0470	0,0	0,1749

NAVY RECRUITING COMMAND
 RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION
 SUMMARY REPORT FOR ALL AREAS

	TOTAL FOR FISCAL YEAR	APR 80	MAY 80	JUN 80	JUL 80	AUG 80	SEP 80
ADVERTISING	2,0621						
RECRUITING	36,7631						
TOTAL COST (MILLION \$)	38,8252						
CONTRACTS	37,3412						
INITIAL DELAY ENTRY PRICE	6,8282	0.0	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	28,3325	0.1863	0.1904	1.1078	0.1828	0.1266	0.0185
TOTALS	36,1607	0.1863	0.1904	1.1078	0.1828	0.1266	0.0185
QUOTAS	41,6720	0.1920	0.1990	1.0880	0.6620	0.1320	0.0180
SHORTFALLS	5,7905	0.0057	0.0086	0.0	0.4792	0.0054	0.0

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

		OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR HORIZON										
CONTRACTS FOR REGION 1	22.8360	1.2101	2.0359	1.2609	1.5871	2.2184	2.3912	1.6697	1.6618	2.3856
CONTRACTS FOR REGION 2	5.1231	0.3847	0.3953	0.3730	0.4107	0.4307	0.4461	0.3267	0.3108	0.4275
CONTRACTS FOR REGION 3	3.6175	0.3029	0.3084	0.2903	0.3172	0.3386	0.3496	0.2563	0.2411	0.3314
CONTRACTS FOR REGION 4	1.3430	0.1202	0.1182	0.1119	0.1164	0.1235	0.1283	0.0937	0.0882	0.1220
CONTRACTS FOR REGION 5	2.0778	0.1727	0.1758	0.1654	0.1821	0.1926	0.1996	0.1471	0.1401	0.1929
CONTRACTS FOR REGION 6	2.3439	0.2099	0.2094	0.1972	0.2032	0.2155	0.2229	0.1633	0.1539	0.2104
TOTAL (1000'S)	37.3412	2.4005	3.2431	2.3988	2.8169	3.5193	3.9377	2.6367	2.5959	3.6498
ACCESSIONS FOR REGION 1	19.1056	0.9373	1.1706	0.8444	1.0676	1.0922	1.3351	1.0754	1.3508	2.6248
ACCESSIONS FOR REGION 2	5.3482	0.5878	0.3924	0.3340	0.3621	0.2850	0.3369	0.2412	0.2963	0.7006
ACCESSIONS FOR REGION 3	4.4325	0.6098	0.3677	0.3075	0.3196	0.2429	0.2974	0.2025	0.2451	0.6224
ACCESSIONS FOR REGION 4	1.8685	0.2963	0.1675	0.1384	0.1373	0.0992	0.1256	0.0809	0.0969	0.2666
ACCESSIONS FOR REGION 5	2.3664	0.2959	0.1874	0.1582	0.1688	0.1312	0.1573	0.1108	0.1358	0.3294
ACCESSIONS FOR REGION 6	3.0424	0.4509	0.2651	0.2206	0.2225	0.1638	0.2033	0.1347	0.1625	0.4285
TOTAL (1000'S)	36.1607	3.1880	2.5507	2.0032	2.2779	2.0143	2.4555	1.8456	2.2812	4.9722
QUOTAS	36.0630	3.8890	3.217	2.3389	3.2590	2.7280	2.6060	2.5190	2.7710	4.6930
SHORTFALLS	0.0	0.6210	0.6663	0.3348	0.9811	0.7137	0.1505	0.6734	0.4838	0.0

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

	TOTAL FOR HORIZON	JUL 79	AUG 79	SEP 79
CONTRACTS FOR REGION 1	22.8359	1.9798	2.2366	2.0645
CONTRACTS FOR REGION 2	5.1231	0.3676	0.6376	0.6129
CONTRACTS FOR REGION 3	3.6175	0.2849	0.3126	0.2843
CONTRACTS FOR REGION 4	1.3430	0.1039	0.1133	0.1034
CONTRACTS FOR REGION 5	2.0378	0.1649	0.1802	0.1640
CONTRACTS FOR REGION 6	2.3439	0.1805	0.1977	0.1799
TOTAL (1000'S)	37.3612	3.0772	3.6761	3.3886
ACCESSIONS FOR REGION 1	19.1056	2.4789	2.7149	2.4135
ACCESSIONS FOR REGION 2	5.3482	0.5319	0.6572	0.6100
ACCESSIONS FOR REGION 3	4.4325	0.4274	0.4321	0.3581
ACCESSIONS FOR REGION 4	1.8685	0.1666	0.1636	0.1317
ACCESSIONS FOR REGION 5	2.3664	0.2411	0.2459	0.2058
ACCESSIONS FOR REGION 6	3.0624	0.2805	0.2812	0.2289
TOTAL (1000'S)	36.1607	4.1243	4.4939	3.9481
SHORTFALLS	36.0630	4.6350	4.5770	4.5200
SHORTFALLS	0.0	0.5107	0.0831	0.5719

NAVY RECRUITING COMMAND OPTIMIZATION

	Q1	Q2	Q3	Q4	MAY 80	JUN 80
TOTAL FOR POST-HORIZON	6.1121	1.2895	0.4226	0.3861	0.3398	0.1176
ACCESSIONS FOR REGION 1	0.9730	0.3067	0.1399	0.0868	0.0788	0.0302
ACCESSIONS FOR REGION 2	0.5981	0.1910	0.0907	0.0551	0.0491	0.0165
ACCESSIONS FOR REGION 3	0.2184	0.0699	0.0331	0.0202	0.0179	0.0060
ACCESSIONS FOR REGION 4	0.3448	0.1098	0.0521	0.0317	0.0284	0.0095
ACCESSIONS FOR REGION 5	0.3802	0.1218	0.0517	0.0351	0.0312	0.0105
ACCESSIONS FOR REGION 6	0.3802	0.1218	0.0517	0.0351	0.0312	0.0105
TOTAL (1000'S)	6.6266	2.0588	0.9961	0.6150	0.5451	0.1904
QUOTAS	6.6270	1.9990	0.8590	0.6820	0.5360	0.1920
SHORTFALLS	0.0004	0.0	0.0	0.0670	0.0	0.0086

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION

TOTAL FOR POST-HORIZON JUL 80 AUG 80 SEP 80

ACCESSIONS FOR REGION 1 4.1121 0.1130 0.0769 0.0088

ACCESSIONS FOR REGION 2 0.9730 0.0289 0.0221 0.0026

ACCESSIONS FOR REGION 3 0.5981 0.0189 0.0107 0.0012

ACCESSIONS FOR REGION 4 0.2184 0.0058 0.0039 0.0004

ACCESSIONS FOR REGION 5 0.3448 0.0092 0.0062 0.0001

ACCESSIONS FOR REGION 6 0.3802 0.0101 0.0068 0.0008

TOTAL (1000'S) 6.6266 0.1828 0.1262 0.0165

QUINTAS 6.6210 0.6620 0.1320 0.0130

SHORTFALLS 0.0004 0.4792 0.0054 0.0

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION (UPPER MENTAL HSG)

TOTAL FOR HORIZON	OCT 78	NOV 78	DEC 79	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
ADVERTISING	1.7502	0.0001	0.0001	0.0008	0.0030	0.4036	0.0421	0.1422	0.2410
RECRUITING	22.5038	1.8820	1.8820	1.8820	1.8820	1.8820	1.8820	1.8820	1.8820
TOTAL COST (MILLION \$)	24.3340	1.8820	1.8820	1.8820	1.8820	2.2856	1.9241	2.0242	2.1230
CONTRACTS	22.0359	1.2101	1.2609	1.5871	2.2184	2.5912	1.6497	1.6618	2.3656
INITIAL DELAY ENTRY POOL	1.2243	0.3697	0.1224	0.0992	0.0526	0.0882	0.0355	0.0367	0.1996
ACCESSIONS	17.8812	0.5676	1.0115	0.2220	0.8485	1.2469	1.0399	1.3140	2.6252
REPLENISHMENTS	19.1056	0.9373	1.1706	1.0674	1.0922	1.3351	1.0754	1.3508	2.6248
QUOTAS	13.0680	1.1040	1.0100	1.0220	0.8590	0.8220	0.7950	0.8730	1.4460
SHORTFALLS	0.2567	0.2567	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NAVY RECRUITING COMMAND RECRUITING ADVERTISING EXPENDITURE OPTIMIZATION OPTIMIZED REPORT FOR AREA 1

	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 80	JAN 80	FEB 80	MAR 80
TOTAL FOR HCRIZON									
ADVERTISING	1.7502	0.1400	0.2676	0.2756					
RECRUITING	22.5838	1.8820	1.8820	1.8820					
TOTAL COST (MILLION \$)	24.3340	2.0220	2.1496	2.1576					
CONTRACTS	22.8359	1.9758	2.2346	2.0445					
INITIAL DELAY ENTRY POOL	1.2243	0.0343	0.0245	0.0024	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	17.8812	2.4446	2.6904	2.4111	1.2595	0.4226	0.3861	0.3398	0.1890
RECESSIONS	19.1056	2.4789	2.7149	2.6135	1.2595	0.6226	0.3861	0.3398	0.1921
QUOTAS	19.0680	1.4460	1.4390	1.4210	0.5430	0.2340	0.1800	0.1450	0.1300
SHORTFALLS	0.2567	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING/CONTRACTS/INITIAL DELAY DETAILED REPORT FOR AREA

TOTAL FOR APR 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 1,7502

RECRUITING 22,5838

TOTAL COST (MILLION \$) 24,3360

CONTRACTS 22,8359

INITIAL DELAY 1,2243

ENTRANCE POOL 0.0

ACCESSIONS 17,8812

19,1056

QUOTAS 13,0680

SHORTFALLS 0.2567

NAVY RECRUITING COMMAND

DATE: 11/11/2009

NAVY, RECRUITING COMMAND
ADVERTISING EXPENDITURE
DETAILED REPORT FOR AREA

TOTAL FOR		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
HORIZON		79	79	79	79	79	80	80	80	80

ADVERTISING	0.3090	0.0001	0.1186	0.1098
-------------	--------	--------	--------	--------

RECRUITING 5.2118 0.4343 0.4343 0.4343

TOTAL COST	5.5205	0.4346	0.5528	0.6261
(MILLION \$)				

CONTRACTS	2,1231	0,3676	0,6376	0,6124

INITIAL DELAY	1.3819	0.0387	0.0276	0.0028
---------------	--------	--------	--------	--------

ACCESSIONS 1.9636 0.4932 0.6296 0.4072

NO.	DATE	DESCRIPTION	AMOUNT	BALANCE
1	1/1/52	TO BALANCE	0.00	0.00
2	1/15/52	BY CHECK	0.50	0.50
3	2/1/52	BY CHECK	0.50	1.00
4	2/15/52	BY CHECK	0.50	1.50
5	3/1/52	BY CHECK	0.50	2.00
6	3/15/52	BY CHECK	0.50	2.50
7	4/1/52	BY CHECK	0.50	3.00
8	4/15/52	BY CHECK	0.50	3.50
9	5/1/52	BY CHECK	0.50	4.00
10	5/15/52	BY CHECK	0.50	4.50
11	6/1/52	BY CHECK	0.50	5.00
12	6/15/52	BY CHECK	0.50	5.50
13	7/1/52	BY CHECK	0.50	6.00
14	7/15/52	BY CHECK	0.50	6.50
15	8/1/52	BY CHECK	0.50	7.00
16	8/15/52	BY CHECK	0.50	7.50
17	9/1/52	BY CHECK	0.50	8.00
18	9/15/52	BY CHECK	0.50	8.50
19	10/1/52	BY CHECK	0.50	9.00
20	10/15/52	BY CHECK	0.50	9.50
21	11/1/52	BY CHECK	0.50	10.00
22	11/15/52	BY CHECK	0.50	10.50
23	12/1/52	BY CHECK	0.50	11.00
24	12/15/52	BY CHECK	0.50	11.50
25	1/1/53	BY CHECK	0.50	12.00
26	1/15/53	BY CHECK	0.50	12.50
27	2/1/53	BY CHECK	0.50	13.00
28	2/15/53	BY CHECK	0.50	13.50
29	3/1/53	BY CHECK	0.50	14.00
30	3/15/53	BY CHECK	0.50	14.50
31	4/1/53	BY CHECK	0.50	15.00
32	4/15/53	BY CHECK	0.50	15.50
33	5/1/53	BY CHECK	0.50	16.00
34	5/15/53	BY CHECK	0.50	16.50
35	6/1/53	BY CHECK	0.50	17.00
36	6/15/53	BY CHECK	0.50	17.50
37	7/1/53	BY CHECK	0.50	18.00
38	7/15/53	BY CHECK	0.50	18.50
39	8/1/53	BY CHECK	0.50	19.00
40	8/15/53	BY CHECK	0.50	19.50
41	9/1/53	BY CHECK	0.50	20.00
42	9/15/53	BY CHECK	0.50	20.50
43	10/1/53	BY CHECK	0.50	21.00
44	10/15/53	BY CHECK	0.50	21.50
45	11/1/53	BY CHECK	0.50	22.00
46	11/15/53	BY CHECK	0.50	22.50
47	12/1/53	BY CHECK	0.50	23.00
48	12/15/53	BY CHECK	0.50	23.50
49	1/1/54	BY CHECK	0.50	24.00
50	1/15/54	BY CHECK	0.50	24.50
51	2/1/54	BY CHECK	0.50	25.00
52	2/15/54	BY CHECK	0.50	25.50
53	3/1/54	BY CHECK	0.50	26.00
54	3/15/54	BY CHECK	0.50	26.50
55	4/1/54	BY CHECK	0.50	27.00
56	4/15/54	BY CHECK	0.50	27.50
57	5/1/54	BY CHECK	0.50	28.00
58	5/15/54	BY CHECK	0.50	28.50
59	6/1/54	BY CHECK	0.50	29.00
60	6/15/54	BY CHECK	0.50	29.50
61	7/1/54	BY CHECK	0.50	30.00
62	7/15/54	BY CHECK	0.50	30.50
63	8/1/54	BY CHECK	0.50	31.00
64	8/15/54	BY CHECK	0.50	31.50
65	9/1/54	BY CHECK	0.50	32.00
66	9/15/54	BY CHECK	0.50	32.50
67	10/1/54	BY CHECK	0.50	33.00
68	10/15/54	BY CHECK	0.50	33.50
69	11/1/54	BY CHECK	0.50	34.00
70	11/15/54	BY CHECK	0.50	34.50
71	12/1/54	BY CHECK	0.50	35.00
72	12/15/54	BY CHECK	0	

QUOTAS 9.8450 1.0570 1.0550 1.0210

SHORTFALLS	0.5251	0.3978	0.6110
6.6998			

Journal of Management Education 33(1) 10-11
© 2009 Sage Publications
10.1177/0022032108325611
jme.sagepub.com
hosted at
http://online.sagepub.com

100

1. The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) tend to zero as $t \rightarrow \infty$ if and only if the matrix A is Hurwitz. The second part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$ if the matrix A is not Hurwitz. It is shown that the solutions of the system (1) tend to infinity as $t \rightarrow \infty$ if and only if the matrix A is not Hurwitz. The third part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$ if the matrix A is not Hurwitz and the matrix B is not zero. It is shown that the solutions of the system (1) tend to infinity as $t \rightarrow \infty$ if and only if the matrix A is not Hurwitz and the matrix B is not zero.

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

[illegible]

(This page is intentionally left blank.)

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

1. The first part of the document is a list of names and their corresponding page numbers. The names are listed in a single column, and the page numbers are listed in a single column to the right of the names. The names are: J. A. B. C. D. E. F. G. H. I. J. K. L. M. N. O. P. Q. R. S. T. U. V. W. X. Y. Z. The page numbers are: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819

1. The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow \infty$ if the matrix A is stable. The second part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$ if the matrix A is not stable. It is shown that the solutions of the system (1) are unbounded and tend to infinity as $t \rightarrow \infty$ if the matrix A is not stable.

.....

100

[illegible][illegible]

RECRUITING DATA REPORT FOR AREA 2
 MONTHLY DATA FOR 1980

	APR 80	MAY 80	JUN 80	JUL 80	AUG 80	SEP 80
TOTAL FOR HARRIS						
ADVERTISING	0.3090					
RECRUITING	5.2115					
TOTAL COST (MILLION \$)	5.5205					
CONTRACTS	5.1231					
INITIAL DELAY ENTRY POOL	1.3619	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	3.9634	0.0237	0.0302	0.1710	0.0289	0.0026
QUOTAS	3.3452	0.0237	0.0302	0.1710	0.0289	0.0026
SHORTFALLS	4.4998	0.0353	0.0308	0.1620	0.0281	0.0014

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 3

	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR HORIZON									
ADVERTISING	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
RECRUITING	3.5660	0.2672	0.2972	0.2972	0.2972	0.2972	0.2972	0.2972	0.2972
TOTAL COST (MILLION \$)	3.5667	0.2972	0.2972	0.2972	0.2972	0.2972	0.2972	0.2972	0.2972
CONTRACTS	3.6175	0.3029	0.3044	0.3172	0.3386	0.3496	0.2563	0.2411	0.3314
INITIAL DELAY ENTRY POOL	1.5490	0.4610	0.2014	0.1549	0.0666	0.1115	0.0449	0.0465	0.2525
ACCESSIONS	2.8835	0.1420	0.1643	0.1526	0.1763	0.1898	0.1576	0.1986	0.3699
REPLENISHMENTS	5.4325	0.6008	0.3477	0.3196	0.2429	0.2975	0.2025	0.2451	0.6224
QUOTAS	12.5480	1.1470	0.9720	0.7030	0.9850	0.7810	0.7630	0.8390	1.3960
SHORTFALLS	8.1185	0.5372	0.6063	0.3955	0.6654	0.4836	0.5605	0.5939	0.7736

NAVY RECRUITING COMMAND RECRUITING ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 3

	TOTAL FOR MCH 79	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 80	JAN 80	FEB 80	MAR 80
ADVERTISING	0.0007	0.0001	0.0001	0.0001						
RECRUITING	3.5660	0.2972	0.2972	0.2972	0.2972					
TOTAL COST (MILLION \$)	3.5667	0.2972	0.2972	0.2972	0.2972					
CONTRACTS	3.6175	0.2849	0.3126	0.2843						
INITIAL DELAY ENTRY POOL	1.5490	0.0434	0.0310	0.0031	0.0	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	2.8835	0.3840	0.4011	0.3850	0.3910	0.0907	0.0551	0.0491	0.0271	0.0269
RELEASES	1.4325	0.1274	0.1321	0.3581	0.1910	0.0907	0.0551	0.0491	0.0271	0.0269
QUOTAS	12.5480	1.3940	1.3800	1.3630	0.6870	0.2960	0.2280	0.1840	0.0990	0.1640
SHORTFALLS	8.1155	0.9666	0.9479	1.0049	0.6960	0.2033	0.1729	0.1349	0.0719	0.1371

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 3

TOTAL FOR HORIZON APR 80 MAY 80 JUN 80 JUL 80 AUG 80 SEP 80

ADVERTISING 0.0007

RECRUITING 3.5660

TOTAL COST (MILLION \$) 3.5667

CONTRACTS 3.6175

INITIAL DELAY ENTRY POOL 1.5490 0.0 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 2.8838 0.0170 0.0165 0.0667 0.0159 0.0107 0.0012

TOTAL ACCESSIONS 1.4325 0.0170 0.0165 0.0967 0.0159 0.0107 0.0012

QUOTAS 12.5480 0.0660 0.0680 0.3790 0.0660 0.0460 0.0050

SHORTFALLS 8.1155 0.0490 0.0515 0.2763 0.0481 0.0359 0.0038

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 9

	QCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
TOTAL FOR HORIZEN	78	78	79	79	79	79	79	79	79
ADVERTISING	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
RECRUITING	1.2238	0.1020	0.1020	0.1020	0.1020	0.1020	0.1020	0.1020	0.1020
TOTAL COST (MILLION \$)	1.2245	0.1020	0.1020	0.1020	0.1020	0.1020	0.1020	0.1020	0.1020
CONTRACTS	1.3430	0.1202	0.1182	0.1119	0.1164	0.1235	0.1283	0.0937	0.1220
INITIAL DELAY ENTRY POOL	0.7946	0.2400	0.1033	0.0795	0.0644	0.0342	0.0572	0.0230	0.1295
ACCESSIONS	1.0760	0.0366	0.0642	0.0590	0.0730	0.0650	0.0684	0.0379	0.1370
EXECSIONS	1.0685	0.2363	0.1675	0.1384	0.1373	0.0992	0.1256	0.0809	0.2666
QUINTAS	9.5210	0.8300	0.7000	0.5060	0.7090	0.5960	0.5720	0.6200	1.1260
SHORTEALLS	7.6525	0.8337	0.5325	0.3676	0.5717	0.4948	0.4466	0.4671	0.8594

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA

	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 80	JAN 80	FEB 80	MAR 80
TOTAL FOR RECRUITING	0.0007	0.0001	0.0001	0.0001					
ADVERTISING	1.2238	0.1020	0.1020	0.1020					
RECRUITING	1.2245	0.1020	0.1020	0.1020					
TOTAL COST (MILLION \$)									
CONTRACTS	1.3430	0.1039	0.1133	0.1034					
INITIAL DELAY	0.7946	0.0222	0.0159	0.0016	0.0	0.0	0.0	0.0	0.0
ENTRY POOL	1.0740	0.1423	0.1471	0.1301	0.0599	0.0202	0.0179	0.0099	0.0099
ACCESSIONS	1.9685	0.1646	0.1636	0.1317	0.0699	0.0202	0.0179	0.0099	0.0099
DETERMINATIONS	9.5210	1.1180	1.0900	1.1080	0.3990	0.1170	0.0950	0.0500	0.0840
QUOTAS	7.6525	0.9836	0.9266	0.9263	0.2831	0.0368	0.0171	0.0401	0.0741
SHORTFALLS									

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 4

	APR 80	MAY 80	JUN 80	JUL 80	AUG 80	SEP 80
TOTAL FOR HORTZCN	0.0007					
ADVERTISING	0.0007					
RECRUITING	1.2238					
TOTAL COST (MILLION \$)	1.2245					
CONTRACTS	1.3430					
INITIAL DELAY ENTRY POOL	0.0	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	0.0062	0.0060	0.0352	0.0038	0.0038	0.0004
QUOTAS	0.0062	0.0060	0.0352	0.0038	0.0038	0.0004
SHORTFALLS	0.0340	0.0350	0.1810	0.0330	0.0230	0.0020
	0.0278	0.0290	0.1558	0.0232	0.0191	0.0016

RECRUITING

ADVERTISING

INITIAL DELAY ENTRY POOL

ACCESSIONS

QUOTAS

SHORTFALLS

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 5

		OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR MONTH										
ADVERTISING	0.007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
RECRUITING	2.0086	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676
TOTAL COST (MILLION \$)	2.0093	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676
CONTRACTS	2.0778	0.1727	0.1759	0.1654	0.1823	0.1926	0.1996	0.1471	0.1401	0.1929
INITIAL DELAY ENTRY POOL	0.7115	0.2149	0.0925	0.0711	0.0576	0.0306	0.0512	0.0206	0.0213	0.1160
ACCESSIONS	1.6560	0.0810	0.0949	0.0870	0.1112	0.1006	0.1060	0.0902	0.1144	0.2134
TOTAL	2.3664	0.2959	0.1874	0.1582	0.1688	0.1312	0.1573	0.1108	0.1358	0.3294
QUOTAS	7.5280	0.6910	0.6820	0.4170	0.5890	0.6910	0.4660	0.6520	0.4990	0.8460
SHORTFALLS	5.1416	0.3961	0.3846	0.2588	0.2202	0.3598	0.3087	0.3612	0.3632	0.566

441

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA 5

	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 80	JAN 80	FEB 80	MAR 80
TOTAL FOR HORIZON	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ADVERTISING	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
RECRUITING	2.0086	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676
TOTAL COST (MILLION \$)	2.0093	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676	0.1676
CONTRACTS	2,0778	0,1649	0,1802	0,1640					
INITIAL DELAY ENTRY POOL	0,7115	0,0199	0,0152	0,0014	0,0	0,0	0,0	0,0	0,0
ACCESSIONS	1.6550	0.2212	0.2307	0.2044	0.1099	0.0521	0.0284	0.0156	0.0156
TOTAL ACCESSIONS	2,3664	0,2411	0,2449	0,2058	0,1099	0,0521	0,0284	0,0156	0,0156
QUINTAS	7.5280	0.8440	0.8310	0.8200	0.3160	0.1360	0.1040	0.0950	0.0750
SHORTFALLS	3.1616	0.6028	0.5861	0.6162	0.2061	0.0830	0.0723	0.0566	0.0594

NAVY RECRUITING COMMAND
RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION
DETAILED REPORT FOR AREA 3

	APR 80	MAY 80	JUN 80	JUL 80	AUG 80	SEP 80
TOTAL FOR HORIZON	0.0007					
ADVERTISING	0.0007					
RECRUITING	2.0096					
TOTAL COST (MILLION \$)	2.0093					

ADVERTISING 0.0007

RECRUITING 2.0096

TOTAL COST (MILLION \$) 2.0093

CONTRACTS 2.0778

INITIAL DELAY ENTRY POOL 0.7115 0.0 0.0 0.0 0.0 0.0 0.0

ACCESSIONS 1.6550 0.0008 0.0008 0.0050 0.0002 0.0062 0.0007

ADDITIONS 2.3664 0.0058 0.0095 0.0559 0.0092 0.0062 0.0007

QUOTAS 7.5280 0.0300 0.0310 0.1720 0.0290 0.0210 0.0020

SHORTFALLS 5.1616 0.0202 0.0215 0.1161 0.0198 0.0148 0.0013

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE OPTIMIZATION DETAILED REPORT FOR AREA A

	OCT 78	NOV 78	DEC 78	JAN 79	FEB 79	MAR 79	APR 79	MAY 79	JUN 79
TOTAL FOR MONTH									
ADVERTISING	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
RECRUITING	2.1605	0.1808	0.1808	0.1808	0.1808	0.1808	0.1808	0.1808	0.1808
TOTAL COST MONTH	2.1702	0.1808	0.1808	0.1808	0.1808	0.1808	0.1808	0.1808	0.1808
CONTRACTS	2.3439	0.2099	0.1972	0.2032	0.2155	0.2229	0.1633	0.1539	0.2104
INITIAL DELAY ENTRY POOL	1.1670	0.3524	0.1167	0.0945	0.0502	0.0840	0.0338	0.0350	0.1902
ACCESSIONS	1.8756	0.0886	0.1039	0.1280	0.1137	0.1192	0.1009	0.1274	0.2383
DEDUCTIONS	3.0524	0.4509	0.2206	0.2225	0.1638	0.2033	0.1347	0.1625	0.4285
QUOTAS	10.5530	0.9810	0.6070	0.8380	0.6980	0.6720	0.6440	0.7040	1.1630
SHORTFALLS	7.8106	0.5301	0.5609	0.3866	0.6155	0.4687	0.5083	0.5415	0.7345

NAVY RECRUITING COMMAND RECRUITING/ADVERTISING EXPENDITURE DETAILED REPORT FOR AREA 6

	JUL 79	AUG 79	SEP 79	OCT 79	NOV 79	DEC 80	JAN 80	FEB 80	MAR 80
TOTAL FOR HORIZON	0.0007	0.0001	0.0001	0.0001					
ADVERTISING	0.0007	0.0001	0.0001	0.0001					
RECRUITING	2.1685	0.1808	0.1808	0.1808					
TOTAL COST (MILLION \$)	2.1702	0.1808	0.1808	0.1808					
CONTRACTS	2.3439	0.1805	0.1977	0.1799					
INITIAL DELAY	1.1670	0.0327	0.0233	0.0023	0.0	0.0	0.0	0.0	0.0
ENTRANCE	1.8754	0.2478	0.2578	0.2266	0.1218	0.0377	0.0312	0.0172	0.0171
ACCESSIONS	3.0424	1.2805	0.2812	0.2289	0.1218	0.0377	0.0312	0.0172	0.0171
QUOTAS	10.5930	1.1640	1.1600	1.1160	0.5190	0.2230	0.1390	0.0740	0.1230
SHORTFALLS	7.5106	0.8835	0.8588	0.8871	0.3972	0.1653	0.1078	0.0568	0.1059

NAVY RECRUITING COMMAND RECRUITING ADVANCED EXPENDITURE OPTIMIZATION DETAILED MONTHLY COST FOR AREA 6

	APR 80	MAY 80	JUN 80	JUL 80	AUG 80	SEP 80
TOTAL FOR HORIZON						
ADVERTISING	0.0007					
RECRUITING	2.1698					
TOTAL COST (MILLION \$)	2.1702					
CONTRACTS	2.3439					
INITIAL DELAY ENTRY POOL	0.0	0.0	0.0	0.0	0.0	0.0
ACCESSIONS	1.8754	0.0108	0.0105	0.0012	0.0012	0.0008
TOTAL ACCESSIONS	3.0426	0.0108	0.0105	0.0012	0.0012	0.0008
QUITTANCES	10.5530	0.0500	0.0510	0.0480	0.0340	0.0030
SHORTFALLS	7.5104	0.0392	0.0405	0.0198	0.0372	0.0022

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER ONR-200-2	2. GOVT ACCESSION NO. AD-A114 009	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A MULTI-YEAR BUDGET GENERATION PROGRAM FOR USE IN NAVY RECRUITING		5. TYPE OF REPORT & PERIOD COVERED
7. AUTHOR(s) Richard C. Morey		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Center for Applied Business Research Graduate School of Business Administration Duke University, Durham, NC 27706		8. CONTRACT OR GRANT NUMBER(s) N00014-80-C-0200
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research, Code 452 800 N. Quincy Street Arlington, VA 22217		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 170-903, 62763N, RF 55521002
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE October, 1981
		13. NUMBER OF PAGES
		15. SECURITY CLASS. (of this report)
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Distribution of this document is unlimited. Reproduction in whole or in part is permitted for any purpose of the U.S. Government.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Supported by the Naval Research Manpower R&D Program.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Budget, Planning, Scenarios, Multi-Year, Accession Quotas, Demographics, Delayed Entry Pool, Optimization, Recruiters, Advertising		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This research describes and illustrates a non-linear optimization approach, installed at Navy Headquarters for generating the minimum budget to meet the various accession quotas. It can be operated for a multi-year scenario and meets yearly or monthly requirements for quality accessions and for the size of the Delayed Entry Pool. It splits the derived budget between the recruiters and advertising, allocates the recruiters to districts, determines the geograph- ical mix and timing of advertising expenditures and generates the optimal flow of enlistment contracts. It can be used to help explore the inputs of varying		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0103-014-66011

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)		5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE
		13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
quotas, initial conditions, economic scenarios, cost per recruiter, attraction in the Delayed Entry Program, and demographics. Budget runs for FY79 are included.		

DD FORM 1473
1 JAN 73

EDITION OF 1 NOV 63 IS OBSOLETE
S/N 0103-014-6601

ATE
LME
-8