THE UNITED STATES FOREIGN SERVICE, A PERSONNEL MODEL

by

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ABSTRACT

Much has been written about the decline and fall of the State Department and its principle policy branch, the Foreign Service. This paper does not address itself to the great issues, but suggests a way to use in a better way the Department of State's most critical resource: the men and women of the United States Foreign Service.

The 1960s saw a movement for reform of the personnel system develop from within the Foreign Service. There was a flurry of activity during the elections in 1968 which led to a major study in 1969 and 1970. Many of the recommendations which resulted from the study have been implemented, but a large number of employees continue to feel that more reforms are needed. Employee groups are pressuring the administration for action on many policies while, perhaps, not completely understanding the full ramifications of the results of their demands were they put into effect. Clearly, the situation calls for the use of simulation, but the Department does not yet have a working personnel model.

This paper proposes a personnel model for the Foreign Service. The model has been constructed in Systems Dynamics and uses the simulation language, DYNAMO. Hopefully, it will allow a noncomputer specialist to test policies in retirement, resignations, selection-out (firing), promotion, recruiting, and lateral entry with very little preparation. The options offered can be combined into over 36,000 possible personnel policies within the current legislative framework governing the Foreign Service.

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Title: Associate Professor of Political Science

PREFACE

I am a member of the "striped-pants elite" formally known as the Foreign Service. I am approaching my eighth year in this strange organization which reminds me of a mixture of the British military officer class of the 1890s and the faculty of a modern supersized campus. Neither can be very well analyzed, and both are impossible to administrate, but somehow they manage to muddle through in a rather glorious style which does not necessarily reflect their worth to society.

Perhaps I exaggerate, but I feel that the personnel system of the Foreign Service has changed at least eight times in my eight years, and it seems strange to me that my colleagues want to change it again. Although I do not agree with Ambassador Briggs that the Foreign Service is over administered (he called me and my fellow administrators "pant-pressers"), I do feel that we should let one system, any system, run awhile to see if it works.

Nevertheless, I must earn my wages and not an iron is in sight, so I have used the one machine that is overwhelmingly available at M.I.T., the computer. I hope that my use of the computer will not lead to another change in the personnel system, but rather give a tool to my colleagues so that they may examine the Foreign Service to their heart's content while the rest of us digest last week's reform.

This paper is a direct follow-through to a thesis written at M.I.T. in 1970 by Ed Parsons. I owe a good deal of thanks to Ed for the idea and his assistance from the home office. I do not intend to discuss the background and justification for my model in any detail. Further information

and history on the Foreign Service personnel system and its link with foreign policy may be found in Parsons' excellent paper. (See the bibliography for further details.)

The Department of State gave me this year to be "recycled" (so it is called in French). I am very grateful to Dr. Choucri for putting me straight on the academic approach after so many years away from campus, and to Judi Mason for her editorial help on my other foreign language, Governmentese.

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CHAPTER I

"CRIES OF 'OH!'"

The art of debate had reached a state of fine art in Gladstone's England. To read the parliamentary debates in the daily press was considered the best entertainment of the times. Sometimes a skillfully placed barb evoked a response of less than a respectful nature. Such responses were noted in the record as "Cries of 'Oh!'" Perhaps this preserved the dignified image of Victorian England, but it did not bear its soul.

> I want the head of every Federal agency to explore and apply all possible means to
> -- use the electronic computer to do a better job
> -- manage computer activity at the lowest possible cost.
> I want my administration to give priority emphasis to both of these objectives--nothing else will suffice.[1]

> Despite the competency of many Foreign Service Officers, there is probably no group, as a whole, within the U.S. Government less disposed toward systematic decision making than the senior members of that corps--officials who either head or dominate missions abroad. By background, by experience, by selection within the system, they have been trained mostly in the liberal arts, have mostly served for much of their careers as generalists and political officers (as distinct from being specialists in administration, intelligence, or information), and have been selected for promotion in part because they are not specialists in any particular field; it would be surprising if this group had characteristics different from those that they possess.[2]

> First, by way of background, I want to say that I make no pretense of being a theoritician or scientific thinker in

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[1]Lyndon B. Johnson, Memorandum for Heads of Departments and Agencies, June 28, 1966.

[2]Henry S. Rowen and Albert P. Williams, Jr., "Policy Analysis in International Affairs," The Analysis and Evaluation of Public Expenditures: The PPB System, U.S. Congress, 91st Cong., 1st Sess., 1969, Vol. III, p. 1001. Cited from Edmund M. Parsons, "Personnel for Diplomacy: Optimizing Resource Allocation," Research Paper, Center for Advanced Engineering Study, Massachusetts Institute of Technology, 1968, p. 49.

> this whole field of government administration, but have always operated pragmatically, trying to do what it seemed to me needed to be done in whatever way seemed most practical. I do not say this in any disparagement of those who have developed the PPBS or other undoubtedly valuable tools of management, but rather to say that my own bent of mind does not normally run in such directions.[3]

There is presently a call for reform of the Foreign Service personnel system. This author cannot remember when there has not been such a call, and the record reveals that there has always been a cry for reform in the Foreign Service.

Our government is eventually responsive to the demands of reasonable men and we have had reform. The Act of August 18, 1856, Executive Order (1895), Executive Order (1905), Act of April 5, 1906, Executive Order (1906), Executive Order (1909), Stone-Flood Act (1915), Bloom Bill (1945), Manpower Act (1946), Foreign Service Act (1946), and the Act of May 26, 1949 changed the Foreign Service by widely varying degrees. Since 1949, there have been many more changes which have not required legislation but which have greatly modified the personnel system. The most significant of these was probably the actions taken on the recommendations of the Wriston Committee in 1954 through 1957. In addition to the major reforms, there have been continual administrative modifications such as centralizing, decentralizing, and recentralizing personnel.

The changes are becoming more and more frequent. Whether this is a result or the cause of a poorly functioning Foreign Service, or even if it

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[3]U. Alexis Johnson, "Memorandum on Planning-Programming-Budgeting (PPB)," Hearings, Planning-Programming-Budgeting, Part 4, Subcommittee on National Security and International Operations of the Committee on Government Operations, U.S. Senate, 90th Cong., 2nd Sess., 1968, p. 268, cited from Parsons, "Personnel for Diplomacy," p. 49.

is performing poorly, is not the subject of this paper. These matters are very well covered in the paper by Mr. Parsons, which has already been cited. The personnel model presented in this paper is an attempt to carry through a suggestion made in his thesis.

A Foreign Service employee who retires this year should perhaps be given a medal of endurance. During his thirty years of service, he has probably been raised and lowered in rank, faced with possible dismissal under three different sets of rules but not for cause, seen the growth of other agencies which embody authority that once was his, faced possible loss of his position in a personnel cutback because the growth of these other agencies made his presence overseas too conspicuous, and endured this instability without the privilege enjoyed by the personnel of these other agencies, job security through Civil Service guarantees. Perhaps you will also understand why the employees of the Foreign Service are becoming ever more militant. The system has evoked a response that can no longer be recorded as "Oh!"

The many changes of the past have left the Department of State with a mixed bag of personnel systems. On the surface, there are just two major personnel systems, the Foreign Service and the Civil Service. The Civil Service employees who remain in the United States may be readily compared to their colleagues in the other agencies of the U.S. government. This is complicated a bit because some of them hold positions which can also be held by Foreign Service employees during their assignments in the United States. However, not all Civil Service employees remain in their positions. When they go abroad, they become part of the Foreign Service,

at least temporarily. They then become Foreign Service Reserve employees. The Foreign Service is also a mixed bag of personnel systems. There are Foreign Service Officers, Foreign Service Reserve Officers, Foreign Service Reserve Officers-Unlimited, Foreign Service Staff Officers, and Foreign Service Staff employees. Another category which will not be discussed here are the Foreign Service Local employees. They are foreign nationals who work in our missions abroad and they have as many personnel systems as there are posts.

The Foreign Service Officers (FSO's) are the elite of the corps. The primary career pattern is to enter as an FSO-8 (the lowest rank) or FSO-7 and work up through the ranks to ambassador. There are career tracks or "cones" which an FSO must elect early in his career. The major "cones" are political, economic, administrative, and consular. There are other "cones," but they are minor in number. Exceptional officers labeled as high potential employees may be changed to the program direction track. It is from this track that the senior positions of importance will be filled.

The Foreign Service Reserve Officer (FSR) and Foreign Service Reserve Officer-Unlimited (FSRU) are specialists or employees whose skill will be used for a short time. The difference between FSR and FSRU is that the FSR has a limited time in which he may serve before he has to leave the service or change his status. The FSRU recognizes certain skills that are needed by the Foreign Service on a permanent basis but realizes that the person furnishing the skills is not expected to compete in the traditional diplomatic functions. An example would be the medical doctors located in several posts throughout the world.

The Foreign Service Staff Officer (FSSO) is a higher ranking Foreign Service Staff (FSS) employee. This group furnishes the technicians who keep the important support services going. They work in such fields as communications, supply, budget, and security.

Each of these groups has its unique regulation which separates it from all of the other groups. The complication they cause results from cross assignment. Every position in the Department of State now has a label stating which of the above at what rank should be assigned to it. However, given the current mix of employees, the skills (employees) do not match the requirements (positions). This is true in type of personnel (FSO, FSSO, Civil Service, etc.), rank, and functional specialty.

Faced with this rather large problem, the Department has proposed and carried through various programs to achieve some balance. The frequent changing of the regulations has not made it easy and, in fact, the goal has never been approached to any degree of satisfaction. The tragedy is that individual employees find themselves caught during adjustment periods. It is quite possible for an officer to be dismissed from the service merely because he was caught in a functional specialty which has too many employees. The overcrowding of his specialty is the fault of management, but, faced with their errors of the past, they must make adjustments to prevent further crowding in the future, make a better use of the resources, and prevent abuses to those in the other functional specialties. Therefore, while realizing that their action in dismissing the employee may be patently unfair, they will do so anyway. Clearly, this is a case for systematic analysis.

The model presented by the author suggests a possible way to begin a systematic approach to recruiting, firing, promoting, etc., of Foreign Service Officers. It does not deal with the functional specialties but solely with the Foreign Service Officers only. The author has expanded the model to deal with the specialties, but the size of the completed project makes it too cumbersome for this report. The details are discussed in Chapter II.

CHAPTER II

PARLEZ-VOUS DYNAMO?

> And the Lord said, Behold the people is one, and they have all one language; and this they begin to do; and now nothing will be restrained from them, which they have imagined to do.---Go to, let us go down, and there confound their language, that they may not understand one another's speech. Genesis, XI:6 and 7

No part of this paper has caused the author as much pain as this one. He must confess to a very limited background in computer languages. Having completed his first program in any language just six months ago, he went on to make himself an "expert" in simulation languages. Needless to say, such expertise cannot be claimed and this chapter must be taken with a grain of salt. In spite of any background, some research led to an opinion and finally a choice. You may share in the limited reasoning.

The Department of State has its ADP experts who will attempt to do most anything in assembly language. While they do a fine job, they must, perforce, rely on coordination through the systems people who have become the modern middle-men doing brokerage in information. The end-user is usually turned-off by the entire process and often gets something that pleases the ADP experts more than him. They are not to blame because he withdrew in the early stages of the game. He is not to blame because he did not understand the language spoken by this new profession. I speak of professional jargon and not computer languages.

The usual method used to bridge the gap between the programmer and the end-user is to create a higher order language that makes sense to the nontechnician. The Department of State chose COBOL. The Massachusetts

Institute of Technology does not use COBOL, a language more popular with government than business, but rather has chosen FORTRAN as its all purpose higher order language. The author went through the exercise of one simple queueing problem to see what difficulties arise in using FORTRAN as the language.

FORTRAN is a high order language which is meant to serve a wide clientele. Therefore, it contains very few functional routines which help the programmer speed along in his simulation. The effort involved in a minor queueing convinced the author that he would not talk his fellow diplomats into accepting it. In addition, it is not likely that one could justify the expense of a FORTRAN compiler when COBOL serves much the same purpose.

Simulation languages do exist. The author first tried GASP II, but soon discovered that it is based on FORTRAN causing the same conflict with COBOL. In addition, GASP II is not as easy to work with as the more popular simulation languages, such as GPSS and SIMSCRIPT.

The author then compared DYNAMO, GPSS, and SIMULA. He regrets that he did not have the time or expertise to consider SIMSCRIPT, a language fast growing in popularity but difficult to use. SIMULA was dismissed without much study because it has not gained popularity in the United States as much as in Europe. He did spend a good deal of time with GPSS and found it very useful.

GPSS would prove to be very useful in personnel simulations. It is a language for discrete simulation uses. It is based on a block diagram system, the block being called facilities, through which flows a trans-

action. The transaction may carry up to 100 attributes with it which may be altered as they pass through the facilities. It is easy to visualize the individual FSO as the transaction passing through his career with the attributes keeping track of such things as time in class, rate of promotions, number of dependents, etc. This would appear to be the best language for the purposes of the administration in the Department of State personnel offices. Keeping in mind that one purpose of the model is to let a nontechnician create his own policies, GPSS would have to be dismissed. While any one simulation model would probably be superior to its equivalent in DYNAMO, it would require a programmer to modify the model.

DYNAMO is called a continuous simulation language. In fact, it is a discrete system which "simulates" a continuous action. Some actions in personnel are discrete, such as the annual promotion list, and others are continuous, such as resignations. As it is a simulation model in which one projects his best estimates based on statistics of the past, it is acceptable to treat the continuous actions as discrete with annual reporting summing the action for the year. So, the one major item touted by "DYNAMISTS" was not important to the decision.

DYNAMO and Systems Dynamics are very easy for beginners. It is so deceptively simple that one can convince himself that he is a bit of an expert in a few weeks. His error is usually pointed out to him the first time he tries to analyze a major model or even more when he tries to build one. It was this very simplicity that led the author to use DYNAMO. If a nontechnical end-user can be shown the simple mechanics in a matter of hours, and then can produce results which are useful to him the first week

of use, he might be able to overcome his reticence in the use of the computer. The model is completed for him. He will not be faced with the second level of discovery that he himself cannot build a model. If the model is built correctly in the first place, he should have enough options to have drastically different Foreign Service personnel systems without even having to look at the specific equations.

Another attractive attribute of DYNAMO is that it is a language based on rates and levels. Built into these two basic elements is the ability to base the next decision on the last action. This feedback system is essential to the dynamic nature of the model. They also ideally fit a personnel system which speaks only of numbers of officers at each level and the rates affecting the levels, such as promotion rates, retirement rates, selection-out rates, etc.

The only language which competed for use with DYNAMO was GPSS. The latter is proprietary. DYNAMO is not a proprietary language and the compiler, provided ADP has an IBM 360/OS, costs in the neighborhood of $400. The author was not able to get a firm figure on GPSS, but figures such as $10,000 were frequently mentioned by people familiar with the field. The Department of State has advised the author that they are purchasing a DYNAMO compiler.

The model shown in this paper used the standard DYNAMO package with no major subroutines called for. The expanded model which includes functional specialities of the Foreign Service Officers required the JUMBO option. This option is included in the price mentioned above. It merely rearranges core memory to allow the computer to accept more than 1,000

equations. The expanded model contains close to 1,800 equations.

The major attraction of DYNAMO was the ability to change constants in the rerun by typing only those cards to be changed and placing them after the last card in the deck. This allows the operator to change many things with only a minimum of punching required. Each of the two additional runs attached to the model shown in this paper only required two new cards. These cards did not have to be added to the deck itself but merely placed at the end with an additional run card. This allowed the author to test three different policies of selection-out with a minimum of effort.

CHAPTER III

NOTES FROM THE UNDERGROUND

It is now time to look at the model in all of its computerized splendor. It is here that one should make everything perfectly clear and it is here that clarity is least likely to happen.

The main purpose of the model is to give a nontechnical person a set of instructions which will allow him to create his own simulation. However, there must be some restraints. The model does simulate the Foreign Service as it now exists, but it leaves the parameters open. For example, one does not really hire a junior officer at the lowest rank and then retire him the same year, but the option does exist in the model. Perhaps more practically, the model will allow the user to hire new recruits at all ranks, something that current congressional restrictions will not allow. The model assumes a normal retirement rate based on experience. The user may speculate on higher retirement rates based on new incentives, such as higher annuities for earlier retirement. While the model is structured on the current system, the user is offered enough options to combine over 36,000 different possible Foreign Service systems. It is doubtful that more than 100 would ever be used; however, the additional options cost nothing in clarity of its use and little in the construction, so the full 36,000 have been kept as a basic part of the model.

How can one offer such changes without the requirement of professional advisers? An example might be useful. Look at the following algebraic equation:

Help = (A) (Lovely Blonde) + (B) (Accepted Thesis)

A = 1 B = 0 ergo Help = Lovely Blonde.

The author is now the user. He looks realistically at his options and checks:

A = 0 B = 1

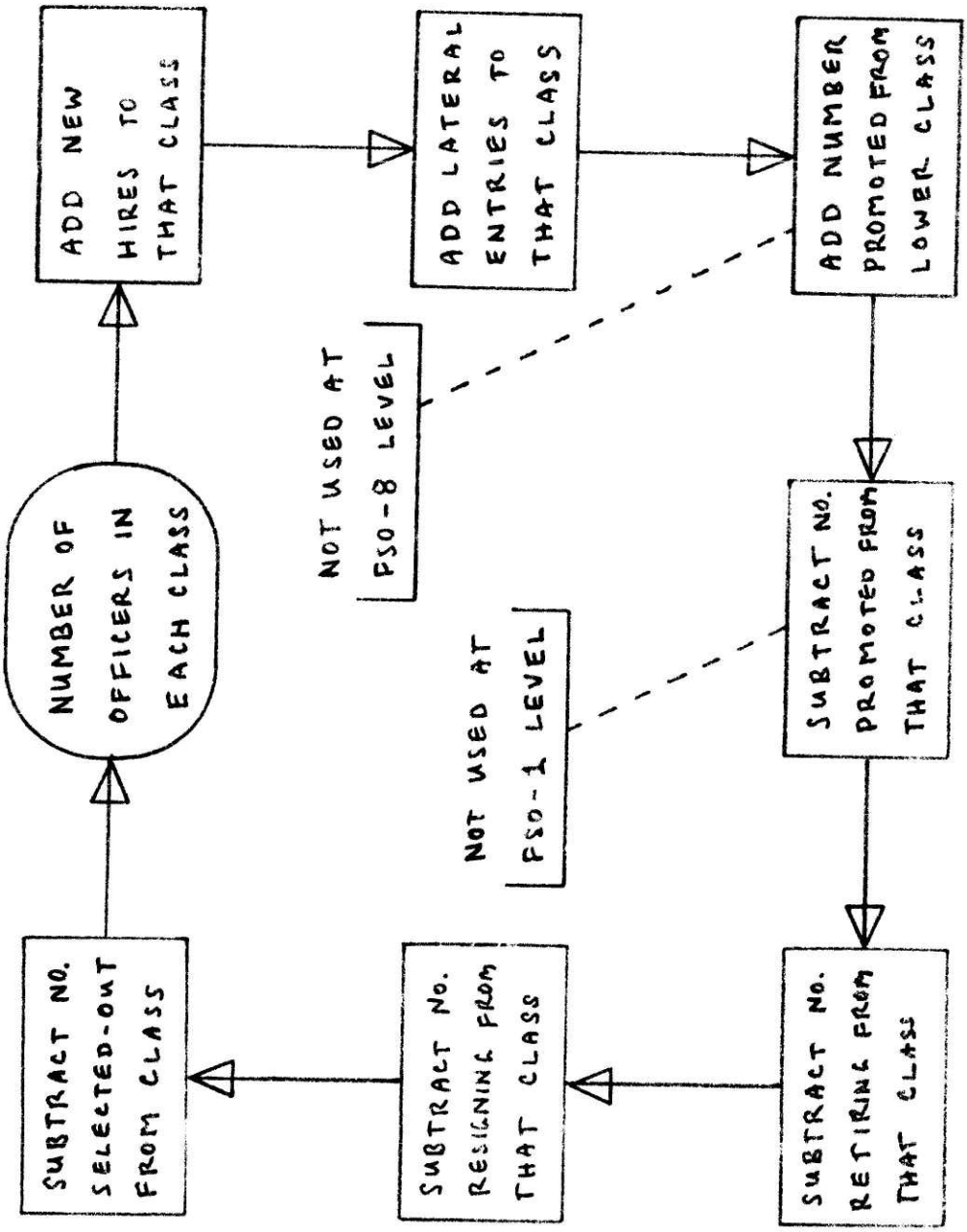
and has thus selected the game he would rather play. In the instructions, he merely places an "X" next to the policy of his choice and the keypunch operator worries about getting the zeros and ones in the proper place in the model.

Now refer to the model in Appendix I. The page references made will be the pages shown on the model itself and not the paging sequence for the entire thesis. On page 1, you will find the basic equations for each level and the equations for the rates. The DRN equations, short for drain, reduce the number of officers in each level. The items that reduce the number of FSO class 4 officers are found in the DRN4 equation. The definition for each item is found in the sector involving that action. For now, there will be a discussion of the FSO-4 level in detail, but it would be too lengthy to discuss the entire model. All of the variables are defined in the model itself.

R DRN4.KL = PROM4.K + RET4.K + R4.K + SO4.K

This states that the FSO-4 level will be drained (DRN) during the next period (KL) by the current number of FSO-4's promoted (PROM4.K), plus the number of FSO-4 officers retiring (RET4.K), plus the number of FSO-4 officers resigning (R4.K), and plus the number of FSO-4 officers who were

GENERAL OUTLINE
FLOW CHART

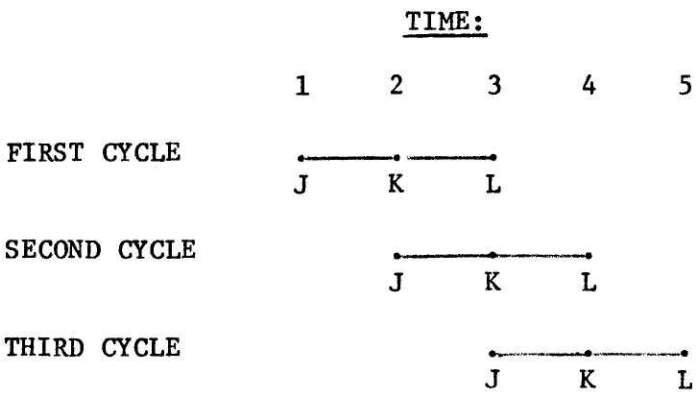


selected-out (SO4.K).

R FILL4.KL = PROM5.K + NH4.K + LE4.K

This states that the number of FSO-4 officers will be increased by the number of FSO-5 officers promoted (PROM5.K), plus the number of newly hired officers who entered at the FSO-4 rank (NH4.K), and plus the number of officers who became FSO-4's through lateral entry (LE4.K).

The level equation states that the level will be whatever it was before this transaction started plus the FILL equations results and minus the DRN equations results. There is an element of time which is indicated by the letters J, K, and L following a decimal mark. The letter K always indicates the action at the present moment. The letters J and L must be linked with the letter K to indicate the action which happened during the last time period (JK) or which will heppen during the next time period (KL). Thus, you begin with a level at time J and add to it and subtract from it the actions during the period JK bringing you to time K. Time K controls what the action will be during the time KL in the rate equations, giving the system its feedback, cyclical loop. Look at the General Outline, Flowchart for an explanation in pure English. For those familiar with DYNAMO and Systems Dynamics, there is also a DYNAMO flow chart. As every level has some informational feedback to every other level, it is not feasible to do a complete flow chart. It is doubtful that a complete chart would clarify much because it would be a solid page of dotted lines. Another view of the time period is:



With this brief introduction, you should be able to follow each of the sectors. The paper will not attempt to teach you DYNAMO, but will dwell on the options offered by the model.

Retirement Sector

Looking again at page 1, Appendix I, the retirement sector begins at the bottom of the page. You will note on page 2 that the basic model has chosen to play game RETX3. This is indicated by the equation RETX3 = 1, while the others equal zero. This means that the first two variables shown in the RET1.K (and all other levels) will equal zero and only the output from the third variable will be used.

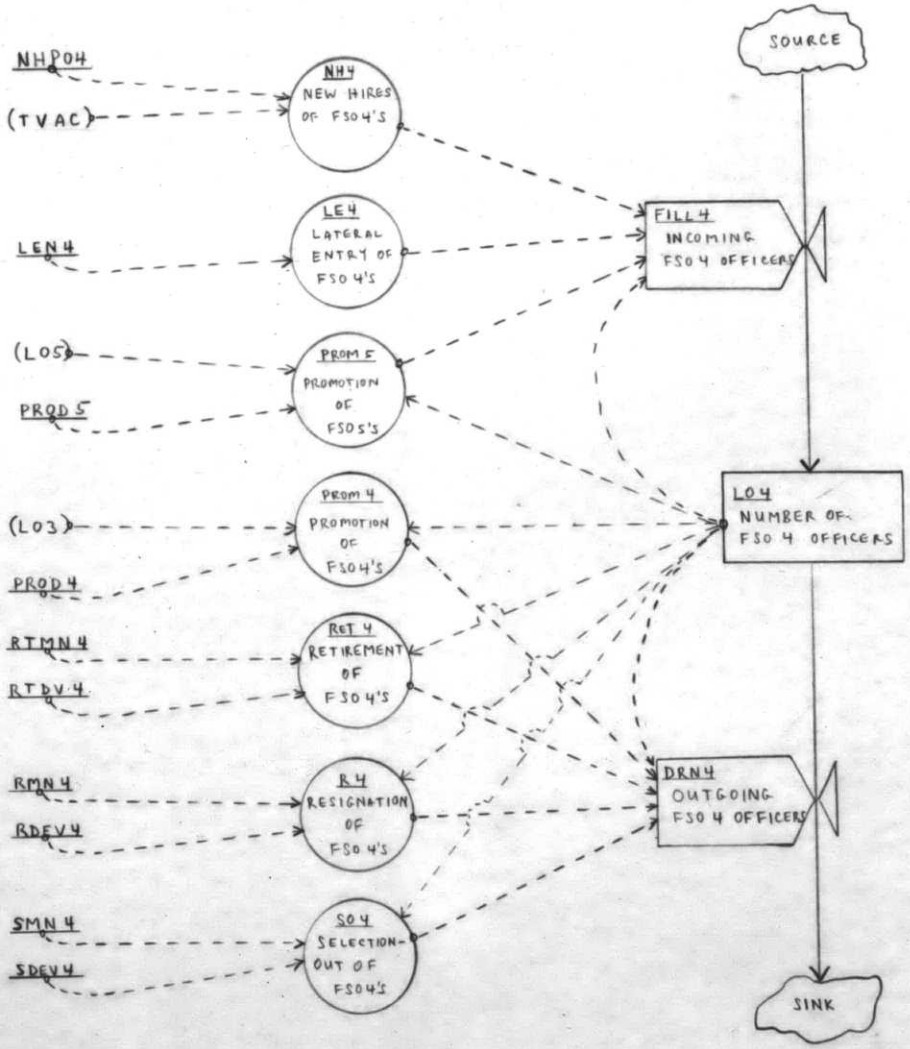
This is an interesting function of DYNAMO, which allows the user to choose a random estimate of the number retiring from each class which will be normally distributed around a mean and having a standard deviation chosen by the user. The equations RTMN and RTDV shown on page 2 are the mean and standard deviations for each rank being used by the model. They represent a percentage of officers in each class. The results are shown in the plot on page 24 indicated by the number of whichever rank you are look-

DYNAMO FLOWCHART

THIS FLOWCHART IS FOR THE FSO-4 LEVEL. OTHER LEVELS WILL BE THE SAME WHEN THE NUMBERS ARE CHANGED. THE FOLLOWING ARE THE ONLY EXCEPTIONS:

DRN 1 DOES NOT USE THE PROM 1 AUXILIARY
FILL 8 DOES NOT USE THE PROM 9 AUXILIARY

PLEASE NOTE THAT THE SO4 AUXILIARY IS NOT USED IN STRATEGY III OF THE EXAMPLE RUNS.



ing for. This same game was used in all three runs in this paper, so the figures are the same in the other runs.

Now you should refer to Appendix II. This is a tentative instruction set that would be given to the user. See if you understand how you would play a different game than the basis model uses.

The retirement sector offers just three choices. The user may state that an absolute number will retire from each class each year. This is not too practical because he does not have that kind of control over the number of officers who will retire. Besides, it is not responsive to the number of officers in any one class at each time period. Clearly, if he ordered thirty officers to retire from a class of twenty, he would be in trouble. The second option is responsive to the size of the class but is still an absolute percentage. While the random selection would seem the best choice, it is expected that many people will use the second option because they are not comfortable with statistics.

Resignation Sector

Because this sector has the same factor of random happening as the retiring sector, it offers the same options and is handled in the same manner.

Selection-Out Sector

Selection-out means firing, getting the axe, or whatever your culture calls for. The nice term is used because it does not include dismissal for

cause. The Foreign Service has a policy of "up or out." This means that each officer must be promoted within a certain amount of time or not fall in some bottom percentage of his class or he will be "selected-out." Whatever it is called, he leaves the service and therefore drains the ranks. There is some degree of control in this, especially of the bottom, so many per cents are raised or lowered; thus the model offers a way to choose the maximum of two results or the minimum of two results. The first three options are the same as those offered in the retirement sector. In addition, one may choose the absolute number or absolute percentage, whichever is greater (option labeled SOX5 on page 97) or smaller (option SOX4). They are offered to the user who wishes to insist on a certain minimum to be selected-out each period, even if it reflects a greater hardship on a class with fewer officers. He can use the other option to reverse the above and favor those who have a small number of officers in their level.

Promotion Sector

The Foreign Service has a large say about its promotion policies, so the user is offered ten policies to use. Many of them are merely the greater or lesser of two combinations as used in the selection-out sector. They become more useful here when one wishes to guarantee certain action no matter the other restraints that may influence the primary game he chooses to play. One very different option exists in this sector. It is noted as PX4 on page 100. SDL is an abbreviation for "seeking the desired level." One important goal of this model is to bring the skills and requirements into equilibrium. One could just promote willy-nilly and hope to reach

the point, but it might be more useful to observe the uncontrollable factors, such as resignation and retirement, change the unpopular factor of selection-out, and see how it will change the promotion rates. Selection-out is distasteful, but so is lack of promotion. While the number of each is not in inverse proportion to the other, it is true that having no selection-out will slow the promotion and/or new hire rates. The model has chosen this option for just such a test. This means that the promotion rates will be the fastest possible to achieve the desired levels in each rank within the limits set by the other sectors of the model.

There is one option discussed in the model which is not complete. This is basing promotions as a share of the budget allowance for those promotions. This will be resolved by a table function. The table function is now shown in the model, but the figures have no link to reality. The table is in the model merely as a demonstration on how it could be done. The final solution would have to be worked out carefully with budget experts supplying the figures.

New Hire Sector

There are two ways to enter the Foreign Service as a career officer. One is to pass the examinations and enter the Foreign Service at the bottom of two ranks. Because of difficulties with starting salaries, the Department of State is considering requesting a change in legislation to permit hiring at the FSO-6 level. Another way is to enter in the higher ranks through lateral entry.

There are two options which are a bit different here. NHX3 (page 103)

should be used when one wishes a steady state Foreign Service, neither gaining nor losing numbers. NHX9 is to be used when the user wishes the Foreign Service to grow or shrink by a certain percentage each year. This is useful when he wishes to experiment with reduction in force through attrition.

Lateral Entry Sector

The types of variables used in this sector have been explained above.

Comments

Throughout the model, you have seen variable defined as (used to facilitate computation). This means precisely that. They are merely variables used in intermediate steps to avoid extremely long equations. They do not alter the basic structure of the equations.

CHAPTER IV

A TEST: SELECTION-OUT

> Of the distasteful and negative duties which are assigned to the Director of Personnel, the Director General and the Deputy Under Secretary for Management, the operation of the selection-out system is certainly the most unpleasant. Unless the benefits to the Service outweigh its negative impact on the individuals directly affected, those administering the policy would argue for its abandonment.[1]

Selection-out has been with the Foreign Service since the Foreign Service Act of 1946. The purpose of selection-out is to produce a competitive service in which only the best officers are able to rise to the top of their profession. It has become one of the most important issues in the personnel system of the Department of State. Only the Foreign Service Officers face the threat. It is difficult to say whether it is a good policy or a millstone the FSO's must bear.

The proponents argue that it improves the Service by eliminating the least effective officers, furnishes more rapid promotion for the best officers and a more rapid turnover in the Service, creates a more competitive Service approximating industry where competitive conditions exist, and discourages the entrance of applicants who seek security over responsibility. The opponents answer that the intense competition destroys mutual confidence and morale, that the inhumane effects of selection-out on the employee and his family in terms of the hazards to mental and physical health, economic security, self-confidence, and internal strains on mar-

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[1]William O. Hall, Director General of the Foreign Service, "Selection-Out Policies in the Foreign Service," The Department of State Newsletter, June 1972, Inside cover.

riages are not acceptable in modern society; that since recruitment is now highly selective, selection-out is no longer needed as it was in the past because of the mixed quality of officers produced under the old system; that job insecurity produces insecure and less competent employees, inhibits creativity and produces fear of challenging accepted patterns; and, finally, that because the system is administered poorly and unfairly, its purpose can be better served by creating more rapid turnover for officers in their later years and rewarding those officers with earlier retirement. They also argue that selection-out produces elitism.

Whatever the case, the Director General makes the point that it would be abandoned if the benefits do not outweigh the disadvantages. It would seem that this would call for the model and this is what has been done.

The basic model tests the policy of only selecting-out officers in the FSO-6 and FSO-3 ranks. Most of the FSO-6's facing selection-out would be young enough to obtain other employment. The FSO-3's would not be truly selected-out but forced into retirement. The difference may be lost on the man, but at least he would be receiving a retirement check and would not be under so much pressure to find a job in his early fifties. All of the data required to make this policy run in the model are in the basic equations shown in Appendix I. Furthermore, it is in the information furnished under "is now" in the instructions to the user in Appendix II.

The second policy tested was an arbitrary dismissal of the bottom 5 per cent of each class each year. This is a very strict form of selection-out. All that was necessary to do this was to make SOX3 = 0 and SOX2 = 1. If you will look at page 99 within Appendix II, you will see that this

changes the policy from the use of the SMN and SDEV variables, which only affect FSO-3's and FSO-6's, by an estimated percentage chosen along a normal distribution to the use of the variable SOPC using the bottom 5 per cent of every rank. This required just two cards to make the change plus the run card with the title "bottom five percent selected out." This title will appear at the top of every page of print-out.

The same process was used in the third game, which is titled "no selection-out." In this case, all of the selection-out options are set to zero. The results are interesting (see the Selection-Out Table).

Policies one and two produce about the same number of officers selected-out each year, but the numbers are spread over different ranks. If we consider that the dismissal of FSO-3's and above is humane because they can receive immediate retirement, and that FSO-6's and below are young enough to find other jobs, we would consider only the selection-out of FSO-4's and FSO-5's as "bad." In this case, policy one must be accepted as better than policy two. If our goal is only to reduce the number of officers selected-out each year, then the third policy is best.

Our purpose is to achieve an effective Foreign Service while being as generous to the employees as possible. One important part of a good career system is to reward good deeds with promotion. In promotion, policies one and two are again similar, promoting just over 20 per cent a year. Policy three seems to have paid the price of keeping on the employees that the other policies would have selected-out. Promotion is held to 5 per cent.

A rough estimate of the time that an average officer would spend in

SELECTION-OUT TABLE

RESULTS

(Average of results
of first five years)

STRATEGIES

Class	I	II	III
	Number promoted from class (% of class)		
2	11 (3)	35 (8)	14 (3)
3	19 (3)	61 (8)	14 (3)
4	181 (21)	107 (12)	24 (3)
5	189 (26)	159 (22)	38 (5)
6	196 (35)	203 (42)	45 (9)
7	312 (100)	255 (81)	74 (23)
8	15 (77)	19 (100)	6 (55)
Total	923 (23.3)	839 (21.2)	215 (5.4)
	Number selected-out (% from class)		
1	0	20	0
2	0	22	0
3	151	37	0
4	0	44	0
5	0	36	0
6	99	24	0
7	0	16	0

SELECTION-OUT TABLE (CONT.)

8	0	1	0
Total	250 (5)	200 (6.3)	0
% eligible for retirement	0 %	0 %	N.A.
% middle aged	0 %	40 %	N.A.
% under 30	40 %	20 %	N.A.

each class can be obtained by dividing 100 by the percentage of that class promoted. This means that the average officer would reach the FSO-5 rank in 5.19, 4.15, or 17.2 years per policy one, two, or three respectively. The Junior Foreign Service Officer Association (JFSOC) made a study in 1966 which revealed that the equivalent rank to FSO-5 is usually achievable in five years in other government agencies. Their findings were verified by the U.S. Civil Service Commission. JFSOC's study was made because of the great discontent with the rate of promotion among junior officers at that time. Then it was taking about 8.5 years to reach the FSO-5 rank.

The only officers facing severe selection-out are the FSO-6's. It appears that the JFSOC incident indicates that these officers would rather face the selection-out than accept a promotion rate less than one-third of other government agencies. Therefore, one would oppose the use of policy three.

Policy two has a slightly better promotion rate than that of policy one. However, this is bought at a cost of placing 40 per cent of those selected-out in the middle aged, difficult-to-adjust category. Policy one guarantees them a career to age fifty and retirement with immediate annuity. For this reason, the first policy seems the best.

Is the model justified? It would be hard to say at this point. Certainly the instructions should be better laid out and tested with nontechnical users. The statistics used in all of the sectors need a close check by a competent statistician. Who is to say that the model works in even 100 combinations, let alone the entire 36,000 plus? Time and funds would not allow such testing. The academic exercise must come to an end and the model thrown to "Foggy Bottom" for the final judgment. The author is pleased to announce that this is not merely an academic exercise for him, for he will spend the next two years working and improving this model as his full time endeavor at the Department of State. He will also have the privilege of carrying through with a model begun by Ed Parsons who started the entire exercise in 1970.

The need for a model has been demonstrated. This exercise shows that it is useful in a very crucial and sensitive area. Let us hope that it will receive acceptance by our political colleagues.

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NOTE
NOTE
NOTE                    GAMING MODEL - THE US FOREIGN SERVICE
NOTE                    MODELED BY CHUCK EMMONS, MARCH 1972
NOTE
NOTE
NOTE
NOTE  THE FOLLOWING GIVES  THE RATES IN AND OUT OF EACH FSO CLASS AS
NOTE  WELL AS THE LEVEL OF THAT CLASS
NOTE
R       DRN1.KL=RET1.K+R1.K+SO1.K
L       LO1.K=LO1.J+(DT)(FILL1.JK-DRN1.JK)
R       FILL1.KL=PROM2.K+NH1.K+LE1.K
NOTE
R       DRN2.KL=PROM2.K+RET2.K+R2.K+SO2.K
L       LO2.K=LO2.J+(DT)(FILL2.JK-DRN2.JK)
R       FILL2.KL=PROM3.K+NH2.K+LE2.K
NOTE
R       DRN3.KL=PROM3.K+RET3.K+R3.K+SO3.K
L       LO3.K=LO3.J+(DT)(FILL3.JK-DRN3.JK)
R       FILL3.KL=PROM4.K+NH3.K+LE3.K
NOTE
R       DRN4.KL=PROM4.K+RET4.K+R4.K+SO4.K
L       LO4.K=LO4.J+(DT)(FILL4.JK-DRN4.JK)
R       FILL4.KL=PROM5.K+NH4.K+LE4.K
NOTE
R       DRN5.KL=PROM5.K+RET5.K+R5.K+SO5.K
L       LO5.K=LO5.J+(DT)(FILL5.JK-DRN5.JK)
R       FILL5.KL=PROM6.K+NH5.K+LE5.K
NOTE
L       LO6.K=LO6.J+(DT)(FILL6.JK-DRN6.JK)
R       DRN6.KL=PROM6.K+RET6.K+R6.K+SO6.K
R       FILL6.KL=PROM7.K+NH6.K+LE6.K
NOTE
R       DRN7.KL=PROM7.K+RET7.K+R7.K+SO7.K
L       LO7.K=LO7.J+(DT)(FILL7.JK-DRN7.JK)
R       FILL7.KL=PROM8.K+NH7.K+LE7.K
NOTE
R       DRN8.KL=PROM8.K+RET8.K+R8.K+SO8.K
L       LO8.K=LO8.J+(DT)(FILL8.JK-DRN8.JK)
R       FILL8.KL=NH8.K+LE8.K
NOTE
NOTE      DRN() = NUMBER LEAVING FSO() LEVEL
NOTE      FILL()= NUMBER ENTERING FSO() LEVEL
NOTE      LO()  = NUMBER IN FSO() LEVEL
NOTE      RET() = NUMBER RETIRING FROM FSO() LEVEL
NOTE      R()   = NUMBER RESIGNING FROM FSO() LEVEL
NOTE      SO()  = NUMBER SELECTED OUT FROM FSO() LEVEL
NOTE      P()   = NUMBER PROMOTED OUT OF FSO() LEVEL
NOTE      NH()  = NUMBER OF NEWLY HIRED INTO FSO() LEVEL
NOTE      LE()  = NUMBER OF LATERAL ENTRIES INTO FSO() LEVEL
NOTE
NOTE
NOTE   BASIC INPUT TO THE RETIREMENT SECTOR (VARIOUS POLICIES)
NOTE
A     RET1.K=(RETX1)(RT1)+(RETX2)(NRPC1.K)+(RETX3)(NORMRN(RTMN1,RTDV1))(
X     LO1.K)
A     RET2.K=(RETX1)(RT2)+(RETX2)(NRPC2.K)+(RETX3)(NORMRN(RTMN2,RTDV2))(
```

```
X     LO2,K)
A     RET3,K=(RETX1)(RT3)+(RETX2)(NRPC3,K)+(RETX3)(NORMRN(RTMN3,RTDV3))(
X     LO3,K)
A     RET4,K=(RETX1)(RT4)+(RETX2)(NRPC4,K)+(RETX3)(NORMRN(RTMN4,RTDV4))(
X     LO4,K)
A     RET5,K=(RETX1)(RT5)+(RETX2)(NRPC5,K)+(RETX3)(NORMRN(RTMN5,RTDV5))(
X     LO5,K)
A     RET6,K=(RETX1)(RT6)+(RETX2)(NRPC6,K)+(RETX3)(NORMRN(RTMN6,RTDV6))(
X     LO6,K)
A     RET7,K=(RETX1)(RT7)+(RETX2)(NRPC7,K)+(RETX3)(NORMRN(RTMN7,RTDV7))(
X     LO7,K)
A     RET8,K=(RETX1)(RT8)+(RETX2)(NRPC8,K)+(RETX3)(NORMRN(RTMN8,RTDV8))(
X     LO8,K)
NOTE
NOTE     RT()  = NUMBER PER CLASS()
NOTE     RTPC()= PERCENT PER CLASS()
NOTE     RTMN()= MEAN OF PERCENT PER CLASS (USING NORMAL DISTRIBUTION
NOTE     RTDV()= STANDARD DEVIATION        MULTIPLIED BY RANDOM NUMBER
NOTE                                       GENERATOR OUTPUT)
NOTE     NRPC()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE
NOTE     RETX1 = EQUAL ONE WHEN WISH RT ONLY
NOTE     RETX2 = EQUAL ONE WHEN WISH RTPC ONLY
NOTE     RETX3 = EQUAL ONE WHEN WISH RANDOM ESTIMATE  ONLY
C     RETX1=0
C     RETX2=0
C     RETX3=1
NOTE
C     RT1=100
C     RT2=80
C     RT3=100
C     RT4=0
C     RT5=0
C     RT6=0
C     RT7=0
C     RT8=0
NOTE
C     RTPC1=0.04
C     RTPC2=0.02
C     RTPC3=0.02
C     RTPC4=0
C     RTPC5=0
C     RTPC6=0
C     RTPC7=0
C     RTPC8=0
NOTE
C     RTMN1=0.04
C     RTMN2=0.02
C     RTMN3=0.02
C     RTMN4=0
C     RTMN5=0
C     RTMN6=0
C     RTMN7=0
C     RTMN8=0
NOTE
C     RTDV1=0.003
C     RTDV2=0.002
C     RTDV3=0.002
```

```
C     RTDV4=0
C     RTDV5=0
C     RTDV6=0
C     RTDV7=0
C     RTDV8=0
NOTE
A     NRPC1.K=(RTPC1)(LO1.K)
A     NRPC2.K=(RTPC2)(LO2.K)
A     NRPC3.K=(RTPC3)(LO3.K)
A     NRPC4.K=(RTPC4)(LO4.K)
A     NRPC5.K=(RTPC5)(LO5.K)
A     NRPC6.K=(RTPC6)(LO6.K)
A     NRPC7.K=(RTPC7)(LO7.K)
A     NRPC8.K=(RTPC8)(LO8.K)
NOTE
NOTE
NOTE  BASIC INPUT TO THE RESIGNATION SECTOR
NOTE
NOTE     RN()  = NUMBER PER CLASS
NOTE     RPC() = PERCENT PER CLASS
NOTE     RMN() = MEAN OF PERCENT PER CLASS
NOTE     RDEV()= STANDARD DEVIATION
NOTE
NOTE     RX1   = EQUAL ONE WHEN WISH RN ONLY
NOTE     RX2   = EQUAL ONE WHEN WISH RPC ONLY
NOTE     RX3   = EQUAL ONE WHEN WISH ESTIMATED PERCENT ONLY
C     RX1=0
C     RX2=0
C     RX3=1
NOTE
A     R1.K=(RX1)(RN1)+(RX2)(RPC1)(LO1.K)+(RX3)(LO1.K)(NORMRN(RMN1,RDEV1)
X     )
A     R2.K=(RX1)(RN2)+(RX2)(RPC2)(LO2.K)+(RX3)(LO2.K)(NORMRN(RMN2,RDEV2)
X     )
A     R3.K=(RX1)(RN3)+(RX2)(RPC3)(LO3.K)+(RX3)(LO3.K)(NORMRN(RMN3,RDEV3)
X     )
A     R4.K=(RX1)(RN4)+(RX2)(RPC4)(LO4.K)+(RX3)(LO4.K)(NORMRN(RMN4,RDEV4)
X     )
A     R5.K=(RX1)(RN5)+(RX2)(RPC5)(LO5.K)+(RX3)(LO5.K)(NORMRN(RMN5,RDEV5)
X     )
A     R6.K=(RX1)(RN6)+(RX2)(RPC6)(LO6.K)+(RX3)(LO6.K)(NORMRN(RMN6,RDEV6)
X     )
A     R7.K=(RX1)(RN7)+(RX2)(RPC7)(LO7.K)+(RX3)(LO7.K)(NORMRN(RMN7,RDEV7)
X     )
A     R8.K=(RX1)(RN8)+(RX2)(RPC8)(LO8.K)+(RX3)(LO8.K)(NORMRN(RMN8,RDEV8)
X     )
NOTE
C     RN1=0
C     RN2=0
C     RN3=5
C     RN4=0
C     RN5=25
C     RN6=25
C     RN7=10
C     RN8=5
NOTE
C     RPC1=0
C     RPC2=0
```

```
C     RPC3=0
C     RPC4=0.01
C     RPC5=0.01
C     RPC6=0.06
C     RPC7=0.04
C     RPC8=0.27
NOTE
C     RMN1=0
C     RMN2=0
C     RMN3=0
C     RMN4=0.01
C     RMN5=0.01
C     RMN6=0.06
C     RMN7=0.04
C     RMN8=0.27
NOTE
C     RDEV1=0
C     RDEV2=0
C     RDEV3=0
C     RDEV4=0.001
C     RDEV5=0.001
C     RDEV6=0.005
C     RDEV7=0.0025
C     RDEV8=0.015
NOTE
NOTE
NOTE
NOTE  BASIC INPUT TO THE SELECTION OUT SECTOR
NOTE
NOTE     SOP() = NUMBER PER CLASS
NOTE     SOPC()= PERCENT PER CLASS
NOTE     SMN() = MEAN OF PERCENT PER CLASS
NOTE     SDEV ()= STANDARD DEVIATION
NOTE    NSPC()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE
NOTE     SOX1  = EQUAL ONE WHEN WISH SOP ONLY
NOTE     SOX2  = EQUAL ONE WHEN WISH SOPC ONLY
NOTE     SOX3  = EQUAL ONE WHEN WISH ESTIMATED PERCENT ONLY
NOTE     SOX4  = EQUAL ONE WHEN WISH LESSER OF SOP AND SOPC
NOTE     SOX5  = EQUAL ONE WHEN WISH GREATER OF SOP AND SOPC
C     SOX1=0
C     SOX2=0
C     SOX3=1
C     SOX4=0
C     SOX5=0
NOTE
A     SO1.K=(SOX1)(SOP1)+(SOX2)(SOPC1)(LO1.K)+(SOX3)(LO1.K)(NORMRN(SMN1,
X     SDEV1))+(SOX4)(MIN(SOP1,NSPC1.K))+(SOX5)(MAX(SOP1,NSPC1.K))
A     SO2.K=(SOX1)(SOP2)+(SOX2)(SOPC2)(LO2.K)+(SOX3)(LO2.K)(NORMRN(SMN2,
X     SDEV2))+(SOX4)(MIN(SOP2,NSPC2.K))+(SOX5)(MAX(SOP2,NSPC2.K))
A     SO3.K=(SOX1)(SOP3)+(SOX2)(SOPC3)(LO3.K)+(SOX3)(LO3.K)(NORMRN(SMN3,
X     SDEV3))+(SOX4)(MIN(SOP3,NSPC3.K))+(SOX5)(MAX(SOP3,NSPC3.K))
A     SO4.K=(SOX1)(SOP4)+(SOX2)(SOPC4)(LO4.K)+(SOX3)(LO4.K)(NORMRN(SMN4,
X     SDEV4))+(SOX4)(MIN(SOP4,NSPC4.K))+(SOX5)(MAX(SOP4,NSPC4.K))
A     SO5.K=(SOX1)(SOP5)+(SOX2)(SOPC5)(LO5.K)+(SOX3)(LO5.K)(NORMRN(SMN5,
X     SDEV5))+(SOX4)(MIN(SOP5,NSPC5.K))+(SOX5)(MAX(SOP5,NSPC5.K))
A     SO6.K=(SOX1)(SOP6)+(SOX2)(SOPC6)(LO6.K)+(SOX3)(LO6.K)(NORMRN(SMN6,
X     SDEV6))+(SOX4)(MIN(SOP6,NSPC6.K))+(SOX5)(MAX(SOP6,NSPC6.K))
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A     SO7.K=(SOX1)(SOP7)+(SOX2)(SOPC7)(LO7.K)+(SOX3)(LO7.K)(NORMRN(SMN7,
X     SDEV7))+(SOX4)(MIN(SOP7,NSPC7.K))+(SOX5)(MAX(SOP7,NSPC7.K))
A     SO8.K=(SOX1)(SOP8)+(SOX2)(SOPC8)(LO8.K)+(SOX3)(LO8.K)(NORMRN(SMN8,
X     SDEV8))+(SOX4)(MIN(SOP8,NSPC8.K))+(SOX5)(MAX(SOP8,NSPC8.K))
NOTE
A     NSPC1.K=(SOPC1)(LO1.K)
A     NSPC2.K=(SOPC2)(LO2.K)
A     NSPC3.K=(SOPC3)(LO3.K)
A     NSPC4.K=(SOPC4)(LO4.K)
A     NSPC5.K=(SOPC5)(LO5.K)
A     NSPC6.K=(SOPC6)(LO6.K)
A     NSPC7.K=(SOPC7)(LO7.K)
A     NSPC8.K=(SOPC8)(LO8.K)
NOTE
C     SOP1=0
C     SOP2=0
C     SOP3=0
C     SOP4=20
C     SOP5=0
C     SOP6=40
C     SOP7=0
C     SOP8=0
NOTE
C     SOPC1=0.05
C     SOPC2=0.05
C     SOPC3=0.05
C     SOPC4=0.05
C     SOPC5=0.05
C     SOPC6=0.05
C     SOPC7=0.05
C     SOPC8=0.05
NOTE
C     SMN1=0
C     SMN2=0
C     SMN3=0.2
C     SMN4=0
C     SMN5=0
C     SMN6=0.2
C     SMN7=0
C     SMN8=0
NOTE
C     SDEV1=0
C     SDEV2=0
C     SDEV3=0.025
C     SDEV4=0
C     SDEV5=0
C     SDEV6=0.025
C     SDEV7=0
C     SDEV8=0
NOTE
NOTE
NOTE  BASIC INPUT TO THE PROMCTION SECTOR
NOTE
NOTE     PN()  = NUMBER PER CLASS
NOTE     PPC() = PERCENT PER CLASS
NOTE     PPCB()= PERCENT PER CLASS OF BUDGET AVAILABLE
NOTE     PSOL    ANOTHER OPTION EXISTS CALLED SEEKING DESIRED LEVEL.
NOTE             THIS IS NOT A VARIABLE SHOWN IN MODEL BUT IS BASIC
```

```
NOTE              TO DYNAMIC SYSTEMS AND IS DONE AUTOMATICALLY BY DYNAMO
NOTE      PROD()= PROMOTION DELAY FACTOR
NOTE      SHBG()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE      BLIM()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE      TBUG()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE      PRO()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE      NPPC()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE
NOTE      PX1   = EQUAL ONE WHEN WISH PN ONLY
NOTE      PX2   = EQUAL ONE WHEN WISH PPC ONLY
NOTE      PX3   = EQUAL ONE WHEN WISH PPCB ONLY
NOTE      PX4   = EQUAL ONE WHEN WISH SDL ONLY
NOTE      PX5   = EQUAL ONE WHEN WISH LESSER OF PN AND PPCB
NOTE      PX6   = EQUAL ONE WHEN WISH LESSER OF PPC AND PPCB
NOTE      PX7   = EQUAL ONE WHEN WISH LESSER OF PN AND SDL
NOTE      PX9   = EQUAL ONE WHEN WISH GREATER OF PN AND SDL
NOTE      PX10  = EQUAL ONE WHEN WISH GREATER OF PPC AND SDL
C     PX1=0
C     PX2=0
C     PX3=0
C     PX4=1
C     PX5=0
C     PX6=0
C     PX7=0
C     PX8=0
C     PX9=0
C     PX10=0
NOTE
C     PROM1=0
A     P2.K=(PX1)(PN2)+(PX2)(PPC2)(LO2.K)+(PX3)(BLIM2.K)+(PX4)(PRO2.K)+(P
X     X5)(MIN(PN2,BLIM2.K))+(PX6)(MIN(NPPC2.K,BLIM2.K))+(PX7)(MIN(PN2,PR
X     O2.K))+(PX8)(MIN(NPPC2.K,PRO2.K))+(PX9)(MAX(PN2,PRO2.K))+(PX10)(MA
X     X(NPPC2.K,PRO2.K))
A     PROM2.K=(MIN((MAX(P2.K,NUL)),LO2.K))(1/PROD2)
A     P3.K=(PX1)(PN3)+(PX2)(PPC3)(LO3.K)+(PX3)(BLIM3.K)+(PX4)(PRO3.K)+(P
X     X5)(MIN(PN3,BLIM3.K))+(PX6)(MIN(NPPC3.K,BLIM3.K))+(PX7)(MIN(PN3,PR
X     O3.K))+(PX8)(MIN(NPPC3.K,PRO3.K))+(PX9)(MAX(PN3,PRO3.K))+(PX10)(MA
X     X(NPPC3.K,PRO3.K))
A     PROM3.K=(MIN((MAX(P3.K,NUL)),LO3.K))(1/PROD3)
A     P4.K=(PX1)(PN4)+(PX2)(PPC4)(LO4.K)+(PX3)(BLIM4.K)+(PX4)(PRO4.K)+(P
X     X5)(MIN(PN4,BLIM4.K))+(PX6)(MIN(NPPC4.K,BLIM4.K))+(PX7)(MIN(PN4,PR
X     O4.K))+(PX8)(MIN(NPPC4.K,PRO4.K))+(PX9)(MAX(PN4,PRO4.K))+(PX10)(MA
X     X(NPPC4.K,PRO4.K))
A     PROM4.K=(MIN((MAX(P4.K,NUL)),LO4.K))(1/PROD4)
A     P5.K=(PX1)(PN5)+(PX2)(PPC5)(LO5.K)+(PX3)(BLIM5.K)+(PX4)(PRO5.K)+(P
X     X5)(MIN(PN5,BLIM5.K))+(PX6)(MIN(NPPC5.K,BLIM5.K))+(PX7)(MIN(PN5,PR
X     O5.K))+(PX8)(MIN(NPPC5.K,PRO5.K))+(PX9)(MAX(PN5,PRO5.K))+(PX10)(MA
X     X(NPPC5.K,PRO5.K))
A     PROM5.K=(MIN((MAX(P5.K,NUL)),LO5.K))(1/PROD5)
A     P6.K=(PX1)(PN6)+(PX2)(PPC6)(LO6.K)+(PX3)(BLIM6.K)+(PX4)(PRO6.K)+(P
X     X5)(MIN(PN6,BLIM6.K))+(PX6)(MIN(NPPC6.K,BLIM6.K))+(PX7)(MIN(PN6,PR
X     O6.K))+(PX8)(MIN(NPPC6.K,PRO6.K))+(PX9)(MAX(PN6,PRO6.K))+(PX10)(MA
X     X(NPPC6.K,PRO6.K))
A     PROM6.K=(MIN((MAX(P6.K,NUL)),LO6.K))(1/PROD6)
A     P7.K=(PX1)(PN7)+(PX2)(PPC7)(LO7.K)+(PX3)(BLIM7.K)+(PX4)(PRO7.K)+(P
X     X5)(MIN(PN7,BLIM7.K))+(PX6)(MIN(NPPC7.K,BLIM7.K))+(PX7)(MIN(PN7,PR
X     O7.K))+(PX8)(MIN(NPPC7.K,PRO7.K))+(PX9)(MAX(PN7,PRO7.K))+(PX10)(MA
X     X(NPPC7.K,PRO7.K))
```

```
A       PROM7.K=(MIN((MAX(P7.K,NUL)),LO7.K))(1/PROD7)
A       P8.K=(PX1)(PN8)+(PX2)(PPC8)(LO8.K)+(PX3)(BLIM8.K)+(PX4)(PRO8.K)+(P
X       X5)(MIN(PN8,BLIM8.K))+(PX6)(MIN(NPPC8.K,BLIM8.K))+(PX7)(MIN(PN8,PR
X       O8.K))+(PX8)(MIN(NPPC8.K,PRO8.K))+(PX9)(MAX(PN8,PRO8.K))+(PX10)(MA
X       X(NPPC8.K,PRO8.K))
A       PROM8.K=(MIN((MAX(P8.K,NUL)),LO8.K))(1/PROD8)
NOTE
C       PROD2=1
C       PROD3=1
C       PROD4=1
C       PROD5=1
C       PROD6=1
C       PROD7=1
C       PROD8=1
NOTE
A       SHBG2.K=(PPCB2)(BUDGT)
A       SHBG3.K=(PPCB3)(BUDGT)
A       SHBG4.K=(PPCB4)(BUDGT)
A       SHBG5.K=(PPCB5)(BUDGT)
A       SHBG6.K=(PPCB6)(BUDGT)
A       SHBG7.K=(PPCB7)(BUDGT)
A       SHBG8.K=(PPCB8)(BUDGT)
NOTE
A       BLIM2.K=TABLE(TBUG2,SHBG2.K,0,1000000,500000)
T       TBUG2=0/15/30
A       BLIM3.K=TABLE(TBUG3,SHBG3.K,0,1000000,500000)
T       TBUG3=0/15/30
A       BLIM4.K=TABLE(TBUG4,SHBG4.K,0,1000000,500000)
T       TBUG4=0/15/30
A       BLIM5.K=TABLE(TBUG5,SHBG5.K,0,1000000,500000)
T       TBUG5=0/15/30
A       BLIM6.K=TABLE(TBUG6,SHBG6.K,0,1000000,500000)
T       TBUG6=0/15/30
A       BLIM7.K=TABLE(TBUG7,SHBG7.K,0,1000000,500000)
T       TBUG7=0/15/30
A       BLIM8.K=TABLE(TBUG8,SHBG8.K,0,1000000,500000)
T       TBUG8=0/15/30
NOTE
A       PRO2.K=MIN(MAX(TOUT1.K,NUL),LO2.K)
A       PRO3.K=MIN(MAX(TOUT2.K,NUL),LO3.K)
A       PRO4.K=MIN(MAX(TOUT3.K,NUL),LO4.K)
A       PRO5.K=MIN(MAX(TOUT4.K,NUL),LO5.K)
A       PRO6.K=MIN(MAX(TOUT5.K,NUL),LO6.K)
A       PRO7.K=MIN(MAX(TOUT6.K,NUL),LO7.K)
A       PRO8.K=MIN(MAX(TOUT7.K,NUL),LO8.K)
NOTE
A       TOUT1.K=(DL1-LO1.K)-NH1.K-LE1.K+RET1.K+R1.K+SO1.K
A       TOUT2.K=(DL2-LO2.K)-NH2.K-LE2.K+RET2.K+R2.K+SO2.K+PROM2.K
A       TOUT3.K=(DL3-LO3.K)-NH3.K-LE3.K+RET3.K+R3.K+SO3.K+PROM3.K
A       TOUT4.K=(DL4-LO4.K)-NH4.K-LE4.K+RET4.K+R4.K+SO4.K+PROM4.K
A       TOUT5.K=(DL5-LO5.K)-NH5.K-LE5.K+RET5.K+R5.K+SO5.K+PROM5.K
A       TOUT6.K=(DL6-LO6.K)-NH6.K-LE6.K+RET6.K+R6.K+SO6.K+PROM6.K
A       TOUT7.K=(DL7-LO7.K)-NH7.K-LE7.K+RET7.K+R7.K+SO7.K+PROM7.K
NOTE
A       NPPC2.K=(PPC2)(LO2.K)
A       NPPC3.K=(PPC3)(LO3.K)
A       NPPC4.K=(PPC4)(LO4.K)
A       NPPC5.K=(PPC5)(LO5.K)
```

```
A     NPPC6.K=(PPC6)(LO6.K)
A     NPPC7.K=(PPC7)(LO7.K)
A     NPPC8.K=(PPC8)(LO8.K)
NOTE
C     PN2=5
C     PN3=20
C     PN4=40
C     PN5=60
C     PN6=60
C     PN7=40
C     PN8=10
NOTE
C     PPC2=0.1
C     PPC3=0.1
C     PPC4=0.1
C     PPC5=0.1
C     PPC6=0.1
C     PPC7=0.1
C     PPC8=0.1
NOTE
C     PPCB2=0.1
C     PPCB3=0.1
C     PPCB4=0.1
C     PPCB5=0.1
C     PPCB6=0.1
C     PPCB7=0.1
C     PPCB8=0.1
NOTE
NOTE
NOTE  BASIC INPUT TO THE NEW HIRE SECTOR
NOTE
NOTE     NHN() = NUMBER OF NEW HIRES
NOTE     NHPC()= PERCENT PER CLASS
NOTE     NHPO()= PERCENT OF NEW HIRES
NOTE     NHZ   = PERCENT OF TOTAL VACANCIES (ALL FSO'S) YOU WOULD LIKE
NOTE             REPLACE BY NEW HIRES FROM OUTSIDE SOURCES OTHER THA LE
NOTE     TNH=  TOTAL OF NEW HIRES ACCORDING TO GAMES NHX9,10 AND 11
NOTE     POUT()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE     QNH   = VARIABLE USED TO FACILITATE COMPUTATION
NOTE
NOTE     NHX1  = EQUAL ONE WHEN WISH NHN ONLY
NOTE     NHX2  = EQUAL ONE WHEN WISH NHPC ONLY
NOTE     NHX3  = EQUAL ONE WHEN WISH TO REPLACE THOSE LEAVING SERVICE
NOTE             ONLY AND ASSIGNED TO CLASS BY NHPO PERCENT
NOTE     NHX4  = EQUAL ONE WHEN WISH LESSER OF NHN AND NHPC
NOTE     NHX5  = EQUAL ONE WHEN WISH LESSER OF NHPC AND NHPO
NOTE     NHX6  = EQUAL ONE WHEN WISH GREATER OF NHN AND NHPO
NOTE     NHX7  = EQUAL ONE WHEN WISH GREATER OF NHPC AND NHPO
NOTE     NHX8  = EQUAL ONE WHEN WISH TO FILL VACANT O-8 SLOTS ONLY
NOTE     NHX9  = EQUAL ONE WHEN WISH TO FILL TOTAL VACANCIES BY NHZ
NOTE             PERCENT PER YEAR AND ASSIGN TO CLASS BY NHPO PERCENT
NOTE     NHX10 = EQUAL ONE WHEN WISH GREATER OF NHX3 AND NHX9
NOTE     NHX11 = EQUAL ONE WHEN WISH LESSER OF NHX3 AND NHX9
C     NHX1=0
C     NHX2=0
C     NHX3=0
C     NHX4=0
C     NHX5=0
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```
C     NHX6=0
C     NHX7=0
C     NHX8=0
C     NHX9=0
C     NHX10=1
C     NHX11=0
NOTE
A     NH1.K=(NHX1)(NHN1)+(NHX2)(NHPC1)(LO1.K)+(NHX3)(NHPO1)(OUTS.K)+(NHX
X     4)(MIN(NHN1,POUT1.K))+(NHX5)(MIN(NHPC1,POUT1.K))+(NHX6)(MAX(NHN1,P
X     OUT1.K))+(NHX7)(MAX(NHPC1,POUT1.K))+(QNH.K)(NHPO1)(TNH.K)
A     NH2.K=(NHX1)(NHN2)+(NHX2)(NHPC2)(LO2.K)+(NHX3)(NHPO2)(OUTS.K)+(NHX
X     4)(MIN(NHN2,POUT2.K))+(NHX5)(MIN(NHPC2,POUT2.K))+(NHX6)(MAX(NHN2,P
X     OUT2.K))+(NHX7)(MAX(NHPC2,POUT2.K))+(QNH.K)(NHPO2)(TNH.K)
A     NH3.K=(NHX1)(NHN3)+(NHX2)(NHPC3)(LO3.K)+(NHX3)(NHPO3)(OUTS.K)+(NHX
X     4)(MIN(NHN3,POUT3.K))+(NHX5)(MIN(NHPC3,POUT3.K))+(NHX6)(MAX(NHN3,P
X     OUT3.K))+(NHX7)(MAX(NHPC3,POUT3.K))+(QNH.K)(NHPO3)(TNH.K)
A     NH4.K=(NHX1)(NHN4)+(NHX2)(NHPC4)(LO4.K)+(NHX3)(NHPO4)(OUTS.K)+(NHX
X     4)(MIN(NHN4,POUT4.K))+(NHX5)(MIN(NHPC4,POUT4.K))+(NHX6)(MAX(NHN4,P
X     OUT4.K))+(NHX7)(MAX(NHPC4,POUT4.K))+(QNH.K)(NHPO4)(TNH.K)
A     NH5.K=(NHX1)(NHN5)+(NHX2)(NHPC5)(LO5.K)+(NHX3)(NHPO5)(OUTS.K)+(NHX
X     4)(MIN(NHN5,POUT5.K))+(NHX5)(MIN(NHPC5,POUT5.K))+(NHX6)(MAX(NHN5,P
X     OUT5.K))+(NHX7)(MAX(NHPC5,POUT5.K))+(QNH.K)(NHPO5)(TNH.K)
A     NH6.K=(NHX1)(NHN6)+(NHX2)(NHPC6)(LO6.K)+(NHX3)(NHPO6)(OUTS.K)+(NHX
X     4)(MIN(NHN6,POUT6.K))+(NHX5)(MIN(NHPC6,POUT6.K))+(NHX6)(MAX(NHN6,P
X     OUT6.K))+(NHX7)(MAX(NHPC6,POUT6.K))+(QNH.K)(NHPO6)(TNH.K)
A     NH7.K=(NHX1)(NHN7)+(NHX2)(NHPC7)(LO7.K)+(NHX3)(NHPO7)(OUTS.K)+(NHX
X     4)(MIN(NHN7,POUT7.K))+(NHX5)(MIN(NHPC7,POUT7.K))+(NHX6)(MAX(NHN7,P
X     OUT7.K))+(NHX7)(MAX(NHPC7,POUT7.K))+(QNH.K)(NHPO7)(TNH.K)
A     NH8.K=(NHX1)(NHN8)+(NHX2)(NHPC8)(LO8.K)+(NHX3)(NHPO8)(OUTS.K)+(NHX
X     4)(MIN(NHN8,POUT8.K))+(NHX5)(MIN(NHPC8,POUT8.K))+(NHX6)(MAX(NHN8,P
X     OUT8.K))+(NHX7)(MAX(NHPC8,POUT8.K))+(NHX8)(MAX((DL8-LO8.K),NUL))+(
X     QNH.K)(NHPO8)(TNH.K)
NOTE
A     QNH.K=NHX9+NHX10+NHX11
A     TNH.K=(NHX9)(TVAC.K)+(NHX10)(MAX(((NHZ)(TVAC.K)),OUTS.K))+(NHX11)(
X     MIN(((NHZ)(TVAC.K)),OUTS.K))
A     TVAC.K=DL1+DL2+DL3+DL4+DL5+DL6+DL7+DL8-LO1.K-LO2.K-LO3.K-LO4.K-LO5
X     .K-LO6.K-LO7.K-LO8.K+OUTS.K
NOTE
NOTE
C     NHZ=1
NOTE
A     POUT1.K=(NHPO1)(OUTS.K)
A     POUT2.K=(NHPO2)(OUTS.K)
A     POUT3.K=(NHPO3)(OUTS.K)
A     POUT4.K=(NHPO4)(OUTS.K)
A     POUT5.K=(NHPO5)(OUTS.K)
A     POUT6.K=(NHPO6)(OUTS.K)
A     POUT7.K=(NHPO7)(OUTS.K)
A     POUT8.K=(NHPO8)(OUTS.K)
NOTE
C     NHN1=0
C     NHN2=0
C     NHN3=0
C     NHN4=0
C     NHN5=0
C     NHN6=0
C     NHN7=80
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C     NHN8=20
NOTE
C     NHPC1=0
C     NHPC2=0
C     NHPC3=0
C     NHPC4=0
C     NHPC5=0
C     NHPC6=0
C     NHPC7=0.9
C     NHPC8=0.1
NOTE
C     NHPO1=0
C     NHPO2=0
C     NHPO3=0
C     NHPO4=0
C     NHPO5=0
C     NHPO6=0
C     NHPO7=0.9
C     NHPO8=0.1
NOTE
NOTE
NOTE  BASIC INPUT TO THE LATERAL ENTRY SECTOR
NOTE
NOTE     LEN() = NUMBER PER CLASS
NOTE     LEPC()= PERCENT OF CLASS
NOTE     PLPC()= VARIABLE USED TO FACILITATE COMPUTATION
NOTE
NOTE     LEX1  = EQUAL ONE WHEN WISH LEN ONLY
NOTE     LEX2  = EQUAL ONE WHEN WISH LEPC ONLY
NOTE     LEX3  = EQUAL ONE WHEN WISH LESSER OF LEN AN LEPC
NOTE     LEX4  = EQUAL ONE WHEN WISH GREATER OF LEN AND LEPC
C     LEX1=1
C     LEX2=0
C     LEX3=0
C     LEX4=0
NOTE
A     LE1.K=(LEX1)(LEN1)+(LEX2)(LEPC1)(LO1.K)+(LEX3)(MIN(LEN1,PLPC1.K))+
X     (LEX4)(MAX(LEN1,PLPC1.K))
A     LE2.K=(LEX1)(LEN2)+(LEX2)(LEPC2)(LO2.K)+(LEX3)(MIN(LEN2,PLPC2.K))+
X     (LEX4)(MAX(LEN2,PLPC2.K))
A     LE3.K=(LEX1)(LEN3)+(LEX2)(LEPC3)(LO3.K)+(LEX3)(MIN(LEN3,PLPC3.K))+
X     (LEX4)(MAX(LEN3,PLPC3.K))
A     LE4.K=(LEX1)(LEN4)+(LEX2)(LEPC4)(LO4.K)+(LEX3)(MIN(LEN4,PLPC4.K))+
X     (LEX4)(MAX(LEN4,PLPC4.K))
A     LE5.K=(LEX1)(LEN5)+(LEX2)(LEPC5)(LO5.K)+(LEX3)(MIN(LEN5,PLPC5.K))+
X     (LEX4)(MAX(LEN5,PLPC5.K))
A     LE6.K=(LEX1)(LEN6)+(LEX2)(LEPC6)(LO6.K)+(LEX3)(MIN(LEN6,PLPC6.K))+
X     (LEX4)(MAX(LEN6,PLPC6.K))
A     LE7.K=(LEX1)(LEN7)+(LEX2)(LEPC7)(LO7.K)+(LEX3)(MIN(LEN7,PLPC7.K))+
X     (LEX4)(MAX(LEN7,PLPC7.K))
A     LE8.K=(LEX1)(LEN8)+(LEX2)(LEPC8)(LO8.K)+(LEX3)(MIN(LEN8,PLPC8.K))+
X     (LEX4)(MAX(LEN8,PLPC8.K))
NOTE
A     PLPC1.K=(LEPC1)(LO1.K)
A     PLPC2.K=(LEPC2)(LO2.K)
A     PLPC3.K=(LEPC3)(LO3.K)
A     PLPC4.K=(LEPC4)(LO4.K)
A     PLPC5.K=(LEPC5)(LO5.K)
```

```
A     PLPC6.K=(LEPC6)(LO6.K)
A     PLPC7.K=(LEPC7)(LO7.K)
A     PLPC8.K=(LEPC8)(LO8.K)
NOTE
C     LEN1=2
C     LEN2=4
C     LEN3=5
C     LEN4=0
C     LEN5=0
C     LEN6=0
C     LEN7=0
C     LEN8=0
NOTE
C     LEPC1=0.1
C     LEPC2=0.2
C     LEPC3=0.3
C     LEPC4=0
C     LEPC5=0
C     LEPC6=0
C     LEPC7=0
C     LEPC8=0
NOTE
C     PER1P=0
S     PER2P.K=100*(PROM2.K/LO2.K)
S     PER3P.K=100*(PROM3.K/LO3.K)
S     PER4P.K=100*(PROM4.K/LO4.K)
S     PER5P.K=100*(PROM5.K/LO5.K)
S     PER6P.K=100*(PROM6.K/LO6.K)
S     PER7P.K=100*(PROM7.K/LO7.K)
S     PER8P.K=100*(PROM8.K/LO8.K)
NOTE
NOTE  DESIRED LEVEL IN EACH CLASS (FROM INVENTORY VII)
NOTE
C     DL1=404
C     DL2=431
C     DL3=731
C     DL4=871
C     DL5=720
C     DL6=477
C     DL7=321
C     DL8=11
A     SUMDL.K=DL1+DL2+DL3+DL4+DL5+DL6+DL7+DL8
NOTE
NOTE  INITIALIZATION OF PRESENT LEVEL (FROM INVENTORY VII)
NOTE
N     LO1=404
N     LO2=431
N     LO3=731
N     LO4=871
N     LO5=720
N     LO6=477
N     LO7=321
N     LO8=11
A     SUMLO.K=LO1.K+LO2.K+LO3.K+LO4.K+LO5.K+LO6.K+LO7.K+LO8.K
NOTE
NOTE  COMPUTATION OF TOTAL LEAVING SERVICE (OUTS)
NOTE
A     OUTS.K=RET1.K+RET2.K+RET3.K+RET4.K+RET5.K+RET6.K+RET7.K+RET8.K+R1.
```

```
X     K+R2.K+R3.K+R4.K+R5.K+R6.K+R7.K+R8.K+SO1.K+SO2.K+SO3.K+SO4.K+SO5.K
X     +SO6.K+SO7.K+SO8.K-LE1.K-LE2.K-LE3.K-LE4.K-LE5.K-LE6.K-LE7.K-LE8.K
NOTE
NOTE  BUDGT = BUDGET
NOTE
C     BUDGT=10000000
NOTE
C     LENGTH=20
C     PLTPER=1
C     PRTPER=1
PRINT 1)(0,0)DL1,DL2,DL3,DL4,CL5,DL6,DL7,DL8,SUMDL.K
PRINT 2)(0,0)LO1,LO2,LO3,LO4,LO5,LO6,LO7,LO8,SUMLO.K
PRINT 3)(0,0)PROM1,PROM2,PROM3,PROM4,PROM5,PROM6,PROM7,PROM8
PRINT 4)(0,0)PER1P,PER2P,PER3P,PER4P,PER5P,PER6P,PER7P,PER8P
PRINT 5)(0,0)NH1,NH2,NH3,NH4,NH5,NH6,NH7,NH8
PRINT 6)(0,0)LE1,LE2,LE3,LE4,LE5,LE6,LE7,LE8
PRINT 7)(0,0)RET1,RET2,RET3,RET4,RET5,RET6,RET7,RET8
PRINT 8)(0,0)R1,R2,R3,R4,R5,R6,R7,R8
PRINT 9)(0,0)SO1,SO2,SO3,SO4,SO5,SO6,SO7,SO8
PLOT  LO1=1,LO2=2,LO3=3,LO4=4,LO5=5,LO6=6,LO7=7,LO8=8
PLOT  PROM2=2,PROM3=3,PROM4=4,PROM5=5,PROM6=6,PROM7=7,PROM8=8
PLOT  PER1P,PER2P,PER3P,PER4P,PER5P,PER6P,PER7P,PER8P
PLOT  NH1=1,NH2=2,NH3=3,NH4=4,NH5=5,NH6=6,NH7=7,NH8=8
PLOT  LE1=1,LE2=2,LE3=3,LE4=4,LE5=5,LE6=6,LE7=7,LE8=8
PLOT  RET1=1,RET2=2,RET3=3,RET4=4,RET5=5,RET6=6,RET7=7,RET8=8
PLOT  R1=1,R2=2,R3=3,R4=4,R5=5,R6=6,R7=7,R8=8
PLOT  SO1=1,SO2=2,SO3=3,SO4=4,SO5=5,SO6=6,SO7=7,SO8=8
PLOT  RET1=R,R1=X,PROM1=P,NH1=N,LE1=L,SO1=S,LO1=1,DL1=D
PLOT  RET2=R,R2=X,PROM2=P,NH2=N,LE2=L,SO2=S,LO2=2,DL2=D
PLOT  RET3=R,R3=X,PROM3=P,NH3=N,LE3=L,SO3=S,LO3=3,DL3=D
PLOT  RET4=R,R4=X,PROM4=P,NH4=N,LE4=L,SO4=S,LO4=4,DL4=D
PLOT  RET5=R,R5=X,PROM5=P,NH5=N,LE5=L,SO5=S,LO5=5,DL5=D
PLOT  RET6=R,R6=X,PROM6=P,NH6=N,LE6=L,SO6=S,LO6=6,DL6=D
PLOT  RET7=R,R7=X,PROM7=P,NH7=N,LE7=L,SO7=S,LO7=7,DL7=D
PLOT  RET8=R,R8=X,PROM8=P,NH8=N,LE8=L,SO8=S,LO8=8,DL8=D
NOTE
C     DT=0.2
NOTE
C     NUL=0
NOTE
RUN   WITH 06 AND 03 THRESHHOLD SELECTION OUT
```

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00							
.0	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	9.	0.	0.
	731.	731.	17.	2.	0.	5.	14.	0.	164.
	871.	871.	190.	22.	0.	0.	0.	8.	0.
	720.	720.	197.	27.	0.	0.	0.	7.	0.
	477.	477.	205.	43.	0.	0.	0.	26.	112.
	321.	321.	321.	100.	323.	0.	0.	14.	0.
	11.	11.	11.	100.	36.	0.	0.	3.	0.
	3966.	3966.							
1.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	9.	0.	0.
	731.	731.	19.	3.	0.	5.	16.	0.	164.
	871.	871.	195.	22.	0.	0.	0.	9.	0.
	720.	720.	204.	28.	0.	0.	0.	7.	0.
	477.	470.	211.	45.	0.	0.	0.	30.	93.
	321.	315.	315.	100.	317.	0.	0.	12.	0.
	11.	24.	16.	67.	35.	0.	0.	6.	0.
	3966.	3966.							
2.	404.	404.	0.	0.	0.	2.	19.	0.	0.
	431.	431.	17.	4.	0.	4.	9.	0.	0.
	731.	731.	22.	3.	0.	5.	16.	0.	112.
	871.	871.	145.	17.	0.	0.	0.	7.	0.
	720.	720.	152.	21.	0.	0.	0.	7.	0.
	477.	462.	159.	35.	0.	0.	0.	29.	87.
	321.	318.	291.	91.	265.	0.	0.	12.	0.
	11.	29.	29.	100.	29.	0.	0.	7.	0.
	3966.	3966.							

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
3.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	3.	0.	5.	15.	0.	162.
	871.	871.	191.	22.	0.	0.	0.	8.	0.
	720.	720.	199.	28.	0.	0.	0.	8.	0.
	477.	466.	207.	44.	0.	0.	0.	25.	113.
	321.	316.	316.	100.	328.	0.	0.	13.	0.
	11.	27.	6.	23.	36.	0.	0.	7.	0.
	3966.	3966.							
4.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	8.	0.	0.
	731.	731.	20.	3.	0.	5.	13.	0.	154.
	871.	871.	182.	21.	0.	0.	0.	9.	0.
	720.	720.	192.	27.	0.	0.	0.	7.	0.
	477.	461.	199.	43.	0.	0.	0.	30.	88.
	321.	318.	318.	100.	304.	0.	0.	13.	0.
	11.	31.	30.	97.	34.	0.	0.	8.	0.
	3966.	3966.							
5.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	2.	0.	5.	15.	0.	141.
	871.	871.	169.	19.	0.	0.	0.	9.	0.
	720.	720.	179.	25.	0.	0.	0.	6.	0.
	477.	465.	185.	40.	0.	0.	0.	26.	120.
	321.	317.	317.	100.	316.	0.	0.	13.	0.
	11.	27.	18.	68.	35.	0.	0.	7.	0.
	3966.	3966.							
6.	404.	404.	0.	0.	0.	2.	17.	0.	0.
	431.	431.	15.	3.	0.	4.	7.	0.	0.
	731.	731.	18.	2.	0.	5.	14.	0.	149.
	871.	871.	176.	20.	0.	0.	0.	8.	0.
	720.	720.	185.	26.	0.	0.	0.	6.	0.
	477.	459.	191.	42.	0.	0.	0.	28.	87.
	321.	318.	318.	100.	295.	0.	0.	14.	0.
	11.	32.	32.	100.	33.	0.	0.	9.	0.
	3966.	3966.							

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	S01
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	S02
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	S03
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	S04
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	S05
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	S06
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	S07
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	S08
	SUMDL	SUMLO							
7.	404.	404.	0.	0.	0.	2.	17.	0.	0.
	431.	431.	15.	3.	0.	4.	10.	0.	0.
	731.	731.	20.	3.	0.	5.	16.	0.	161.
	871.	871.	192.	22.	0.	0.	0.	9.	0.
	720.	720.	202.	28.	0.	0.	0.	7.	0.
	477.	466.	209.	45.	0.	0.	0.	30.	101.
	321.	315.	315.	100.	325.	0.	0.	14.	0.
	11.	27.	10.	36.	36.	0.	0.	8.	0.
	3966.	3966.							
8.	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	8.	0.	0.
	731.	731.	16.	2.	0.	5.	15.	0.	129.
	871.	871.	154.	18.	0.	0.	0.	9.	0.
	720.	720.	163.	23.	0.	0.	0.	9.	0.
	477.	465.	172.	37.	0.	0.	0.	27.	110.
	321.	314.	314.	100.	297.	0.	0.	13.	0.
	11.	29.	29.	100.	33.	0.	0.	8.	0.
	3966.	3966.							
9.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	8.	0.	0.
	731.	731.	18.	2.	0.	5.	15.	0.	148.
	871.	871.	175.	20.	0.	0.	0.	9.	0.
	720.	720.	184.	26.	0.	0.	0.	7.	0.
	477.	468.	191.	41.	0.	0.	0.	23.	107.
	321.	314.	314.	100.	306.	0.	0.	11.	0.
	11.	27.	27.	100.	34.	0.	0.	7.	0.
	3966.	3966.							
10.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	10.	0.	0.
	731.	731.	22.	3.	0.	5.	15.	0.	185.
	871.	871.	216.	25.	0.	0.	0.	9.	0.
	720.	720.	225.	31.	0.	0.	0.	7.	0.
	477.	473.	232.	49.	0.	0.	0.	24.	92.
	321.	311.	311.	100.	329.	0.	0.	12.	0.
	11.	25.	3.	13.	37.	0.	0.	6.	0.
	3966.	3966.							

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
11.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	11.	0.	0.
	731.	731.	19.	3.	0.	5.	16.	0.	109.
	871.	871.	140.	16.	0.	0.	0.	7.	0.
	720.	720.	147.	20.	0.	0.	0.	9.	0.
	477.	468.	156.	33.	0.	0.	0.	28.	72.
	321.	313.	265.	85.	248.	0.	0.	13.	0.
	11.	29.	29.	100.	28.	0.	0.	7.	0.
	3966.	3966.							
12.	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	8.	0.	0.
	731.	731.	17.	2.	0.	5.	12.	0.	128.
	871.	871.	152.	17.	0.	0.	0.	9.	0.
	720.	720.	161.	22.	0.	0.	0.	6.	0.
	477.	460.	167.	36.	0.	0.	0.	28.	89.
	321.	316.	301.	96.	275.	0.	0.	12.	0.
	11.	34.	34.	100.	31.	0.	0.	9.	0.
	3966.	3966.							
13.	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	9.	0.	0.
	731.	731.	17.	2.	0.	5.	12.	0.	105.
	871.	871.	129.	15.	0.	0.	0.	8.	0.
	720.	720.	137.	19.	0.	0.	0.	7.	0.
	477.	458.	144.	31.	0.	0.	0.	27.	87.
	321.	317.	277.	87.	252.	0.	0.	13.	0.
	11.	34.	34.	100.	28.	0.	0.	9.	0.
	3966.	3966.							
14.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	9.	0.	0.
	731.	731.	21.	3.	0.	5.	15.	0.	172.
	871.	871.	203.	23.	0.	0.	0.	8.	0.
	720.	720.	211.	29.	0.	0.	0.	8.	0.
	477.	463.	219.	47.	0.	0.	0.	30.	84.
	321.	316.	316.	100.	319.	0.	0.	12.	0.
	11.	30.	14.	47.	35.	0.	0.	9.	0.
	3966.	3966.							

PAGE 17 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

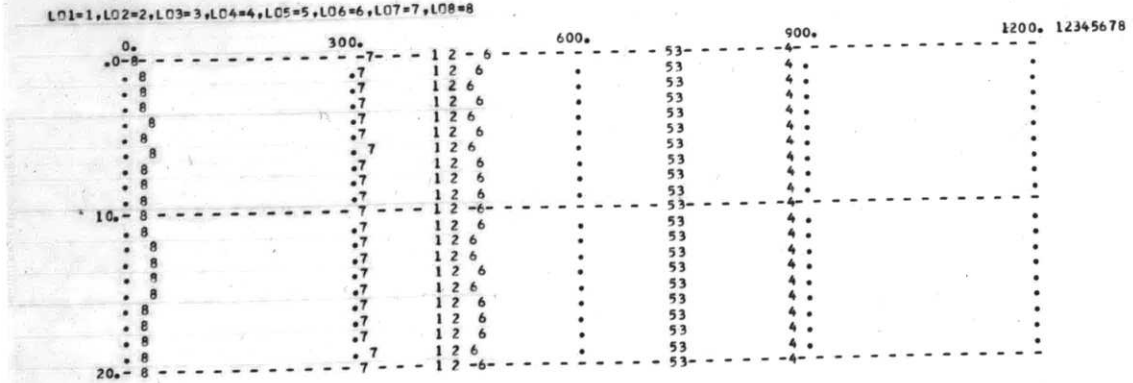
TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
15.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	2.	0.	5.	16.	0.	121.
	871.	871.	150.	17.	0.	0.	0.	10.	0.
	720.	720.	159.	22.	0.	0.	0.	6.	0.
	477.	457.	165.	36.	0.	0.	0.	26.	112.
	321.	317.	317.	100.	292.	0.	0.	12.	0.
	11.	34.	34.	100.	32.	0.	0.	10.	0.
	3966.	3966.							
16.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	7.	0.	0.
	731.	731.	17.	2.	0.	5.	18.	0.	124.
	871.	871.	154.	18.	0.	0.	0.	9.	0.
	720.	720.	163.	23.	0.	0.	0.	8.	0.
	477.	470.	170.	36.	0.	0.	0.	30.	92.
	321.	312.	299.	96.	280.	0.	0.	12.	0.
	11.	27.	27.	100.	31.	0.	0.	7.	0.
	3966.	3966.							
17.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	9.	0.	0.
	731.	731.	21.	3.	0.	5.	15.	0.	130.
	871.	871.	161.	18.	0.	0.	0.	9.	0.
	720.	720.	170.	24.	0.	0.	0.	8.	0.
	477.	470.	178.	38.	0.	0.	0.	27.	94.
	321.	312.	306.	98.	287.	0.	0.	13.	0.
	11.	26.	26.	100.	32.	0.	0.	7.	0.
	3966.	3966.							
18.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	3.	0.	5.	13.	0.	154.
	871.	871.	180.	21.	0.	0.	0.	8.	0.
	720.	720.	188.	26.	0.	0.	0.	8.	0.
	477.	467.	196.	42.	0.	0.	0.	29.	89.
	321.	314.	314.	100.	300.	0.	0.	12.	0.
	11.	29.	29.	100.	33.	0.	0.	8.	0.
	3966.	3966.							

PAGE 18 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	S01
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	S02
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	S03
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	S04
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	S05
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	S06
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	S07
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	S08
	SUMDL	SUMLO							
19.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	9.	0.	0.
	731.	731.	21.	3.	0.	5.	17.	0.	127.
	871.	871.	160.	18.	0.	0.	0.	7.	0.
	720.	720.	167.	23.	0.	0.	0.	7.	0.
	477.	461.	174.	38.	0.	0.	0.	25.	94.
	321.	318.	309.	97.	283.	0.	0.	13.	0.
	11.	29.	29.	100.	31.	0.	0.	8.	0.
	3966.	3966.							
20.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	8.	0.	0.
	731.	731.	18.	2.	0.	5.	14.	0.	125.
	871.	871.	152.	17.	0.	0.	0.	8.	0.
	720.	720.	161.	22.	0.	0.	0.	7.	0.
	477.	467.	168.	36.	0.	0.	0.	28.	94.
	321.	314.	300.	95.	278.	0.	0.	12.	0.
	11.	28.	28.	100.	31.	0.	0.	8.	0.
	3966.	3966.							

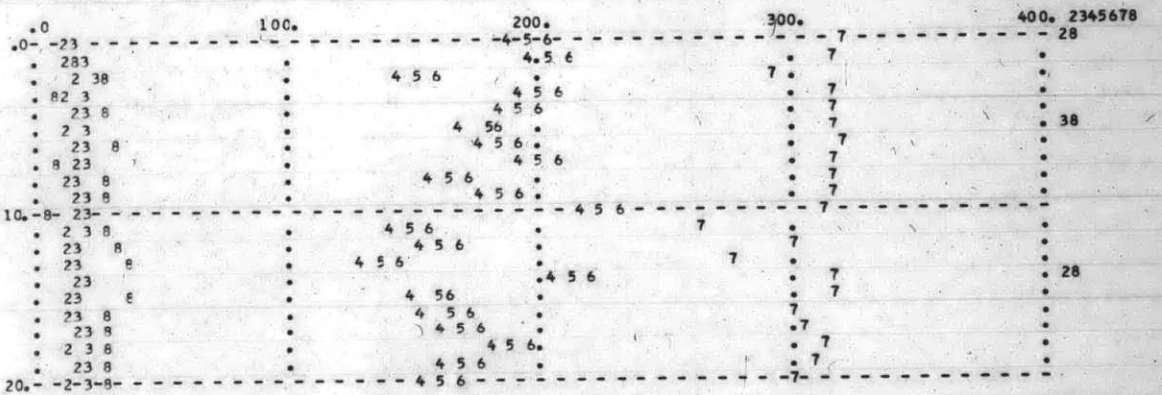
PAGE 19 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

L01=1,L02=2,L03=3,L04=4,L05=5,L06=6,L07=7,L08=8



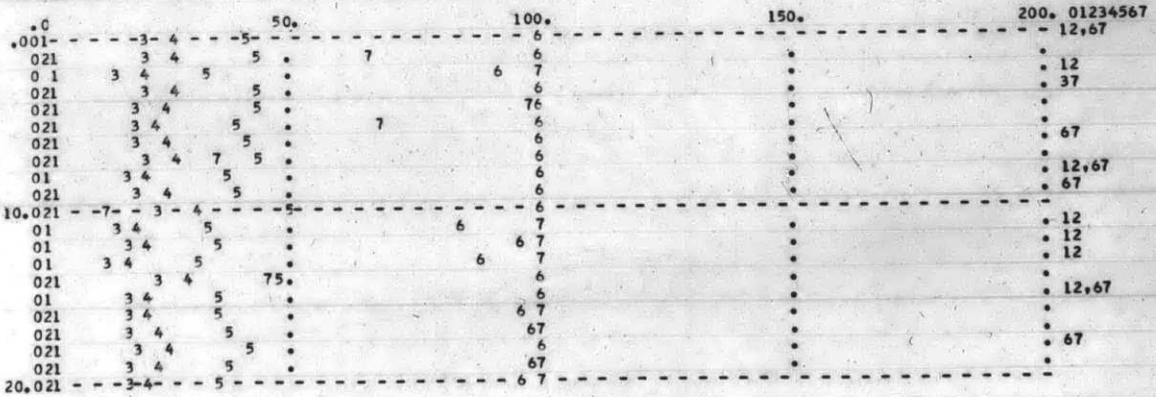
PAGE 20 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

PROM2=2, PROM3=3, PROM4=4, PROM5=5, PROM6=6, PROM7=7, PROM8=8



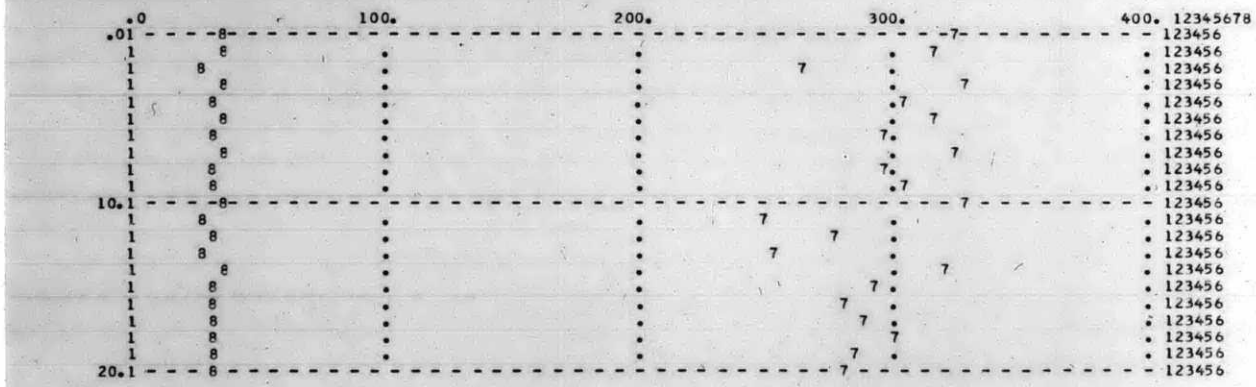
PAGE 21 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

PER1P=0, PER2P=1, PER3P=2, PER4P=3, PER5P=4, PER6P=5, PER7P=6, PER8P=7



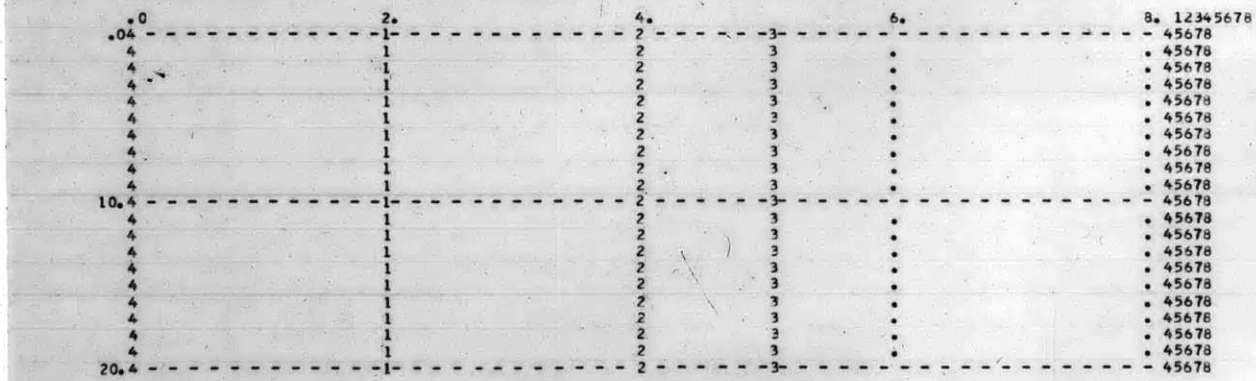
PAGE 22 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

NH1=1,NH2=2,NH3=3,NH4=4,NH5=5,NH6=6,NH7=7,NH8=8



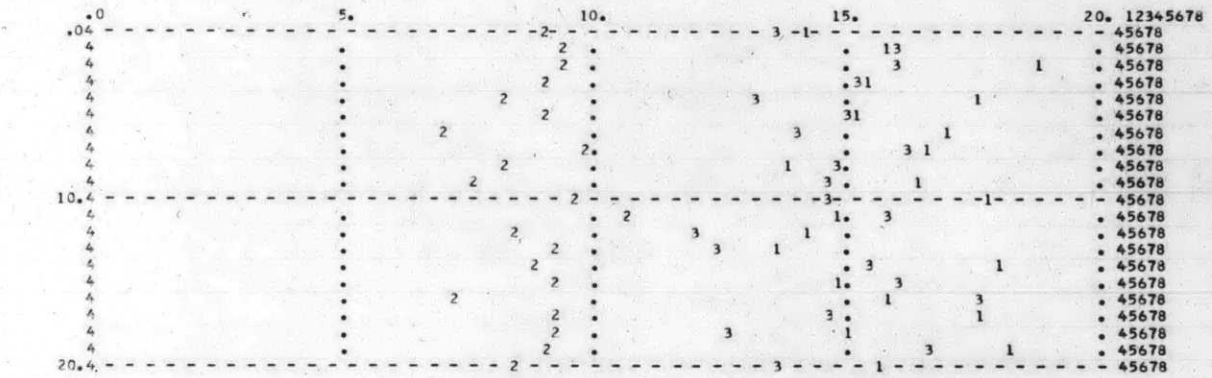
PAGE 23 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

LE1=1,LE2=2,LE3=3,LE4=4,LE5=5,LE6=6,LE7=7,LE8=8



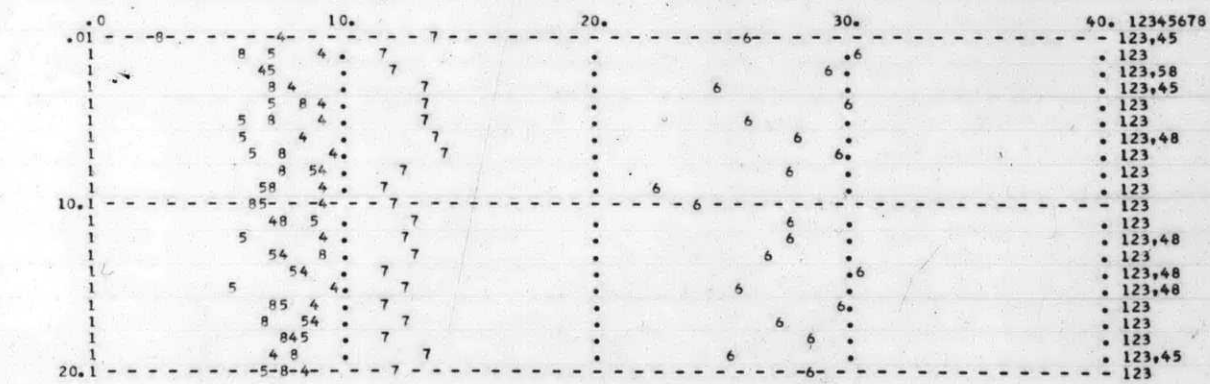
PAGE 24 6/23/72 . WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET1=1,RET2=2,RET3=3,RET4=4,RET5=5,RET6=6,RET7=7,RET8=8



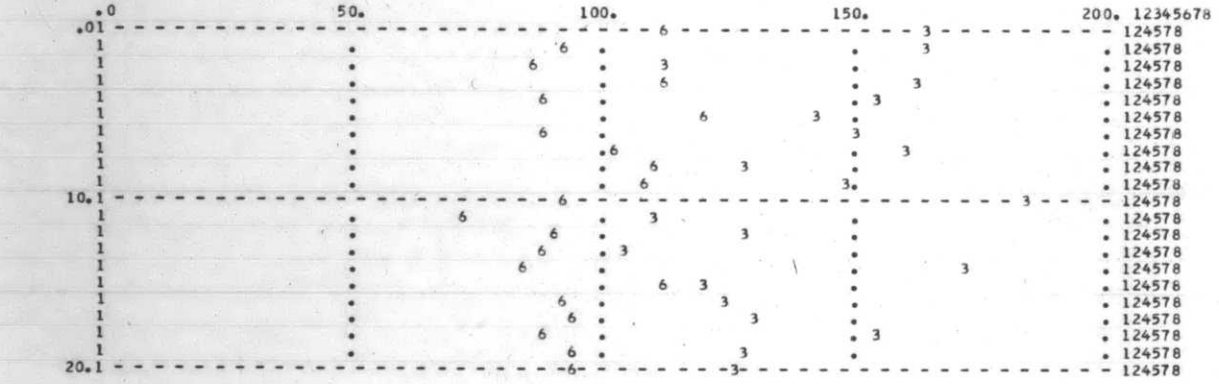
PAGE 25 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

R1=1,R2=2,R3=3,R4=4,R5=5,R6=6,R7=7,R8=8



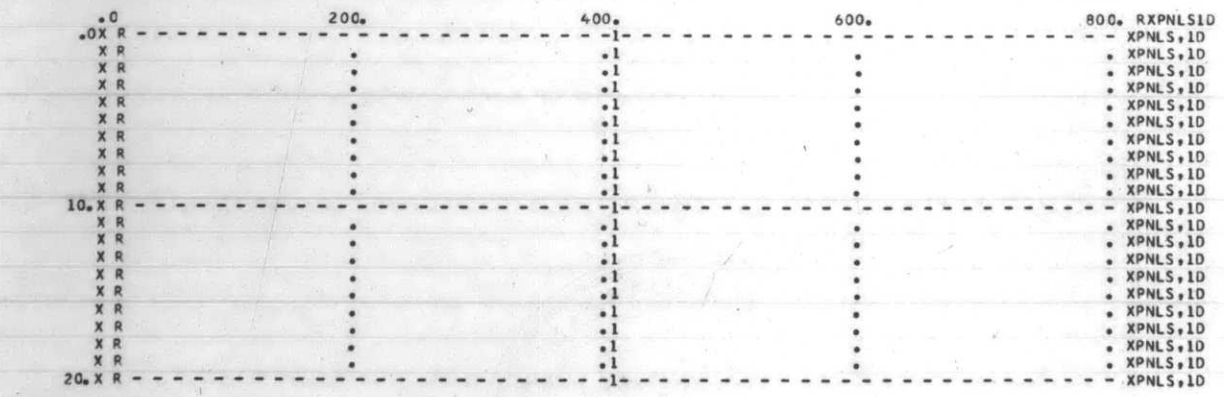
PAGE 26 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

S01=1,S02=2,S03=3,S04=4,S05=5,S06=6,S07=7,S08=8



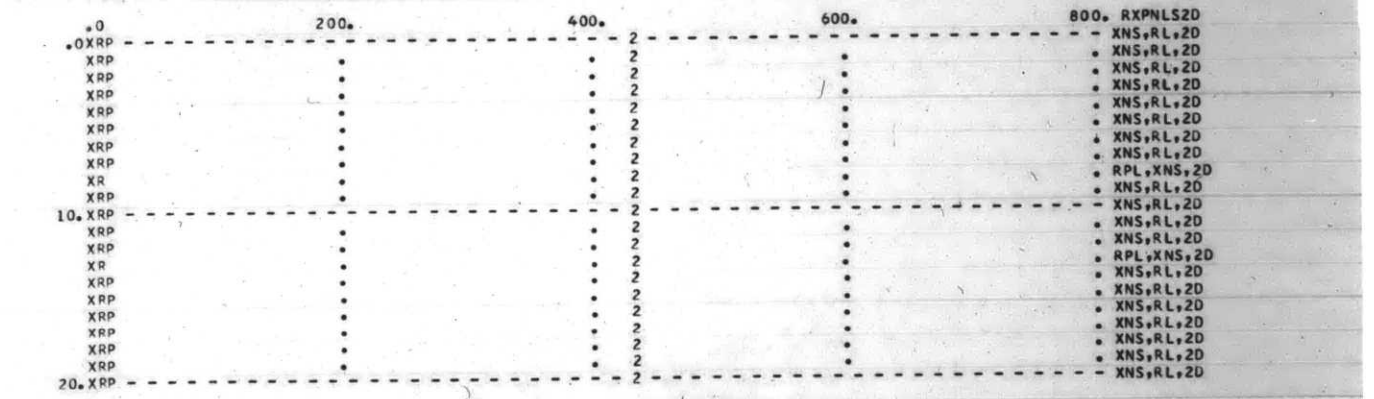
PAGE 27 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET1=R,R1=X,PROM1=P,NH1=N,LE1=L,SO1=S,LO1=1,DL1=D



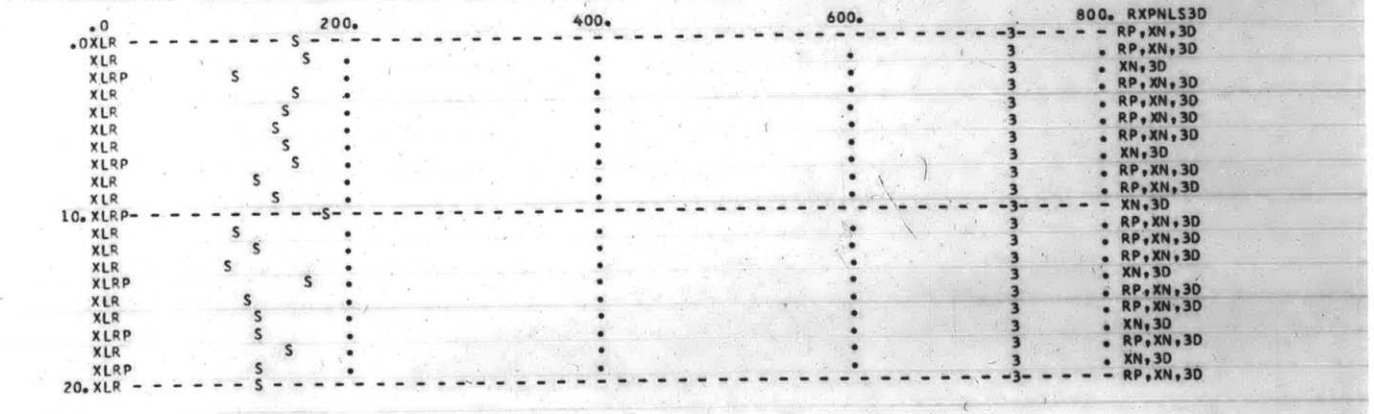
PAGE 28 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET2=R,R2=X,PROM2=P,NH2=N,LE2=L,SC2=S,LC2=2,DL2=D



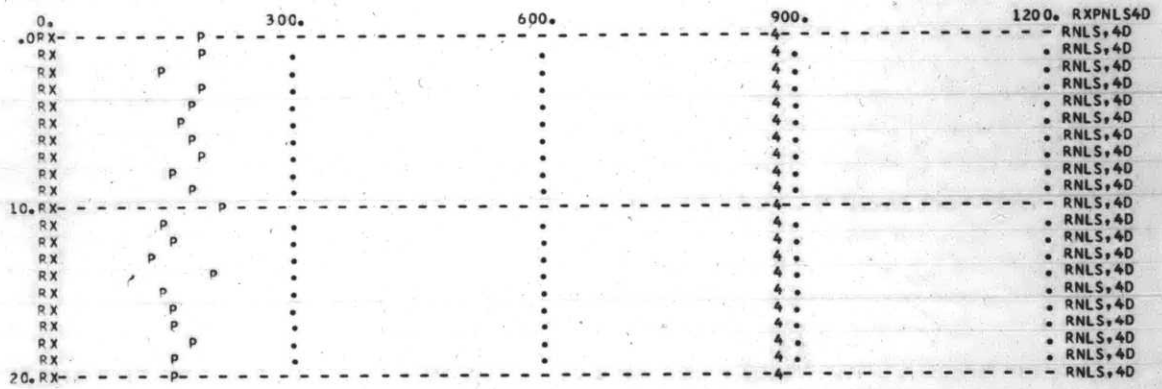
PAGE 29 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET3=R,R3=X,PROM3=P,NH3=N,LE3=L,SC3=S,LC3=3,DL3=D



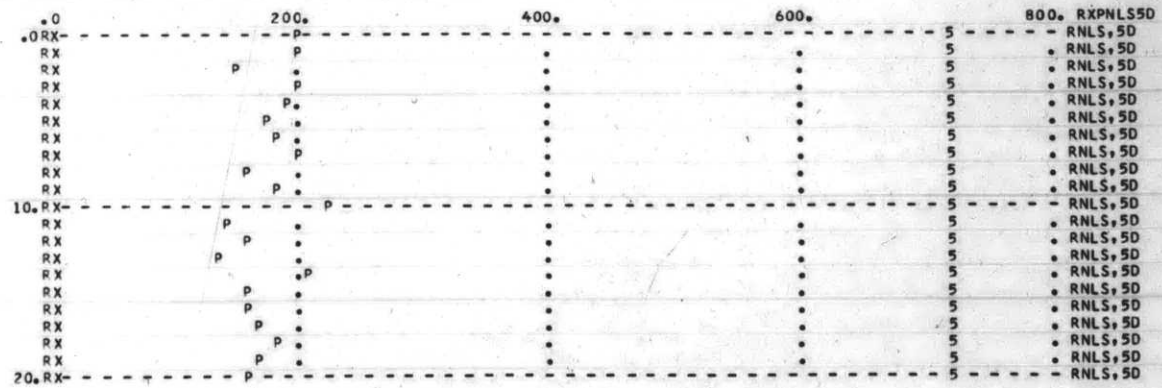
PAGE 30 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET4=R,R4=X,PROM4=P,NH4=N,LE4=L,SO4=S,LO4=4,DL4=D



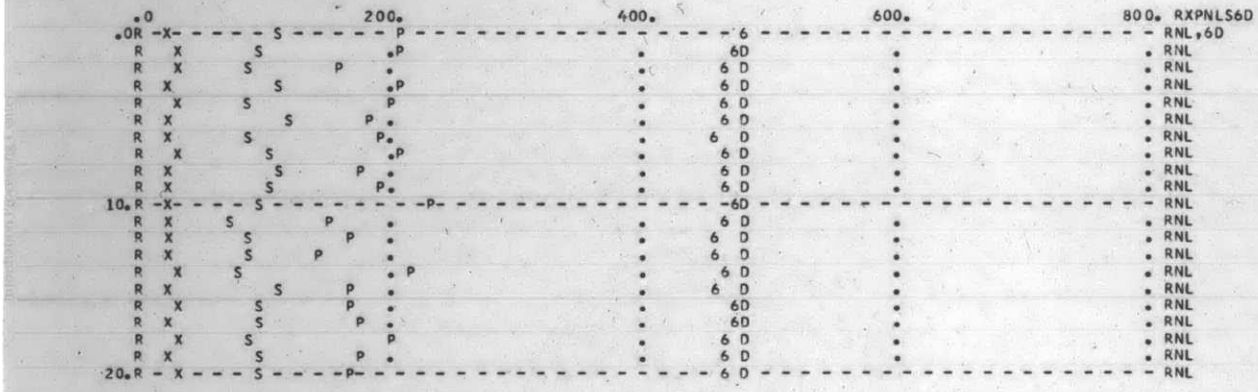
PAGE 31 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET5=R,R5=X,PROM5=P,NH5=N,LE5=L,SO5=S,LO5=5,DL5=D



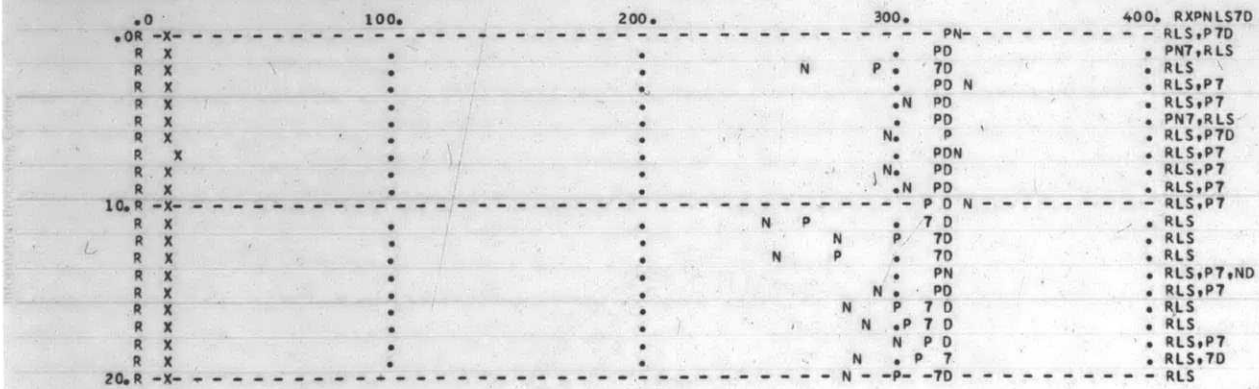
PAGE 32 6/23/72 WITH D6 AND D3 THRESHHOLD SELECTION OUT

RET6=R,R6=X,PROM6=P,NH6=N,LE6=L,SC6=S,LO6=6,DL6=D



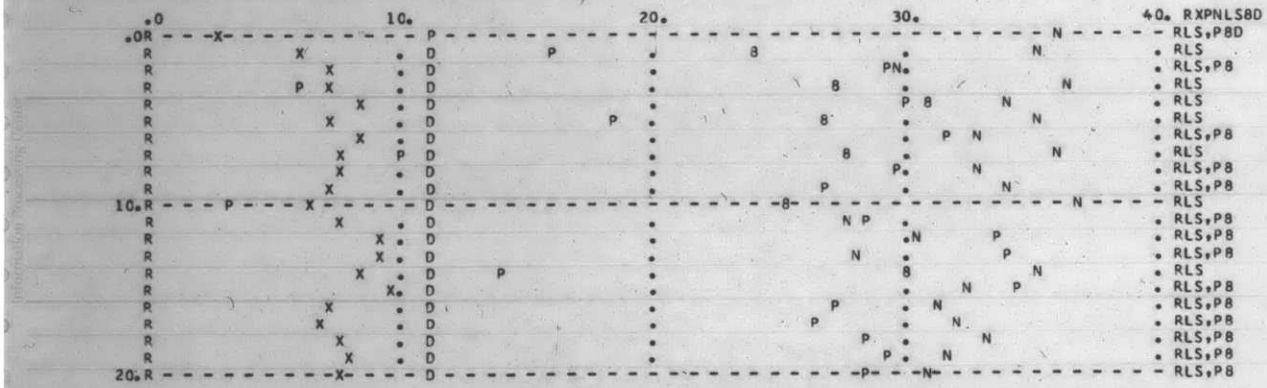
PAGE 33 6/23/72 WITH D6 AND D3 THRESHHOLD SELECTION OUT

RET7=R,R7=X,PROM7=P,NH7=N,LE7=L,SC7=S,LO7=7,DL7=D



PAGE 34 6/23/72 WITH 06 AND 03 THRESHHOLD SELECTION OUT

RET8=R,R8=X,PROM8=P,NH8=N,LE8=L,SC8=S,LO8=8,DL8=D



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```
        C     SOX3=0
        C     SOX2=1
        RUN   BOTTOM FIVE PERCENT SELECTED OUT

              SOX3     SOX2
PRESENT         0.    1.000
ORIGINAL    1.000       0.
```

 BOTTOM FIVE PERCENT SELECTED OUT

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00							
.0	404.	404.	0.	0.	0.	2.	14.	0.	20.
	431.	431.	32.	8.	0.	4.	9.	0.	22.
	731.	731.	59.	8.	0.	5.	14.	0.	37.
	871.	871.	104.	12.	0.	0.	0.	8.	44.
	720.	720.	155.	22.	0.	0.	0.	7.	36.
	477.	477.	199.	42.	0.	0.	0.	26.	24.
	321.	321.	249.	77.	254.	0.	0.	14.	16.
	11.	11.	11.	100.	28.	0.	0.	3.	1.
	3966.	3966.							
1.	404.	404.	0.	0.	0.	2.	16.	0.	20.
	431.	431.	34.	8.	0.	4.	9.	0.	22.
	731.	731.	61.	8.	0.	5.	16.	0.	37.
	871.	871.	109.	12.	0.	0.	0.	9.	44.
	720.	720.	162.	22.	0.	0.	0.	7.	36.
	477.	477.	205.	43.	0.	0.	0.	31.	24.
	321.	312.	259.	83.	263.	0.	0.	12.	16.
	11.	20.	20.	100.	29.	0.	0.	5.	1.
	3966.	3966.							
2.	404.	404.	0.	0.	0.	2.	19.	0.	20.
	431.	431.	37.	9.	0.	4.	9.	0.	22.
	731.	731.	64.	9.	0.	5.	16.	0.	37.
	871.	871.	111.	13.	0.	0.	0.	7.	44.
	720.	720.	162.	22.	0.	0.	0.	7.	36.
	477.	477.	205.	43.	0.	0.	0.	30.	24.
	321.	311.	259.	83.	263.	0.	0.	12.	16.
	11.	21.	21.	100.	29.	0.	0.	5.	1.
	3966.	3966.							

PAGE 37 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

TIME	DL1	LO1	PRCM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PRCM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PRCM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PRCM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PRCM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PRCM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PRCM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PRCM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
3.	404.	404.	0.	0.	0.	2.	15.	0.	20.
	431.	431.	34.	8.	0.	4.	9.	0.	22.
	731.	731.	60.	8.	0.	5.	15.	0.	37.
	871.	871.	107.	12.	0.	0.	0.	8.	44.
	720.	720.	159.	22.	0.	0.	0.	8.	36.
	477.	477.	203.	42.	0.	0.	0.	26.	24.
	321.	310.	252.	81.	258.	0.	0.	13.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
4.	404.	404.	0.	0.	0.	2.	18.	0.	20.
	431.	431.	36.	8.	0.	4.	8.	0.	22.
	731.	731.	62.	8.	0.	5.	13.	0.	37.
	871.	871.	106.	12.	0.	0.	0.	9.	44.
	720.	720.	159.	22.	0.	0.	0.	7.	36.
	477.	477.	203.	42.	0.	0.	0.	31.	24.
	321.	310.	258.	83.	264.	0.	0.	13.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
5.	404.	404.	0.	0.	0.	2.	15.	0.	20.
	431.	431.	33.	8.	0.	4.	9.	0.	22.
	731.	731.	60.	8.	0.	5.	15.	0.	37.
	871.	871.	106.	12.	0.	0.	0.	9.	44.
	720.	720.	159.	22.	0.	0.	0.	5.	36.
	477.	477.	201.	42.	0.	0.	0.	27.	24.
	321.	310.	252.	81.	259.	0.	0.	13.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
6.	404.	404.	0.	0.	0.	2.	17.	0.	20.
	431.	431.	35.	8.	0.	4.	7.	0.	22.
	731.	731.	60.	8.	0.	5.	14.	0.	37.
	871.	871.	105.	12.	0.	0.	0.	8.	44.
	720.	720.	157.	22.	0.	0.	0.	6.	36.
	477.	477.	199.	42.	0.	0.	0.	29.	24.
	321.	310.	252.	81.	259.	0.	0.	13.	15.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
7.	404.	404.	0.	0.	0.	2.	17.	0.	20.
	431.	431.	35.	8.	0.	4.	10.	0.	22.
	731.	731.	62.	9.	0.	5.	16.	0.	37.
	871.	871.	110.	13.	0.	0.	0.	9.	44.
	720.	720.	163.	23.	0.	0.	0.	7.	36.
	477.	477.	206.	43.	0.	0.	0.	30.	24.
	321.	310.	260.	84.	267.	0.	0.	14.	16.
	11.	22.	22.	100.	30.	0.	0.	6.	1.
	3966.	3966.							
8.	404.	404.	0.	0.	0.	2.	14.	0.	20.
	431.	431.	32.	7.	0.	4.	8.	0.	22.
	731.	731.	58.	8.	0.	5.	15.	0.	37.
	871.	871.	104.	12.	0.	0.	0.	9.	44.
	720.	720.	157.	22.	0.	0.	0.	9.	36.
	477.	477.	202.	42.	0.	0.	0.	28.	24.
	321.	310.	254.	82.	260.	0.	0.	12.	15.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
9.	404.	404.	0.	0.	0.	2.	16.	0.	20.
	431.	431.	35.	8.	0.	4.	8.	0.	22.
	731.	731.	60.	8.	0.	5.	15.	0.	37.
	871.	871.	106.	12.	0.	0.	0.	9.	44.
	720.	720.	159.	22.	0.	0.	0.	7.	36.
	477.	477.	201.	42.	0.	0.	0.	23.	24.
	321.	310.	248.	80.	254.	0.	0.	11.	16.
	11.	22.	22.	100.	28.	0.	0.	6.	1.
	3966.	3966.							
10.	404.	404.	0.	0.	0.	2.	18.	0.	20.
	431.	431.	36.	8.	0.	4.	10.	0.	22.
	731.	731.	63.	9.	0.	5.	15.	0.	37.
	871.	871.	109.	13.	0.	0.	0.	9.	44.
	720.	720.	162.	22.	0.	0.	0.	7.	36.
	477.	477.	205.	43.	0.	0.	0.	24.	24.
	321.	310.	253.	82.	258.	0.	0.	12.	16.
	11.	22.	22.	100.	29.	0.	0.	5.	1.
	3966.	3966.							

PAGE 39 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
11.	404.	404.	0.	0.	0.	2.	15.	0.	20.
	431.	431.	33.	8.	0.	4.	11.	0.	22.
	731.	731.	61.	8.	0.	5.	16.	0.	37.
	871.	871.	109.	12.	0.	0.	0.	7.	44.
	720.	720.	159.	22.	0.	0.	0.	9.	36.
	477.	477.	204.	43.	0.	0.	0.	28.	24.
	321.	310.	256.	83.	262.	0.	0.	13.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
12.	404.	404.	0.	0.	0.	2.	14.	0.	20.
	431.	431.	32.	8.	0.	4.	8.	0.	22.
	731.	731.	58.	8.	0.	5.	12.	0.	37.
	871.	871.	102.	12.	0.	0.	0.	9.	44.
	720.	720.	155.	22.	0.	0.	0.	6.	36.
	477.	477.	197.	41.	0.	0.	0.	29.	24.
	321.	310.	249.	80.	256.	0.	0.	12.	16.
	11.	22.	22.	100.	28.	0.	0.	6.	1.
	3966.	3966.							
13.	404.	404.	0.	0.	0.	2.	14.	0.	20.
	431.	431.	32.	7.	0.	4.	9.	0.	22.
	731.	731.	59.	8.	0.	5.	12.	0.	37.
	871.	871.	102.	12.	0.	0.	0.	8.	44.
	720.	720.	154.	21.	0.	0.	0.	7.	36.
	477.	477.	197.	41.	0.	0.	0.	28.	24.
	321.	310.	249.	80.	255.	0.	0.	13.	16.
	11.	22.	22.	100.	28.	0.	0.	6.	1.
	3966.	3966.							
14.	404.	404.	0.	0.	0.	2.	18.	0.	20.
	431.	431.	36.	8.	0.	4.	9.	0.	22.
	731.	731.	62.	9.	0.	5.	15.	0.	37.
	871.	871.	109.	13.	0.	0.	0.	8.	44.
	720.	720.	161.	22.	0.	0.	0.	8.	36.
	477.	477.	205.	43.	0.	0.	0.	31.	24.
	321.	310.	260.	84.	265.	0.	0.	11.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							

PAGE 40 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

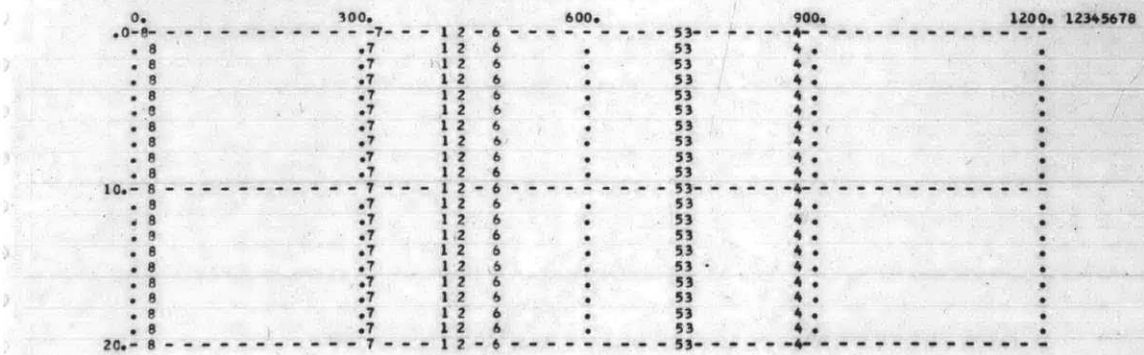
TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
15.	404.	404.	0.	0.	0.	2.	15.	0.	20.
	431.	431.	33.	8.	0.	4.	9.	0.	22.
	731.	731.	60.	8.	0.	5.	16.	0.	37.
	871.	871.	107.	12.	0.	0.	0.	10.	44.
	720.	720.	160.	22.	0.	0.	0.	6.	36.
	477.	477.	202.	42.	0.	0.	0.	27.	24.
	321.	310.	253.	82.	259.	0.	0.	12.	15.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
16.	404.	404.	0.	0.	0.	2.	16.	0.	20.
	431.	431.	34.	8.	0.	4.	7.	0.	22.
	731.	731.	59.	8.	0.	5.	18.	0.	37.
	871.	871.	108.	12.	0.	0.	0.	9.	44.
	720.	720.	160.	22.	0.	0.	0.	8.	36.
	477.	477.	204.	43.	0.	0.	0.	30.	24.
	321.	310.	258.	83.	263.	0.	0.	12.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
17.	404.	404.	0.	0.	0.	2.	18.	0.	20.
	431.	431.	36.	8.	0.	4.	9.	0.	22.
	731.	731.	63.	9.	0.	5.	15.	0.	37.
	871.	871.	109.	12.	0.	0.	0.	9.	44.
	720.	720.	161.	22.	0.	0.	0.	8.	36.
	477.	477.	205.	43.	0.	0.	0.	28.	24.
	321.	310.	257.	83.	262.	0.	0.	12.	15.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
18.	404.	404.	0.	0.	0.	2.	15.	0.	20.
	431.	431.	33.	8.	0.	4.	9.	0.	22.
	731.	731.	60.	8.	0.	5.	13.	0.	37.
	871.	871.	104.	12.	0.	0.	0.	8.	44.
	720.	720.	156.	22.	0.	0.	0.	8.	36.
	477.	477.	200.	42.	0.	0.	0.	29.	24.
	321.	310.	253.	82.	259.	0.	0.	12.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							

PAGE 41 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
19.	404.	404.	0.	0.	0.	2.	18.	0.	20.
	431.	431.	36.	8.	0.	4.	9.	0.	22.
	731.	731.	63.	9.	0.	5.	17.	0.	37.
	871.	871.	111.	13.	0.	0.	0.	7.	44.
	720.	720.	162.	22.	0.	0.	0.	7.	36.
	477.	477.	205.	43.	0.	0.	0.	26.	24.
	321.	310.	255.	82.	261.	0.	0.	13.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							
20.	404.	404.	0.	0.	0.	2.	16.	0.	20.
	431.	431.	34.	8.	0.	4.	8.	0.	22.
	731.	731.	60.	8.	0.	5.	14.	0.	37.
	871.	871.	105.	12.	0.	0.	0.	8.	44.
	720.	720.	157.	22.	0.	0.	0.	7.	36.
	477.	477.	200.	42.	0.	0.	0.	29.	24.
	321.	310.	253.	81.	258.	0.	0.	12.	16.
	11.	22.	22.	100.	29.	0.	0.	6.	1.
	3966.	3966.							

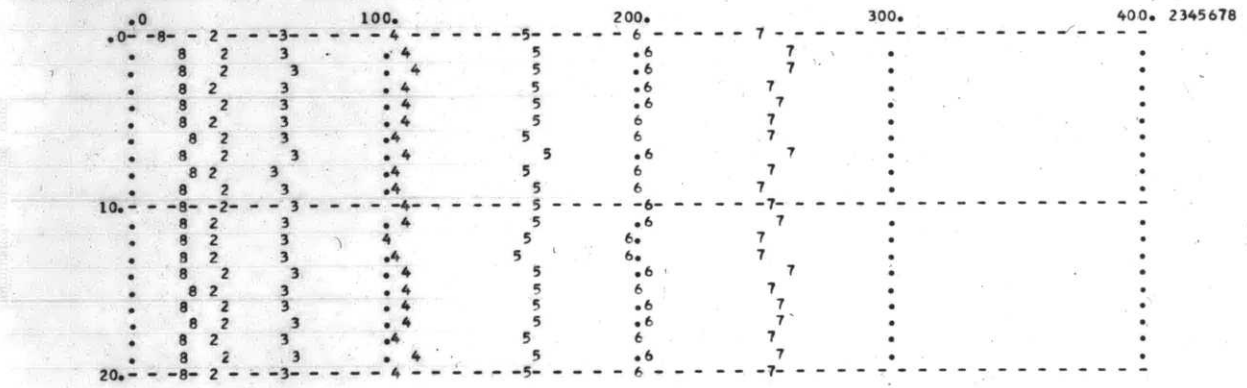
PAGE 42 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

LO1=1,LO2=2,LO3=3,LO4=4,LO5=5,LO6=6,LO7=7,LO8=8



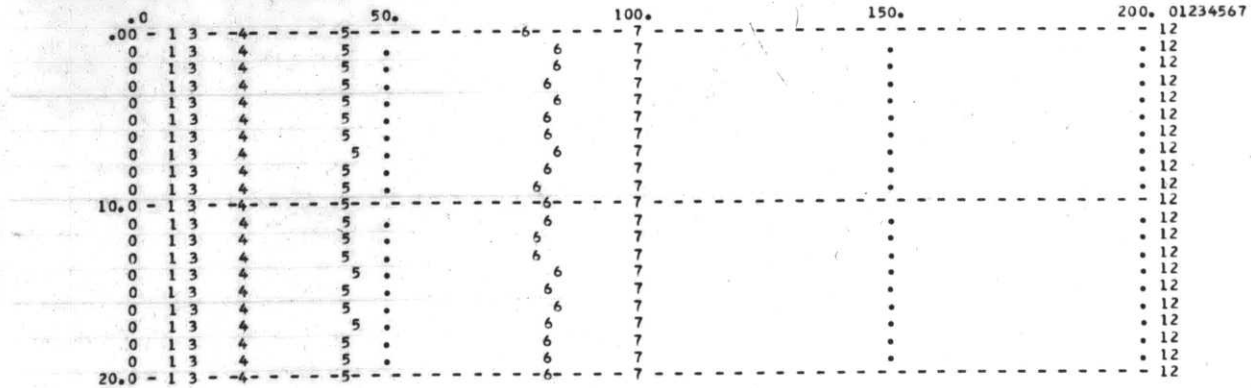
PAGE 43 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

PROM2=2,PROM3=3,PROM4=4,PROM5=5,PROM6=6,PROM7=7,PROM8=8



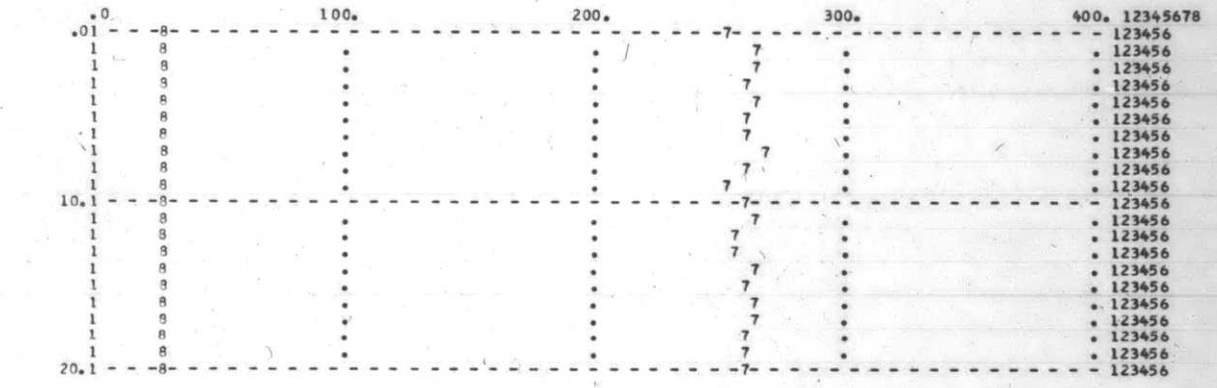
PAGE 44 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

PER1P=0,PER2P=1,PER3P=2,PER4P=3,PER5P=4,PER6P=5,PER7P=6,PER8P=7



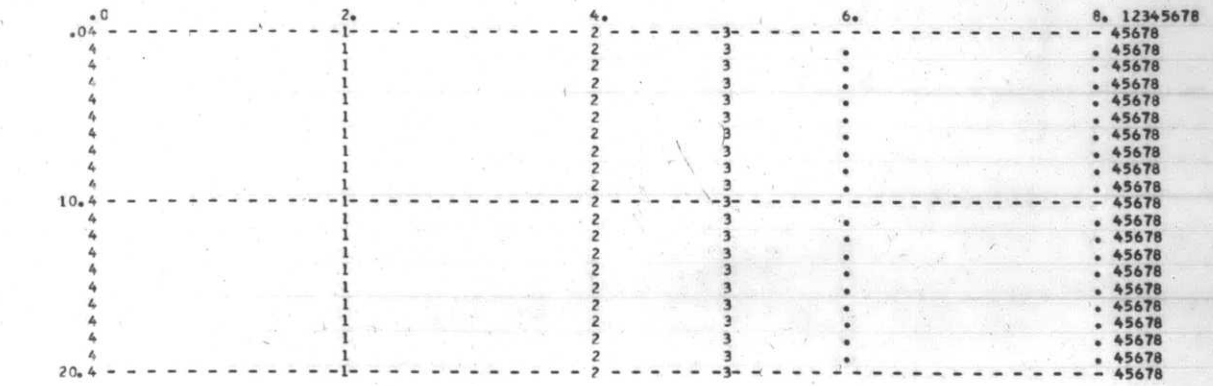
PAGE 45 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

NH1=1,NH2=2,NH3=3,NH4=4,NH5=5,NH6=6,NH7=7,NH8=8



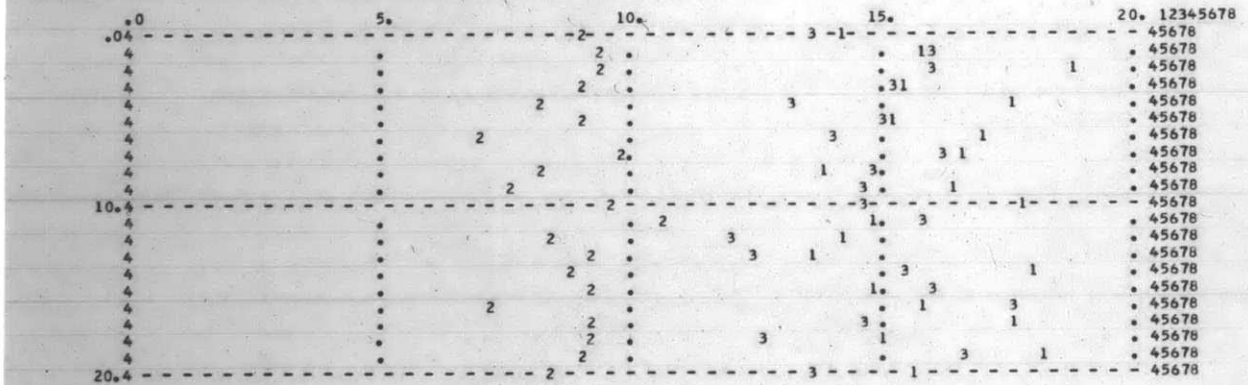
PAGE 46 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

LE1=1,LE2=2,LE3=3,LE4=4,LE5=5,LE6=6,LE7=7,LE8=8



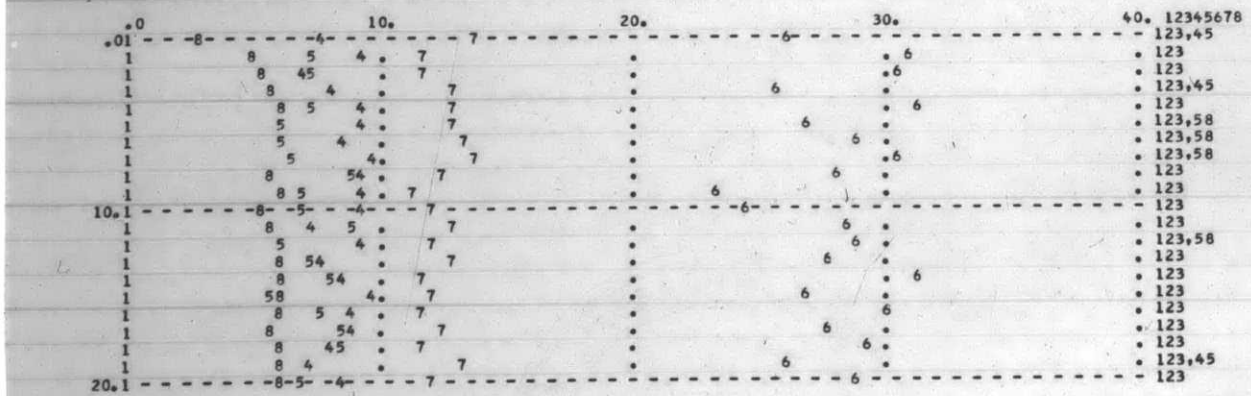
PAGE 47 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET1=1,RET2=2,RET3=3,RET4=4,RET5=5,RET6=6,RET7=7,RET8=8



PAGE 48 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

R1=1,R2=2,R3=3,R4=4,R5=5,R6=6,R7=7,R8=8



PAGE 49 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

SO1=1,SO2=2,SO3=3,SO4=4,SO5=5,SO6=6,SO7=7,SO8=8

```
    .0                  20.                       40.                       60.                       80. 12345678
   .0-8- - - - - - - - 7 - -1-2- 6 - - - - - - -53 - - -4 - - - - - - - - - - - - - - - - - - - - - - - -
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
   10.-8- - - - - - - -7- - -1-2- 6 - - - - - - -53 - - 4 - - - - - - - - - - - - - - - - - - - - - - - -
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
      .8               7    1 2  6               53   .  4                    .                         .
   20.-8- - - - - - - -7- - -1-2- 6 - - - - - - -53 - - 4 - - - - - - - - - - - - - - - - - - - - - - - -
```

PAGE 50 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET1=R,R1=X,PROM1=P,NH1=N,LE1=L,SO1=S,LO1=1,DL1=D

```
      .0                  200.                      400.                      600.                      800. RXPNLS1D
     .0X RS- - - - - - - - - - - - - - - - - - - - - -1- - - - - - - - - - - - - - - - - - - - - - - - - XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
    10.X RS- - - - - - - - - - - - - - - - - - - - - -1- - - - - - - - - - - - - - - - - - - - - - - - - XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
       X RS                 .                        .1                        .                        . XPNL,1D
    20.X RS- - - - - - - - - - - - - - - - - - - - - -1- - - - - - - - - - - - - - - - - - - - - - - - - XPNL,1D
```

PAGE 51 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET2=R,R2=X,PROM2=P,NH2=N,LE2=L,SO2=S,LO2=2,DL2=D

```
   .0                200.              400.              600.              800. RXPNLS2D
  .0XR-SP - - - - - - - - - - - - - - - - 2 - - - - - - - - - - - - - - - - - - - - XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR S P               .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
  10.XR-S-P- - - - - - - - - - - - - - - - 2 - - - - - - - - - - - - - - - - - - - - XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR S P               .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR SP                .                 .                 .                 . XN,RL,2D
    XR S P               .                 .                 .                 . XN,RL,2D
  20.XR-SP - - - - - - - - - - - - - - - - 2 - - - - - - - - - - - - - - - - - - - - XN,RL,2D
```

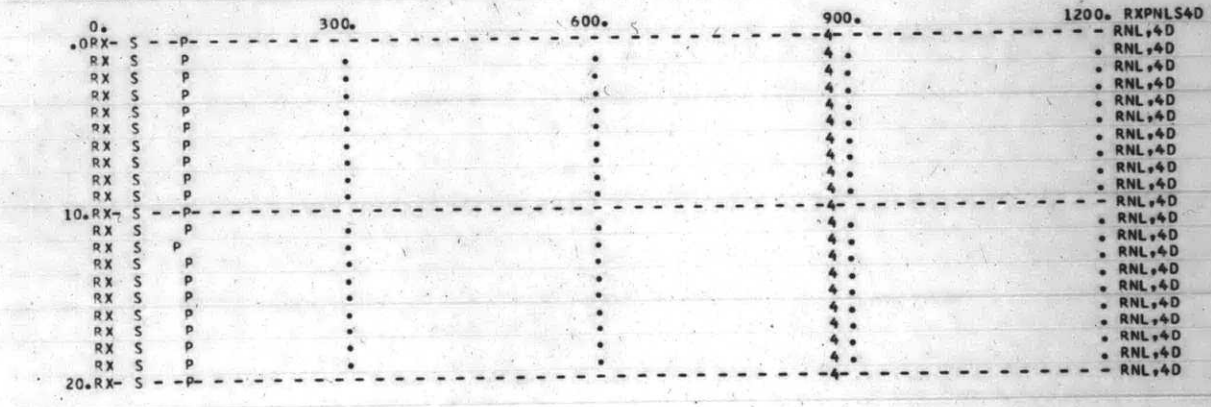
PAGE 52 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET3=R,R3=X,PROM3=P,NH3=N,LE3=L,SO3=S,LO3=3,DL3=D

```
   .0                200.              400.              600.              800. RXPNLS3D
  .0XLR -S-P- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 3 - - - - XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
  10.XLR -S- P - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 3 - - - - XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S P             .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
    XLR  S  P            .                 .                 .                 3 . XN,3D
  20.XLR -S-P- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 3 - - - - XN,3D
```

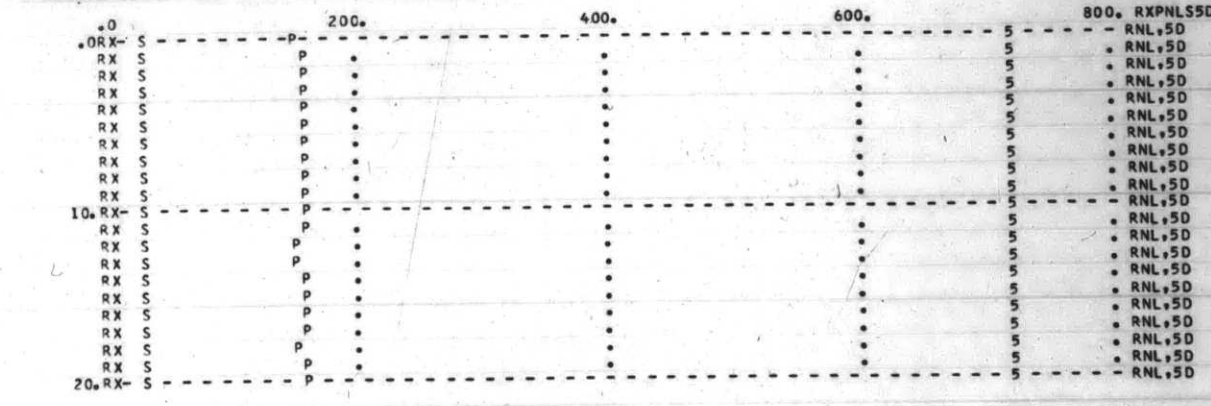
PAGE 53 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET4=R,R4=X,PROM4=P,NH4=N,LE4=L,SC4=S,LC4=4,DL4=D



PAGE 54 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET5=R,R5=X,PROM5=P,NH5=N,LE5=L,SC5=S,LC5=5,DL5=D



```
PAGE 55          6/23/72   BOTTOM FIVE PERCENT SELECTED OUT

RET6=R,R6=X,PROM6=P,NH6=N,LE6=L,SO6=S,LO6=6,DL6=D

      .0                   200.                     400.                     600.                      800. RXPNLS6D
    .0R -X- - - - - - - - - -P- - - - - - - - - - - - - - - - 6 - - - - - - - - - - - - - - - - - - - - - RNL,XS,6D
       R  SX                .P                       .          6            .                          . RNL,6D
       R  SX                .P                       .          6            .                          . RNL,6D
       R  X                  P                       .          6            .                          . RNL,XS,6D
       R  SX                 P                       .          6            .                          . RNL,6D
       R  X                  P                       .          6            .                          . RNL,XS,6D
       R  SX                 P                       .          6            .                          . RNL,6D
       R  SX                .P                       .          6            .                          . RNL,6D
       R  SX                 P                       .          6            .                          . RNL,6D
       R  X                  P                       .          6            .                          . RNL,XS,6D
    10.R -X- - - - - - - - - - P - - - - - - - - - - - - - - - 6 - - - - - - - - - - - - - - - - - - - - - RNL,XS,6D
       R  SX                .P                       .          6            .                          . RNL,6D
       R  SX                 P                       .          6            .                          . RNL,6D
       R  X                  P                       .          6            .                          . RNL,XS,6D
       R  SX                .P                       .          6            .                          . RNL,6D
       R  X                  P                       .          6            .                          . RNL,XS,6D
       R  SX                 P                       .          6            .                          . RNL,6D
       R  X                 .P                       .          6            .                          . RNL,XS,6D
       R  SX                 P                       .          6            .                          . RNL,6D
       R  X                 .P                       .          6            .                          . RNL,XS,6D
    20.R -SX - - - - - - - - -P- - - - - - - - - - - - - - - - 6 - - - - - - - - - - - - - - - - - - - - - RNL,6D

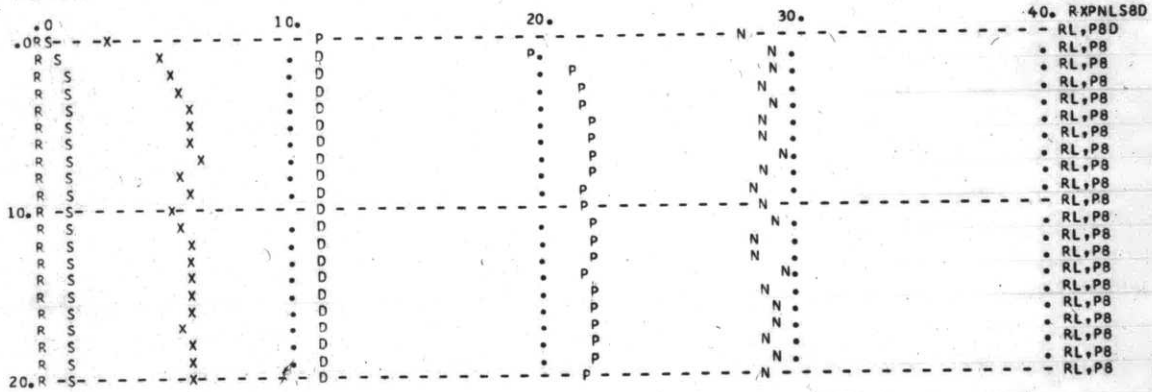

PAGE 56          6/23/72   BOTTOM FIVE PERCENT SELECTED OUT

RET7=R,R7=X,PROM7=P,NH7=N,LE7=L,SC7=S,LO7=7,DL7=D

      .0                   100.                     200.                     300.                      400. RXPNLS7D
    .0R -XS - - - - - - - - - - - - - - - - - - - - - - - - - PN- - - - - - - 7 - - - - - - - - - - - - RL,7D
       R  XS                 .                        .             PN         .  7 D                    . RL
       R  XS                 .                        .             PN         .  7 D                    . RL
       R  XS                 .                        .           P N          .  7 D                    . RL
       R  XS                 .                        .            P N         .  7 D                    . RL
       R  XS                 .                        .           P N          .  7 D                    . RL
       R  XS                 .                        .           P N          . 7  D                    . RL
       R  XS                 .                        .             P N        .  7 D                    . RL
       R  XS                 .                        .           P N          . 7  D                    . RL
       R  XS                 .                        .          PN            .  7 D                    . RL
    10.R -XS - - - - - - - - - - - - - - - - - - - - - - - - -P-N- - - - - - - 7 D - - - - - - - - - - - RL
       R  XS                 .                        .            P N         .  7 D                    . RL
       R  XS                 .                        .          P N           .  7 D                    . RL
       R  XS                 .                        .          P N           .  7 D                    . RL
       R  XS                 .                        .             PN         .  7 D                    . RL
       R  XS                 .                        .           P N          . 7  D                    . RL
       R  XS                 .                        .            P N         .  7 D                    . RL
       R  XS                 .                        .            P N         . 7  D                    . RL
       R  XS                 .                        .           P N          .  7 D                    . RL
       R  XS                 .                        .            PN          .  7 D                    . RL
    20.R -XS - - - - - - - - - - - - - - - - - - - - - - - - -P-N- - - - - - - 7 D - - - - - - - - - - - RL
```

PAGE 57 6/23/72 BOTTOM FIVE PERCENT SELECTED OUT

RET8=R,R8=X,PROM8=P,NH8=N,LE8=L,SC8=S,LO8=E,DL8=D



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```
C     SOX2=0
C     SOX3=0
RUN   NO SELECTION OUT

          SOX2     SOX3
PRESENT     0.       0.
ORIGINAL    0.    1.000
```

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TIME	DL	LO	PROM	PERP	NH	LE	RET	R	SO
TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00	E+00
	E+00	E+00							
.0	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	9.	0.	0.
	731.	731.	17.	2.	0.	5.	14.	0.	0.
	871.	871.	26.	3.	0.	0.	0.	8.	0.
	720.	720.	34.	5.	0.	0.	0.	7.	0.
	477.	477.	41.	9.	0.	0.	0.	26.	0.
	321.	321.	67.	21.	75.	0.	0.	14.	0.
	11.	11.	6.	50.	8.	0.	0.	3.	0.
	3966.	3966.							
1.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	9.	0.	0.
	731.	731.	19.	3.	0.	5.	16.	0.	0.
	871.	871.	30.	3.	0.	0.	0.	9.	0.
	720.	720.	40.	6.	0.	0.	0.	7.	0.
	477.	477.	47.	10.	0.	0.	0.	31.	0.
	321.	321.	78.	24.	83.	0.	0.	12.	0.
	11.	11.	6.	59.	9.	0.	0.	3.	0.
	3966.	3966.							
2.	404.	404.	0.	0.	0.	2.	19.	0.	0.
	431.	431.	17.	4.	0.	4.	9.	0.	0.
	731.	731.	22.	3.	0.	5.	16.	0.	0.
	871.	871.	33.	4.	0.	0.	0.	7.	0.
	720.	720.	40.	6.	0.	0.	0.	7.	0.
	477.	477.	47.	10.	0.	0.	0.	30.	0.
	321.	321.	77.	24.	83.	0.	0.	12.	0.
	11.	11.	6.	59.	9.	0.	0.	3.	0.
	3966.	3966.							

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
3.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	3.	0.	5.	15.	0.	0.
	871.	871.	29.	3.	0.	0.	0.	8.	0.
	720.	720.	37.	5.	0.	0.	0.	8.	0.
	477.	477.	45.	9.	0.	0.	0.	26.	0.
	321.	321.	70.	22.	78.	0.	0.	13.	0.
	11.	11.	6.	52.	9.	0.	0.	3.	0.
	3966.	3966.							
4.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	8.	0.	0.
	731.	731.	20.	3.	0.	5.	13.	0.	0.
	871.	871.	28.	3.	0.	0.	0.	9.	0.
	720.	720.	37.	5.	0.	0.	0.	7.	0.
	477.	477.	45.	9.	0.	0.	0.	31.	0.
	321.	321.	76.	24.	83.	0.	0.	13.	0.
	11.	11.	6.	57.	9.	0.	0.	3.	0.
	3966.	3966.							
5.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	2.	0.	5.	15.	0.	0.
	871.	871.	28.	3.	0.	0.	0.	9.	0.
	720.	720.	37.	5.	0.	0.	0.	6.	0.
	477.	477.	43.	9.	0.	0.	0.	27.	0.
	321.	321.	70.	22.	78.	0.	0.	13.	0.
	11.	11.	6.	52.	9.	0.	0.	3.	0.
	3966.	3966.							
6.	404.	404.	0.	0.	0.	2.	17.	0.	0.
	431.	431.	15.	3.	0.	4.	7.	0.	0.
	731.	731.	18.	2.	0.	5.	14.	0.	0.
	871.	871.	27.	3.	0.	0.	0.	8.	0.
	720.	720.	35.	5.	0.	0.	0.	6.	0.
	477.	477.	41.	9.	0.	0.	0.	29.	0.
	321.	321.	70.	22.	78.	0.	0.	14.	0.
	11.	11.	6.	52.	9.	0.	0.	3.	0.
	3966.	3966.							

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TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
7.	404.	404.	0.	0.	0.	2.	17.	0.	0.
	431.	431.	15.	3.	0.	4.	10.	0.	0.
	731.	731.	20.	3.	0.	5.	16.	0.	0.
	871.	871.	32.	4.	0.	0.	0.	9.	0.
	720.	720.	41.	6.	0.	0.	0.	7.	0.
	477.	477.	48.	10.	0.	0.	0.	30.	0.
	321.	321.	78.	24.	86.	0.	0.	14.	0.
	11.	11.	6.	59.	10.	0.	0.	3.	0.
	3966.	3966.							
8.	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	8.	0.	0.
	731.	731.	16.	2.	0.	5.	15.	0.	0.
	871.	871.	26.	3.	0.	0.	0.	9.	0.
	720.	720.	35.	5.	0.	0.	0.	9.	0.
	477.	477.	44.	9.	0.	0.	0.	28.	0.
	321.	321.	72.	22.	79.	0.	0.	13.	0.
	11.	11.	6.	54.	9.	0.	0.	3.	0.
	3966.	3966.							
9.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	8.	0.	0.
	731.	731.	18.	2.	0.	5.	15.	0.	0.
	871.	871.	28.	3.	0.	0.	0.	9.	0.
	720.	720.	37.	5.	0.	0.	0.	7.	0.
	477.	477.	44.	9.	0.	0.	0.	23.	0.
	321.	321.	67.	21.	73.	0.	0.	12.	0.
	11.	11.	5.	47.	8.	0.	0.	3.	0.
	3966.	3966.							
10.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	10.	0.	0.
	731.	731.	22.	3.	0.	5.	15.	0.	0.
	871.	871.	31.	4.	0.	0.	0.	9.	0.
	720.	720.	40.	6.	0.	0.	0.	7.	0.
	477.	477.	47.	10.	0.	0.	0.	24.	0.
	321.	321.	71.	22.	78.	0.	0.	12.	0.
	11.	11.	6.	54.	9.	0.	0.	3.	0.
	3966.	3966.							

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TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
11.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	11.	0.	0.
	731.	731.	19.	3.	0.	5.	16.	0.	0.
	871.	871.	30.	3.	0.	0.	0.	7.	0.
	720.	720.	38.	5.	0.	0.	0.	9.	0.
	477.	477.	46.	10.	0.	0.	0.	28.	0.
	321.	321.	75.	23.	82.	0.	0.	13.	0.
	11.	11.	6.	57.	9.	0.	0.	3.	0.
	3966.	3966.							
12.	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	8.	0.	0.
	731.	731.	17.	2.	0.	5.	12.	0.	0.
	871.	871.	24.	3.	0.	0.	0.	9.	0.
	720.	720.	33.	5.	0.	0.	0.	6.	0.
	477.	477.	39.	8.	0.	0.	0.	29.	0.
	321.	321.	68.	21.	75.	0.	0.	13.	0.
	11.	11.	5.	48.	8.	0.	0.	3.	0.
	3966.	3966.							
13.	404.	404.	0.	0.	0.	2.	14.	0.	0.
	431.	431.	12.	3.	0.	4.	9.	0.	0.
	731.	731.	17.	2.	0.	5.	12.	0.	0.
	871.	871.	24.	3.	0.	0.	0.	8.	0.
	720.	720.	32.	4.	0.	0.	0.	7.	0.
	477.	477.	39.	8.	0.	0.	0.	28.	0.
	321.	321.	67.	21.	75.	0.	0.	13.	0.
	11.	11.	5.	49.	8.	0.	0.	3.	0.
	3966.	3966.							
14.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	9.	0.	0.
	731.	731.	21.	3.	0.	5.	15.	0.	0.
	871.	871.	31.	4.	0.	0.	0.	8.	0.
	720.	720.	39.	5.	0.	0.	0.	8.	0.
	477.	477.	47.	10.	0.	0.	0.	31.	0.
	321.	321.	79.	25.	84.	0.	0.	12.	0.
	11.	11.	6.	57.	9.	0.	0.	3.	0.
	3966.	3966.							

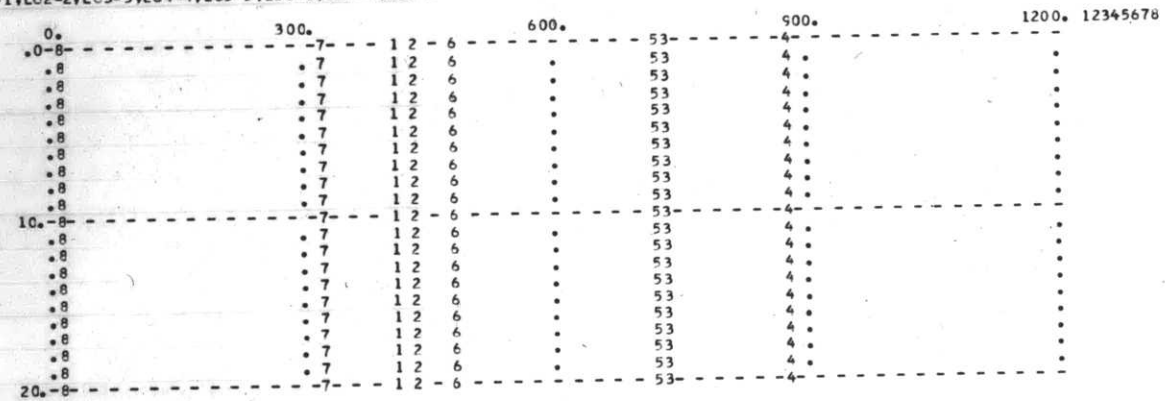
PAGE 63 6/23/72 NO SELECTION OUT

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
15.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	2.	0.	5.	16.	0.	0.
	871.	871.	29.	3.	0.	0.	0.	10.	0.
	720.	720.	39.	5.	0.	0.	0.	6.	0.
	477.	477.	44.	9.	0.	0.	0.	27.	0.
	321.	321.	71.	22.	78.	0.	0.	12.	0.
	11.	11.	6.	51.	9.	0.	0.	3.	0.
	3966.	3966.							
16.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	7.	0.	0.
	731.	731.	17.	2.	0.	5.	18.	0.	0.
	871.	871.	30.	3.	0.	0.	0.	9.	0.
	720.	720.	38.	5.	0.	0.	0.	8.	0.
	477.	477.	46.	10.	0.	0.	0.	30.	0.
	321.	321.	76.	24.	82.	0.	0.	12.	0.
	11.	11.	6.	56.	9.	0.	0.	3.	0.
	3966.	3966.							
17.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	9.	0.	0.
	731.	731.	21.	3.	0.	5.	15.	0.	0.
	871.	871.	31.	4.	0.	0.	0.	9.	0.
	720.	720.	39.	5.	0.	0.	0.	8.	0.
	477.	477.	48.	10.	0.	0.	0.	28.	0.
	321.	321.	75.	23.	82.	0.	0.	13.	0.
	11.	11.	6.	57.	9.	0.	0.	3.	0.
	3966.	3966.							
18.	404.	404.	0.	0.	0.	2.	15.	0.	0.
	431.	431.	13.	3.	0.	4.	9.	0.	0.
	731.	731.	18.	3.	0.	5.	13.	0.	0.
	871.	871.	26.	3.	0.	0.	0.	8.	0.
	720.	720.	34.	5.	0.	0.	0.	8.	0.
	477.	477.	42.	9.	0.	0.	0.	29.	0.
	321.	321.	71.	22.	78.	0.	0.	12.	0.
	11.	11.	6.	52.	9.	0.	0.	3.	0.
	3966.	3966.							

TIME	DL1	LO1	PROM1	PER1P	NH1	LE1	RET1	R1	SO1
	DL2	LO2	PROM2	PER2P	NH2	LE2	RET2	R2	SO2
	DL3	LO3	PROM3	PER3P	NH3	LE3	RET3	R3	SO3
	DL4	LO4	PROM4	PER4P	NH4	LE4	RET4	R4	SO4
	DL5	LO5	PROM5	PER5P	NH5	LE5	RET5	R5	SO5
	DL6	LO6	PROM6	PER6P	NH6	LE6	RET6	R6	SO6
	DL7	LO7	PROM7	PER7P	NH7	LE7	RET7	R7	SO7
	DL8	LO8	PROM8	PER8P	NH8	LE8	RET8	R8	SO8
	SUMDL	SUMLO							
19.	404.	404.	0.	0.	0.	2.	18.	0.	0.
	431.	431.	16.	4.	0.	4.	9.	0.	0.
	731.	731.	21.	3.	0.	5.	17.	0.	0.
	871.	871.	33.	4.	0.	0.	0.	7.	0.
	720.	720.	40.	6.	0.	0.	0.	7.	0.
	477.	477.	47.	10.	0.	0.	0.	26.	0.
	321.	321.	73.	23.	81.	0.	0.	13.	0.
	11.	11.	6.	55.	9.	0.	0.	3.	0.
	3966.	3966.							
20.	404.	404.	0.	0.	0.	2.	16.	0.	0.
	431.	431.	14.	3.	0.	4.	8.	0.	0.
	731.	731.	18.	2.	0.	5.	14.	0.	0.
	871.	871.	27.	3.	0.	0.	0.	8.	0.
	720.	720.	35.	5.	0.	0.	0.	7.	0.
	477.	477.	42.	9.	0.	0.	0.	29.	0.
	321.	321.	71.	22.	78.	0.	0.	12.	0.
	11.	11.	6.	51.	9.	0.	0.	3.	0.
	3966.	3966.							

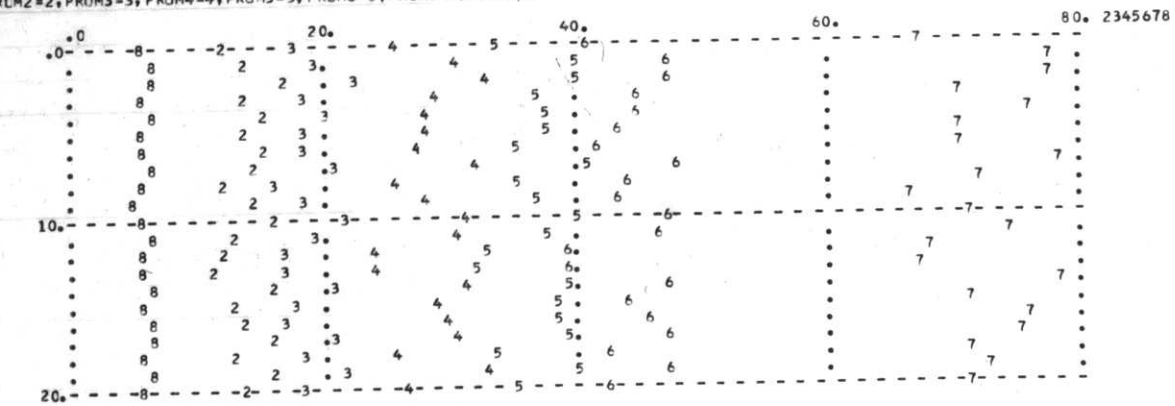
PAGE 65 6/23/72 NO SELECTION OUT

LO1=1,LO2=2,LO3=3,LO4=4,LO5=5,LO6=6,LO7=7,LO8=8



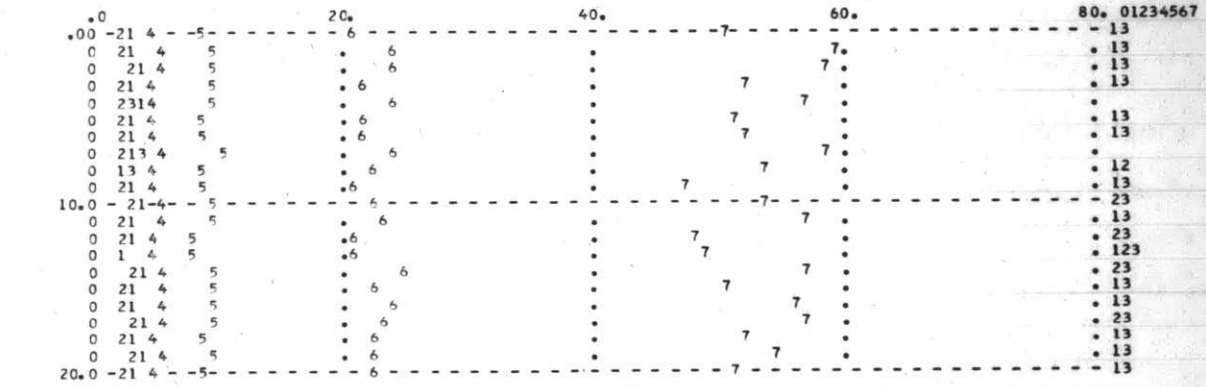
PAGE 66 6/23/72 NO SELECTION OUT

PROM2=2,PROM3=3,PROM4=4,PROM5=5,PROM6=6,PROM7=7,PROM8=8



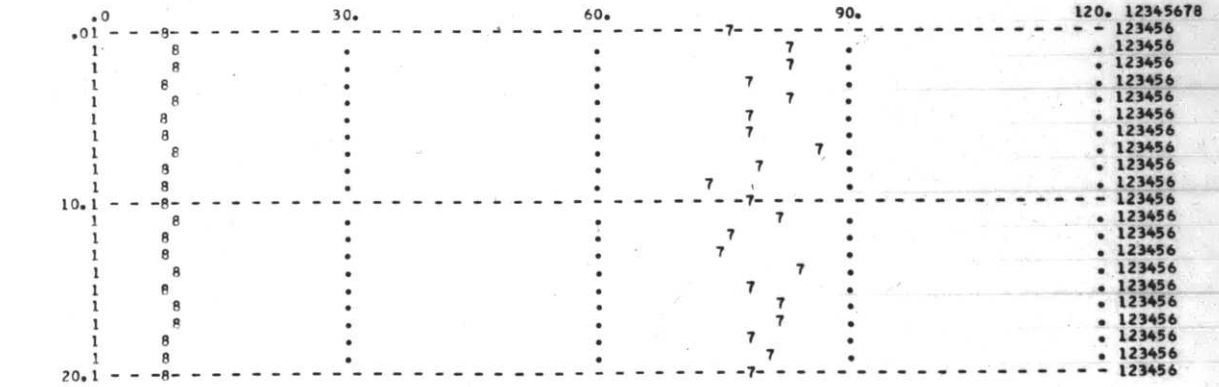
PAGE 67 6/23/72 NO SELECTION OUT

PER1P=0, PER2P=1, PER3P=2, PER4P=3, PER5P=4, PER6P=5, PER7P=6, PER8P=7



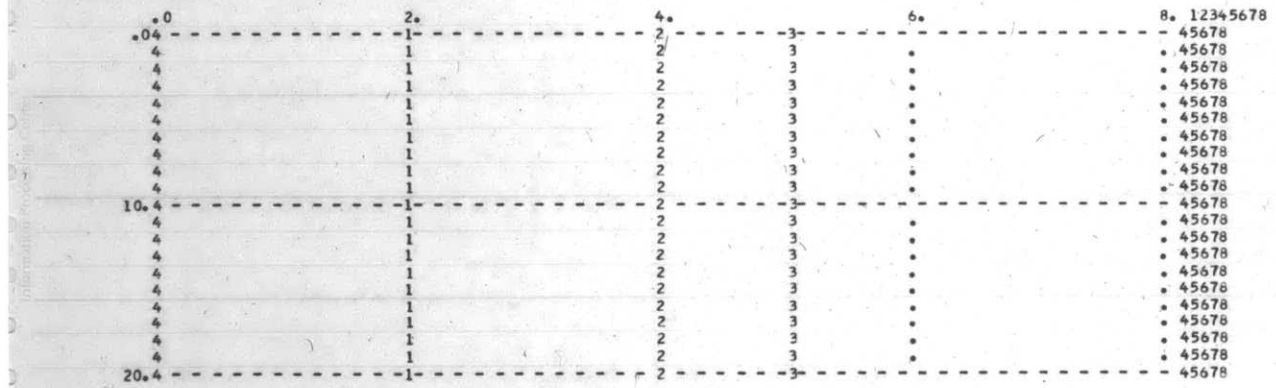
PAGE 68 6/23/72 NO SELECTION OUT

NH1=1, NH2=2, NH3=3, NH4=4, NH5=5, NH6=6, NH7=7, NH8=8



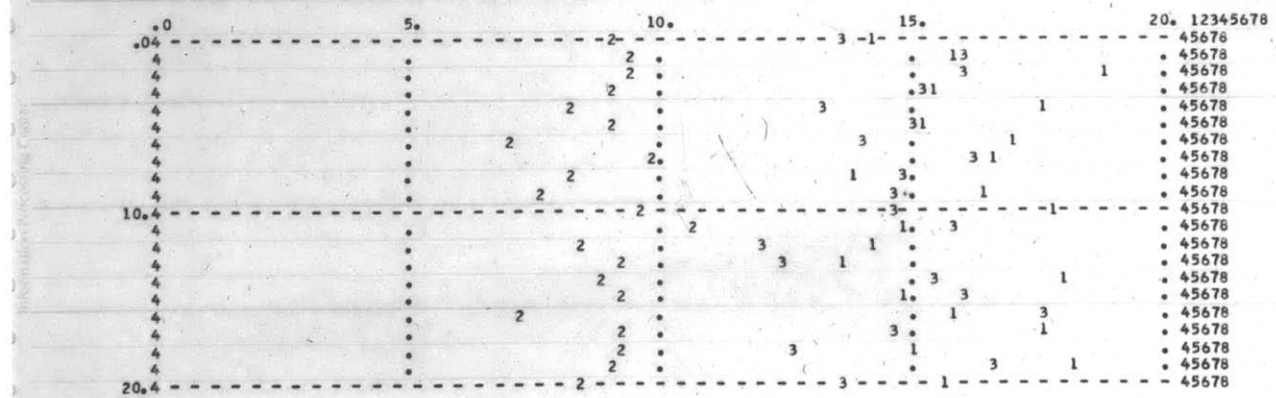
PAGE 69 6/23/72 NO SELECTION OUT

LE1=1,LE2=2,LE3=3,LE4=4,LE5=5,LE6=6,LE7=7,LE8=8



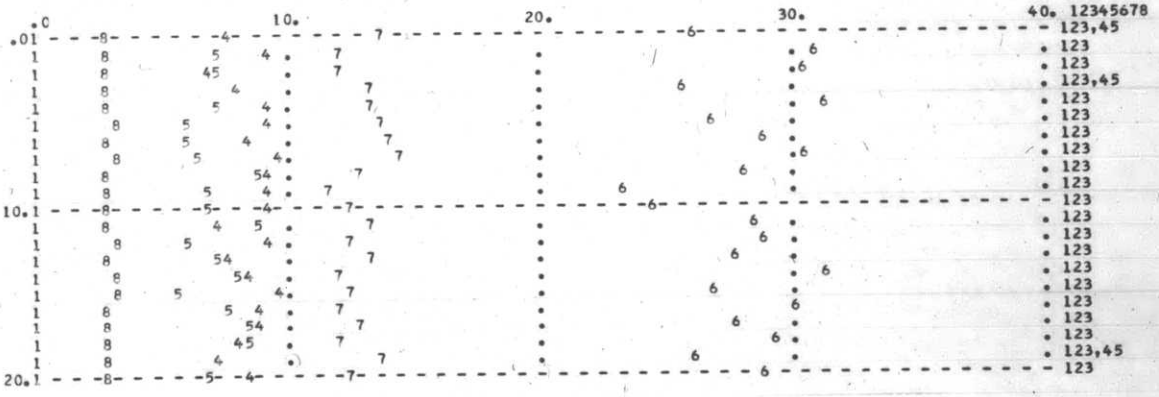
PAGE 70 6/23/72 NO SELECTION OUT

RET1=1,RET2=2,RET3=3,RET4=4,RET5=5,RET6=6,RET7=7,RET8=8



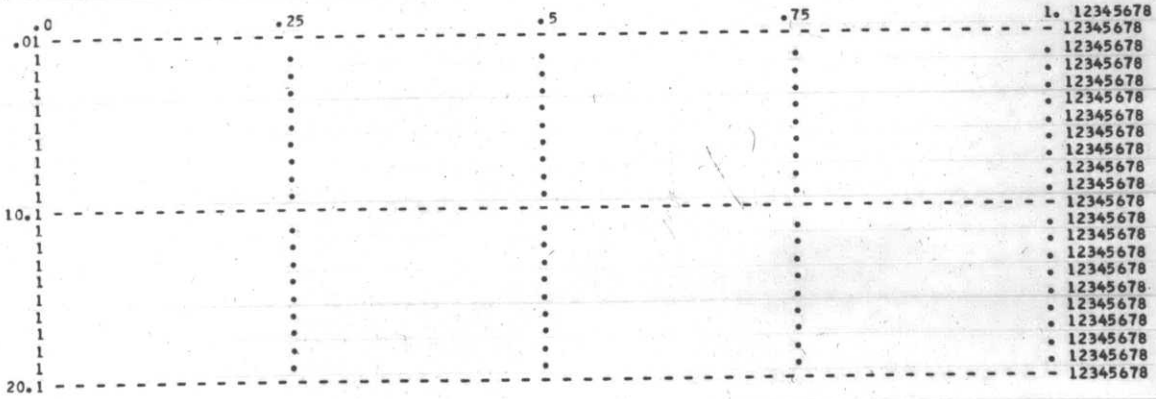
PAGE 71 6/23/72 NO SELECTION OUT

R1=1,R2=2,R3=3,R4=4,R5=5,R6=6,R7=7,R8=8



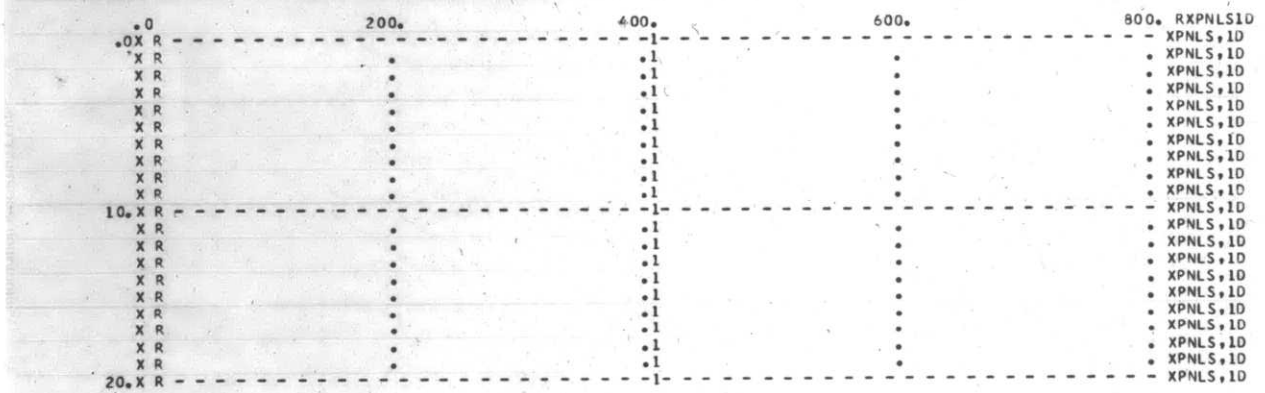
PAGE 72 6/23/72 NO SELECTION OUT

S01=1,S02=2,S03=3,S04=4,S05=5,S06=6,S07=7,S08=8



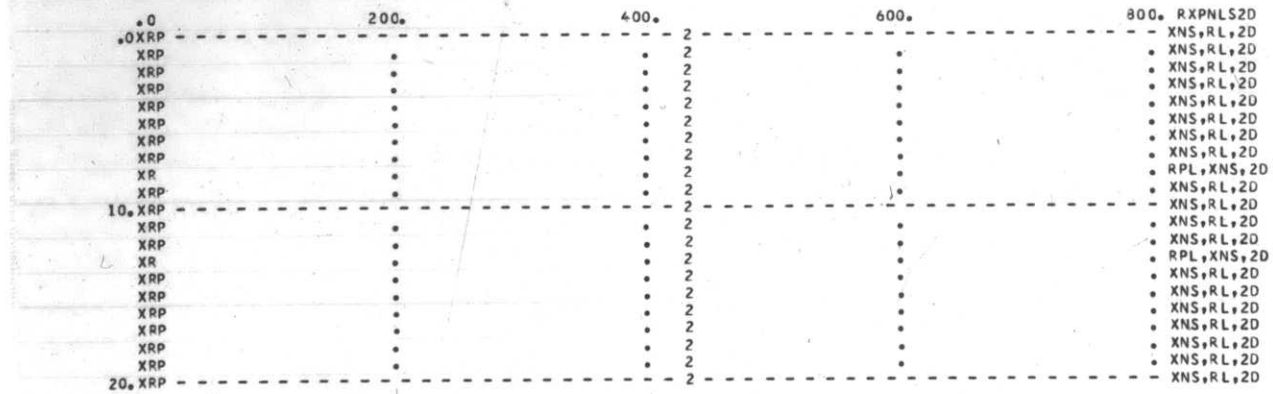
PAGE 73 6/23/72 NO SELECTION OUT

RET1=R,R1=X,PROM1=P,NH1=N,LE1=L,SO1=S,LO1=1,DL1=D



PAGE 74 6/23/72 NO SELECTION OUT

RET2=R,R2=X,PROM2=P,NH2=N,LE2=L,SO2=S,LO2=2,DL2=D



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PAGE 75             6/23/72    NO SELECTION OUT

RET3=R,R3=X,PRCM3=P,NH3=N,LE3=L,SC3=S,LC3=3,DL3=D

       .0                   200.                      400.                      600.                      800. RXPNLS3D
   .0XLP - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -3- - - - - RP,XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLPP                     .                         .                         .              3          . XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLP                      .                         .                         .              3          . RP,XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLRP                     .                         .                         .              3          . XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
  10.XLPP- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -3- - - - - XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLP                      .                         .                         .              3          . RP,XNS,3D
     XLP                      .                         .                         .              3          . RP,XNS,3D
     XLRP                     .                         .                         .              3          . XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLR                      .                         .                         .              3          . RP,XNS,3D
     XLRP                     .                         .                         .              3          . XNS,3D
     XLP                      .                         .                         .              3          . RP,XNS,3D
     XLPP                     .                         .                         .              3          . XNS,3D
  20.XLP - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -3- - - - - RP,XNS,3D

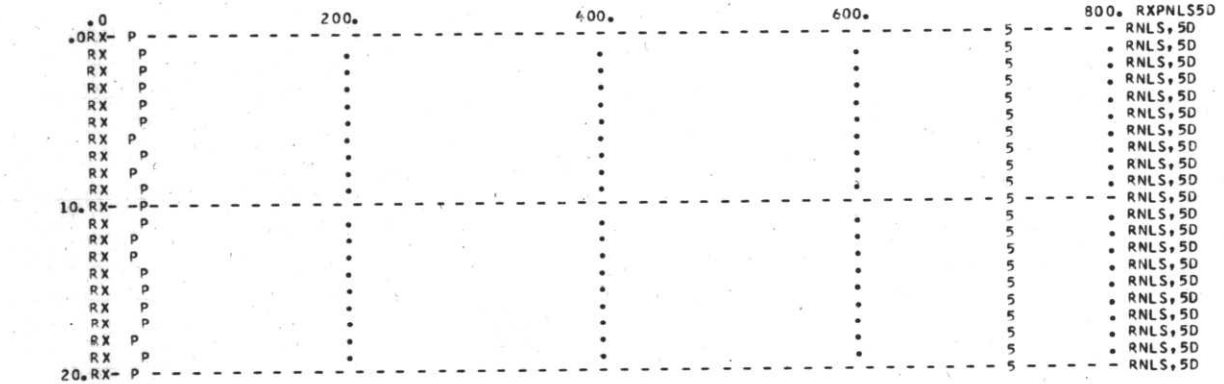

PACE 76             6/23/72    NO SELECTION OUT

RET4=R,R4=X,PROM4=P,NH4=N,LE4=L,SC4=S,LC4=4,DL4=D

       0.                   300.                      600.                      900.                      1200. RXPNLS4D
   .0RXP - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -4- - - - - - - - - - - - - - - - RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
  10.RX-P- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -4- - - - - - - - - - - - - - - - RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
     RXP                      .                         .                         4 .                       . RNLS,4D
     RX P                     .                         .                         4 .                       . RNLS,4D
  20.RXP - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -4- - - - - - - - - - - - - - - - RNLS,4D
```

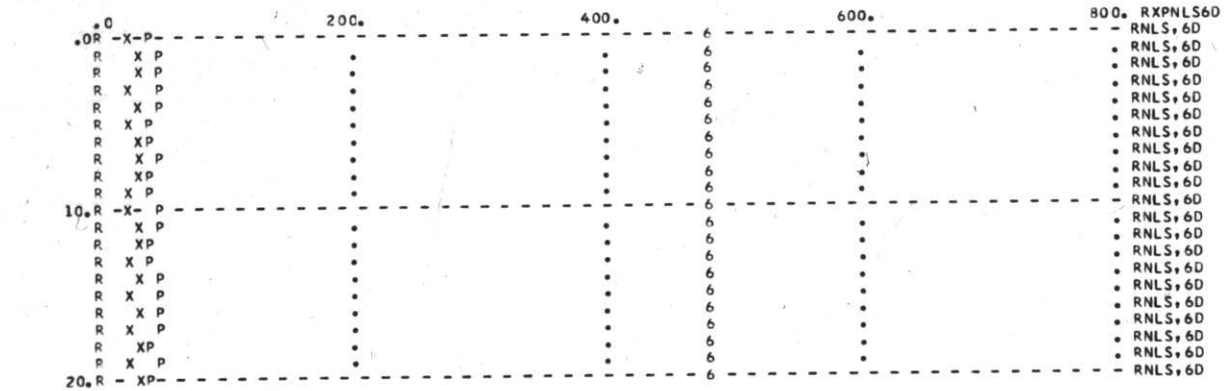
PAGE 77 6/23/72 NO SELECTION OUT

RET5=R,R5=X,PROM5=P,NH5=N,LE5=L,SC5=S,LO5=S,DL5=D



PAGE 78 6/23/72 NO SELECTION OUT

RET6=R,R6=X,PROM6=P,NH6=N,LE6=L,SC6=S,LO6=S,DL6=D



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PAGE 79          6/23/72    NO SELECTION OUT

RET7=R,R7=X,PROM7=P,NH7=N,LE7=L,SC7=S,LO7=7,DL7=D

  .0                     100.                     200.                      300.                     400. RXPNLS7D
.0R -X- - - - - - -P-N- - - - - - - - - - - - - - - - - - - - - - - - - - - - - -  7 - - - - - - - - - - RLS,7D
  R  X               P N   .                        .                         .    7                   . RLS,7D
  R  X               P N   .                        .                         .    7                   . RLS,7D
  R  X              PN     .                        .                         .    7                   . RLS,7D
  R  X               P N   .                        .                         .    7                   . RLS,7D
  R  X              P N    .                        .                         .    7                   . RLS,7D
  R  X              P N    .                        .                         .    7                   . RLS,7D
  R   X               PN   .                        .                         .    7                   . RLS,7D
  R  X              P N    .                        .                         .    7                   . RLS,7D
  R  X             PN      .                        .                         .    7                   . RLS,7D
10.R -X- - - - - - - PN- - - - - - - - - - - - - - - - - - - - - - - - - - - - -  7 - - - - - - - - - - RLS,7D
  R  X               PN    .                        .                         .    7                   . RLS,7D
  R  X             P N     .                        .                         .    7                   . RLS,7D
  R  X             P N     .                        .                         .    7                   . RLS,7D
  R  X                PN   .                        .                         .    7                   . RLS,7D
  R  X              PN     .                        .                         .    7                   . RLS,7D
  R  X               PN    .                        .                         .    7                   . RLS,7D
  R  X               PN    .                        .                         .    7                   . RLS,7D
  R  X              PN     .                        .                         .    7                   . RLS,7D
  R  X              P N    .                        .                         .    7                   . RLS,7D
20.R -X- - - - - - - PN- - - - - - - - - - - - - - - - - - - - - - - - - - - - -  7 - - - - - - - - - - RLS,7D


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RET8=R,R8=X,PROM8=P,NH8=N,LE8=L,SC8=S,LO8=8,DL8=D

  .0                       5.                      10.                       15.                      20. RXPNLS8D
.0R - - - - - - X - - - - - - P - - - - - - N - - - - - - -8- - - - - - - - - - - - - - - - - - - - - - RLS,8D
  R             X          .      P             N   .     8                   .                        . RLS,8D
  R             X          .      P             N   .     8                   .                        . RLS,8D
  R             X          .   P             N      .     8                   .                        . RLS,8D
  R              X         .     P              N   .     8                   .                        . RLS,8D
  R              X         .  P              N      .     8                   .                        . RLS,8D
  R              X         .   P             N      .     8                   .                        . RLS,8D
  R               X        .      P               N .     8                   .                        . RLS,8D
  R             X          .    P             N     .     8                   .                        . RLS,8D
  R              X         .P              N        .     8                   .                        . RLS,8D
10.R - - - - - -X- - - - - - - P - - - - - -N- - - - - - -8- - - - - - - - - - - - - - - - - - - - - - RLS,8D
  R             X          .     P             N    .     8                   .                        . RLS,8D
  R              X         .P               N       .     8                   .                        . RLS,8D
  R              X         . P              N       .     8                   .                        . RLS,8D
  R              X         .     P               N  .     8                   .                        . RLS,8D
  R              X         .  P              N      .     8                   .                        . RLS,8D
  R              X         .     P             N    .     8                   .                        . RLS,8D
  R             X          .     P             N    .     8                   .                        . RLS,8D
  R              X         .  P              N      .     8                   .                        . RLS,8D
  R              X         .    P              N    .     8                   .                        . RLS,8D
20.R - - - - - - -X- - - - - - P - - - - - - N- - - - - - -8- - - - - - - - - - - - - - - - - - - - - - RLS,8D
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APPENDIX II

INSTRUCTION TO USER

THE UNITED STATES FOREIGN SERVICE:

A PERSONNEL MODEL

The model is based on the Systems Dynamics simulation method. Systems Dynamics had its origin as Industrial Dynamics in work done at the Massachusetts Institute of Technology by J. W. Forrester and his coworkers. The language used in Industrial Dynamics is DYNAMO.

The model is a simulation of part of the Foreign Service dealing with Foreign Service Officers only. It does not handle problems concerning functional skills or other personnel systems of the Department of State.

Unlike many simulation models, it has no hidden assumptions which are known only to its creator. The mathematical equations simply add or subtract from a rank based on the information you furnish and in a manner chosen by you. There is a basic program which has been chosen by the originator of the model. His assumptions are printed on the forms for you to see. They will remain in the model and be used unless you choose to change them in the following columns. This will be made clearer as you read each section.

The model will allow you to test various policies in recruiting, lateral entry, promotion, retirement, resignation, and selection-out. If you were to try all of the various combinations possible, you will have run over 36,000 different programs. Needless to say, we can only get you started with a basic combination. After you become familiar with the sys-

tem, you can then expand to a more esoteric Foreign Service.

One very important benefit of simulation is the ability to change only one variable while holding the others constant. We suggest that you approach this model the same way. For example, you could change the number of employees selected-out each year to see how it would affect promotion rates. While doing this, you would hold all of the other variables constant. In real life, you would expect resignations to be changed by your actions but by holding them constant, you would then be in a better position to use the results in a later run to predict the actual effect on resignation.

One final warning must be given. This is a simulation. It can only reflect the real system to the extent your input is accurate. Furthermore, you are estimating future events and then allowing the machine to combine your estimates. Remember that it is not a magic box, but rather a large calculator that does no more than handle your biases in a rapid manner. The impressive looking results are merely neat, orderly summaries of those biases over a period of time. The model will inform you where your policies will lead you, not necessarily where they should lead you. With this dreary warning, go on to the instructions.

Instructions

Read through each of the sectors. It may seem difficult at first, but you will be thoroughly in charge after one try. If it remains too complicated, please contact personnel for assistance.

RETIREMENT SECTOR

You are offered three approaches to retirement. You may state a specific number of retirees from each rank each year (check RETX1), a specific percentage of each rank each year (check RETX2), or make an estimated per cent per rank each year, giving a mean and a standard deviation (check RETX3).

Game:	Is now:	Your choice:	Depending on choice, you must fill in:
RETX1	_____	_____	RET I
RETX2	_____	_____	RET II
RETX3	X	_____	RET III and IV

RET I	Is now:	Your choice: (Write the number to be retired)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	100	_____	_____	_____	_____	RT1=
FSO-2	80	_____	_____	_____	_____	RT2=
FSO-3	100	_____	_____	_____	_____	RT3=
FSO-4	0	_____	_____	_____	_____	RT4=
FSO-5	0	_____	_____	_____	_____	RT5=
FSO-6	0	_____	_____	_____	_____	RT6=
FSO-7	0	_____	_____	_____	_____	RT7=
FSO-8	0	_____	_____	_____	_____	RT8=

RET II	Is now:	Your choice: (Write percentage in decimal form)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0.04	____	____	____	____	RTPC1=
FSO-2	0.02	____	____	____	____	RTPC2=
FSO-3	0.02	____	____	____	____	RTPC3=
FSO-4	0	____	____	____	____	RTPC4=
FSO-5	0	____	____	____	____	RTPC5=
FSO-6	0	____	____	____	____	RTPC6=
FSO-7	0	____	____	____	____	RTPC7=
FSO-8	0	____	____	____	____	RTPC8=

RET III	Is now:	Your choice: (Write estimated percentage in decimal form)				
FSO-1	0.04	____	____	____	____	RTMN1=
FSO-2	0.02	____	____	____	____	RTMN2=
FSO-3	0.02	____	____	____	____	RTMN3=
FSO-4	0	____	____	____	____	RTMN4=
FSO-5	0	____	____	____	____	RTMN5=
FSO-6	0	____	____	____	____	RTMN6=
FSO-7	0	____	____	____	____	RTMN7=
FSO-8	0	____	____	____	____	RTMN8=

RET IV	Is now:	Your choice: (Write standard deviation on normal distribution based on the mean you estimated in RET III, above)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0.003	_____	_____	_____	_____	RTDV1=
FSO-2	0.002	_____	_____	_____	_____	RTDV2=
FSO-3	0.002	_____	_____	_____	_____	RTDV3=
FSO-4	0	_____	_____	_____	_____	RTDV4=
FSO-5	0	_____	_____	_____	_____	RTDV5=
FSO-6	0	_____	_____	_____	_____	RTDV6=
FSO-7	0	_____	_____	_____	_____	RTDV7=
FSO-8	0	_____	_____	_____	_____	RTDV8=

RESIGNATION SECTOR

You are offered three approaches to resignation. You may state a specific number of resignations expected from each rank each year (check RX1), a percentage of each rank each year (check RX2), or make an estimated per cent per rank each year, giving a mean and a standard deviation (check RX3).

Game:	Is now:	Your choice:	Depending on choice, you must fill in:
RX1	_____	_____	RES I
RX2	_____	_____	RES II
RX3	X	_____	RES III and IV

RES I	Is now:	Your choice: (Write number that will resign)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0	_____	_____	_____	_____	RN1=
FSO-2	0	_____	_____	_____	_____	RN2=
FSO-3	5	_____	_____	_____	_____	RN3=
FSO-4	0	_____	_____	_____	_____	RN4=
FSO-5	25	_____	_____	_____	_____	RN5=
FSO-6	25	_____	_____	_____	_____	RN6=
FSO-7	10	_____	_____	_____	_____	RN7=
FSO-8	5	_____	_____	_____	_____	RN8=

RES II	Is now:	Your choice: (Write percentage in decimal form)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0					RPC1=
FSO-2	0					RPC2=
FSO-3	0					RPC3=
FSO-4	0.01					RPC4=
FSO-5	0.01					RPC5=
FSO-6	0.06					RPC6=
FSO-7	0.04					RPC7=
FSO-8	0.27					RPC8=
RES III	Is now:	Your choice: (Write estimated percentage in decimal form)				
FSO-1	0					RMN1=
FSO-2	0					RMN2=
FSO-3	0					RMN3=
FSO-4	0.01					RMN4=
FSO-5	0.01					RMN5=
FSO-6	0.06					RMN6=
FSO-7	0.04					RMN7=
FSO-8	0.27					RMN8=

RES IV	Is now:	Your choice: (Write standard deviation on normal distribution based on the mean you estimated in RES III, above)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0					RDEV1=
FSO-2	0					RDEV2=
FSO-3	0					RDEV3=
FSO-4	0.001					RDEV4=
FSO-5	0.001					RDEV5=
FSO-6	0.005					RDEV6=
FSO-7	0.025					RDEV7=
FSO-8	0.015					RDEV8=

SELECTION-OUT SECTOR

You are offered five choices of policies in selection-out. You must put a check mark before the one you choose to use.

Game:	Is now:	Your choice:	
SOX1	_____	_____	If you wish to note a number per class. (Fill in SO I)
SOX2	_____	_____	State a specific per cent per class. (Fill in SO II)
SOX3	X	_____	State an estimated per cent as in the previous sectors. (You must fill in a mean and a standard deviation in SO III and SO IV, respectively)
SOX4	_____	_____	This will give you SOX1 or SOX2, whichever is smaller. (Fill in SO I and II)
SOX5	_____	_____	This will give you SOX1 or SOX2, whichever is larger. (Fill in SO I and II)

SO I	Is now:	Your choice: (Write a number per class)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0					SOP1=
FSO-2	0					SOP2=
FSO-3	0					SOP3=
FSO-4	20					SOP4=
FSO-5	0					SOP5=
FSO-6	40					SOP6=
FSO-7	0					SOP7=
FSO-8	0					SOP8=
SO II	Is now:	Your choice: (Write percentage in decimal form)				
FSO-1	0.05					SOPC1=
FSO-2	0.05					SOPC2=
FSO-3	0.05					SOPC3=
FSO-4	0.05					SOPC4=
FSO-5	0.05					SOPC5=
FSO-6	0.05					SOPC6=
FSO-7	0.05					SOPC7=
FSO-8	0.05					SOPC8=

SO III	Is now:	Your choice: (Write percentage in decimal form)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0					SMN1=
FSO-2	0					SMN2=
FSO-3	0.2					SMN3=
FSO-4	0					SMN4=
FSO-5	0					SMN5=
FSO-6	0.2					SMN6=
FSO-7	0					SMN7=
FSO-8	0					SMN8=
SO IV	Is now:	Your choice: (Write percentage in decimal form)				
FSO-1	0					SDEV1=
FSO-2	0					SDEV2=
FSO-3	0.025					SDEV3=
FSO-4	0					SDEV4=
FSO-5	0					SDEV5=
FSO-6	0.025					SDEV6=
FSO-7	0					SDEV7=
FSO-8	0					SDEV8=

PROMOTION SECTOR

You are offered ten policies in the promotion sector.

Game:	Is now:	Your choice:	
PX1	_____	_____	When you wish to promote a number for each class each year. (Fill in P I)
PX2	_____	_____	State a per cent per class per year. (Fill in P II)
PX3	_____	_____	This option will distribute the promotions over a table which limits the number promoted to a budgetary control. This is too complicated for most users. If you wish to use this option, it must be done with an authorized person from personnel.
PX4	X	_____	The model contains an option which will promote as many officers from each class as there are positions open above. The number is bounded by the number of officers available to be promoted and zero. This option will fill vacancies as fast as possible, modified only by a delay which is explained in the note below. This option is recommended to those who wish to vary retirement, resignations, selection-out, etc. to see how it would change the promotion rates.
PX5	_____	_____	For the lesser of PX1 and PX2.
PX6	_____	_____	For the lesser of PX2 and PX3.
PX7	_____	_____	For the lesser of PX1 and PX4.
PX8	_____	_____	For the greater of PX2 and PX3.
PX9	_____	_____	For the greater of PX1 and PX4.
PX10	_____	_____	For the greater of PX2 and PX4.

Special Note: All of the above promotion rates can be spread over more than one year. To do this, you merely state how many years you wish to have the adjustment take place for each rank. Do this below:

	Is now:	Your choice: Run 1	Run 2	Run 3	Run 4	Keypunch Code
FSO-2	1					PROD2=
FSO-3	1					PROD3=
FSO-4	1					PROD4=
FSO-5	1					PROD5=
FSO-6	1					PROD6=
FSO-7	1					PROD7=
FSO-8	1					PROD8=

P I	Is now:	Your choice: (Write number for each class)				
FSO-2	5					PN2=
FSO-3	20					PN3=
FSO-4	40					PN4=
FSO-5	60					PN5=
FSO-6	60					PN6=
FSO-7	40					PN7=
FSO-8	10					PN8=

P II	Is now:	Your choice: (Write percentage in decimal form)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-2	0.1					PPC2=
FSO-3	0.1					PPC3=
FSO-4	0.1					PPC4=
FSO-5	0.1					PPC5=
FSO-6	0.1					PPC6=
FSO-7	0.1					PPC7=
FSO-8	0.1					PPC8=

P III	Is now:	Your choice: (Write a percentage in decimal form)				
FSO-2	0.1					PPCB2=
FSO-3	0.1					PPCB3=
FSO-4	0.1					PPCB4=
FSO-5	0.1					PPCB5=
FSO-6	0.1					PPCB6=
FSO-7	0.1					PPCB7=
FSO-8	0.1					PPCB8=

NEW HIRE SECTOR

You are offered eleven policies in this sector.

Game:	Is now:	Your choice:	
NHX1	_____	_____	This will be used when you wish to hire a specific number each year.
NHX2	_____	_____	Use this if you wish to hire a percentage of each class each year. (Fill in NH I)
NHX3	_____	_____	Use this option if you wish to replace, through new hires, only the number leaving each year. They will be distributed through the ranks by the percentage given in NH III.
NHX4	_____	_____	This will give you the lesser of games NHX1 and NHX3. (Fill in NH I and III)
NHX5	_____	_____	For the lesser of NHX2 and NHX3. (Fill in NH II and III)
NHX6	_____	_____	For the greater of NHX1 and NHX3. (Fill in NH I and III)
NHX7	_____	_____	For the greater of NHX2 and NHX3. (Fill in NH II and III)
NHX8	_____	_____	This will fill in the vacant FSO-8 slots only. This is to be used solely for severe attrition.
NHX9	_____	_____	This option will fill total vacancies each year less those hired by lateral entry. The total vacancies can be reduced by a percentage of attrition. This is discussed below. The number hired under this option will be assigned to the ranks by the percentages given by you in NH III.
NHX10	X	_____	Greater of NHX3 and NHX9. (Fill in NH II and III)
NHX11	_____	_____	Lesser of NHX3 and NHX9. (Fill in NH II and III)

Special Note: If you choose to reduce the Foreign Service through attrition, as offered in games NHX9, NHX10, and NHX11, you must give the percentage you wish to hire in the space noted below as NHZ. For example, if you are faced with a 5 per cent attrition rate, NHZ should equal 0.95. If you use any of these options and do not have an attrition rate, you must make NHZ equal to 1.0. The basic model does not consider attrition, so if you wish to change it, state the rate you intend to use below.

NHZ is now 1.0, your choice is _____ Keypunch Code NHZ=

The model offers you the ability to place new hires at any rank. Current legislation forbids this, but the option remains to allow you to test new options. The use of lateral entry for ranks FSO-1 through FSO-6 is provided for in the lateral entry sector.

NH I	Is now:	Your choice: (Write a specific number per rank)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0					NHN1=
FSO-2	0					NHN2=
FSO-3	0					NHN3=
FSO-4	0					NHN4=
FSO-5	0					NHN5=
FSO-6	0					NHN6=
FSO-7	80					NHN7=
FSO-8	20					NHN8=

NH II	Is now:	Your choice: (Write a percentage in decimal form. It must total 100 per cent for all ranks)				
FSO-1	0					NHPC1=
FSO-2	0					NHPC2=
FSO-3	0					NHPC3=
FSO-4	0					NHPC4=
FSO-5	0					NHPC5=
FSO-6	0					NHPC6=
FSO-7	0.9					NHPC7=
FSO-8	0.1					NHPC8=

NH III	Is now:	Your choice: (Write a percentage in decimal form. It must total 100 per cent for all ranks)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	0					NHPO1=
FSO-2	0					NHPO2=
FSO-3	0					NHPO3=
FSO-4	0					NHPO4=
FSO-5	0					NHPO5=
FSO-6	0					NHPO6=
FSO-7	0.9					NHPO7=
FSO-8	0.1					NHPO8=

LATERAL ENTRY SECTOR

There are four options offered in this sector.

Game:	Is now:	Your choice:	
LEX1	X		Check this if you wish to appoint a certain number to each rank each year. (Fill in LE I)
LEX2			Check this if you wish to appoint a per cent per class to each rank each year. (Fill in LE II)
LEX3			For the lesser of LEX1 and LEX2. (Fill in LE I and II)
LEX4			For the greater of LEX1 and LEX2. (Fill in LE I and II)

LE I	Is now:	Your choice: (Write a number for each rank)				Keypunch Code
		Run 1	Run 2	Run 3	Run 4	
FSO-1	2					LEN1=
FSO-2	4					LEN2=
FSO-3	5					LEN3=
FSO-4	0					LEN4=
FSO-5	0					LEN5=
FSO-6	0					LEN6=

LE I (cont.)

		Run 1	Run 2	Run 3	Run 4	Keypunch Code
FSO-7	0					LEN7=
FSO-8	0					LEN8=

LE II	Is now:	Your choice: (Write percentage in decimal form)				
FSO-1	0.1					LEPC1=
FSO-2	0.2					LEPC2=
FSO-3	0.3					LEPC3=
FSO-4	0					LEPC4=
FSO-5	0					LEPC5=
FSO-6	0					LEPC6=
FSO-7	0					LEPC7=
FSO-8	0					LEPC8=

BASIC STATISTICS

Before you can run your model, some basic information must be supplied. You must supply the number of positions in each rank (desired level), and the number of officers in each rank (actual level). For those using the budget option offered in the promotion sector, an additional constant must be defined; this constant is called "budget." Before you use this option, consult with the appropriate authority in personnel.

Rank:	Number of positions (desired level)			Number of officers (actual level)		
	Is now:	Your choice:	Keypunch Code:	Is now:	Your choice:	Keypunch Code
FSO-1	404		DL1=	404		LO1=
FSO-2	431		DL2=	432		LO2=
FSO-3	731		DL3=	731		LO3=
FSO-4	871		DL4=	871		LO4=
FSO-5	720		DL5=	720		LO5=
FSO-6	477		DL6=	321		LO6=
FSO-7	321		DL7=	321		LO7=
FSO-8	11		DL8=	11		LO8=

Budget 10,000,000 Your choice _____

PRINTED RESULTS

We suggest that you use all of the printed out-put on your first use of this model. After that, you should save time and paper by selecting only those charts that you are interested in.

TIME: The model will print and chart 20 years. Please write the number of years you wish. (It should be less than 20, but you may go higher.)

Time _____ Keypunch Code LENGTH=____

Check if you wish printed: (See next page for code)

Column:

1	Level of each rank (LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8)	____
2	Desired level (DL1, DL2, DL3, DL4, DL5, DL6, DL7, DL8)	____
3	Promotions from class (PROM1,...PROM8)	____
4	Per cent of class promoted (PER1P,...PER8P)	____
5	New hires in each class (NH1,...NH8)	____
6	Lateral entry in each class (LE1,...LE8)	____
7	Retirees from each class (RET1,...RET8)	____
8	Number resigning from each class (R1,...R8)	____
9	Number selected-out from each class (SO1,...SO8)	____

Check if you wish plotted:

_____ Level of each class

_____ Number promoted from each class

_____ Number entering each class through lateral entry

_____ Number resigning from each class

_____ Per cent of each class promoted

_____ New hires in each class

_____ Number retiring from each class

_____ Number selected-out from each class

The above is broken down by sector (i.e., retirement, promotion, etc.). You may also order the plotting done by rank. Each rank will show the sector results for that rank only. Check the ranks desired:

FSO-1___, FSO-2___, FSO-3___, FSO-4___, FSO-5___, FSO-6___, FSO-7___, FSO-8___

The coding shown on the print-out is:

DL1 = Desired level of O-1 officers

PROM1 = Number of O-1 officers promoted

NH1 = Number of new hires into O-1 rank

RET1 = Number of O-1 officers retiring

R1 = Number of O-1 officers resigning

LO1 = Actual level of O-1 officers

PER1P = Per cent of O-1 officers promoted

LE1 = Number of officers entering O-1 rank through lateral entry

SO1 = Number of O-1 officers selected-out

LABELS

You may have noticed that you have been offered four runs. By just changing a few of the figures, you may test varying levels of a policy or different policies. You may title each run to distinguish them. Your title will appear at the top of each page of print-out. The first run title is "With 06 and 03 threshold selection-out." Your titles should not exceed 50 letters.

Run	Title
Basic	With 06 and 03 threshold selection-out
1	
2	
3	
4	

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