3-1997

Simulation Model of Fighter Pilot Assignment Process

Anthony J. Hutfles

Follow this and additional works at: https://scholar.afit.edu/etd

Part of the Aviation Commons, and the Operational Research Commons

SIMULATION MODEL OF FIGHTER PILOT
ASSIGNMENT PROCESS

THESIS

Anthony J. Hutfles, Major, USAF

AFIT/GOA/ENS/97M-10

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

19970429 233

SIMULATION MODEL OF FIGHTER PILOT ASSIGNMENT PROCESS

THESIS

Anthony J. Hutfles, Major, USAF

AFIT/GOA/ENS/97M-10

SIMULATION MODEL OF FIGHTER PILOT

ASSIGNMENT PROCESS

THESIS

Presented to the Faculty of the Graduate School of Engineering

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science Operations Analysis

Anthony J. Hutfles, B.S.

Major, USAF

March 1997

Approved for public release; distribution unlimited

THESIS APPROVAL

STUDENT: Major Anthony J. Hutfles   CLASS: GOA-97M

THESIS TITLE: Simulation Model of Fighter Pilot Assignment Process

DEFENSE DATE: 26 February 1997

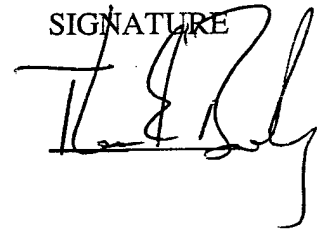| COMMITTEE	NAME/TITLE/DEPARTMENT	SIGNATURE
Advisor	Thomas G. Bailey, Lieutenant Colonel, USAF Assistant Professor of Operations Research Department of Operational Sciences Air Force Institute of Technology	
Reader	William P. Murdock, Jr., Major, USAF Assistant Professor of Operations Research Department of Operational Sciences Air Force Institute of Technology	

Acknowledgments

This Thesis would have never been completed without the help and guidance of many people. My thanks to Lt Col Bailey and Maj Murdock for the guidance and direction that ensured I stayed on the proper course. Without the help Maj Garton and the rest of the staff at AFPC Analysis office, this entire project could not have been accomplished. Their quick and timely responses to my inquires allowed me to move forward at a steady and consistent pace. Also an acknowledge to all of the late night revelers in modeling and simulation room, 133B, who commiserated with me on many a late nights.

Anthony J. Hutfles

Table of Contents

List of Figures

List of Tables

List of Equations

Abstract

This thesis analyzes the effect Continental United States (CONUS) Time on Station (TOS) has on filling critical rated assignments. A SIMSCRIPT II.5 simulation model of the F15 and F16 pilots assignment process was developed. The simulation tested the effect of changing CONUS TOS from 3 years to 6 years in half year increments. Analysis of the number of unfilled rated assignments from simulation runs of 10 years in length indicated that changing CONUS TOS by itself has no statistically significant effect on model's output. The analysis was expanded to a 2^2 factorial experimental design using CONUS TOS and Total Active Rated Service (TARS) as independent variables, and unfilled assignments and pilots unassigned as the responses. Second-order effects present in the response surfaces then necessitated expanding the original design to fully determine the effect of CONUS TOS and TARS on the Air Force's ability to minimize the number of unfilled assignments and number of pilots without assignments. The final results indicate that CONUS TOS has no effect on filling critical rated assignments while retention has a major effect.

SIMULATION MODEL OF FIGHTER PILOT ASSIGNMENT PROCESS

I. Background

General Issue

As the 20th Century comes to an end, the United States military is in the process of lowering manpower levels. The breakup of the Soviet Union and the rising United States budget deficit have led to cuts in the military budget. As a result, the armed services have to make cost saving decisions, including downsizing the force sizes. Although force sizes have been reduced, the missions of the armed services have remained constant. Since all of the services must now do more with less resources, it is critical for the United States Air Force to efficiently manage its personnel resources.

In 1995, Air Force Personnel Center (AFPC) developed a SIMSCRIPT II.5 simulation model to analyze support personnel career fields. The initial purpose of this model was to find a method for filling critical overseas assignments in a manner which did not cause a short notice Permanent Change of Station (PCS). Simulation runs showed that using a Time on Station (TOS) of 3 years would allow for a smooth transition of personnel and ensure these critical assignments were filled. (Garton, 22 August 96.)

In the above SIMSCRIPT II.5 model, assignments are worked for one career field at a time. The model would age the career field with promotions, separations, and gains. TOS and "must move" rules determined assignment openings; then, the simulation would fill the assignment with personnel of the proper rank if possible. The nature of rated assignments would not allow a straightforward use of the support model, since pilots are

not interchangeable. For example, at the operational level a F-16 pilot slot must be filled by a F-16 qualified pilot. A B-52 or C-130 pilot, while capable of learning to fly a F-16, requires months of training to become mission ready in the F-16. In another example, staff assignments may depend upon the aircraft experience of the pilot. Typically, a staff slot may specifically require either a F-16 pilot or any fighter pilot background. In addition, there are staff assignments which require any rated personnel, pilot or navigator. These aspects of the rated force assignments make the current support model inappropriate for the rated force.

Problem Statement

Given the rated force structure, critical rated assignments, authorized experience levels for operational units and length of tour for remote and overseas assignments, the problem is to minimize the number of unfilled critical rated assignments. The rated force structure consists of the size of the rated force and individual member data. Critical rated assignments have a priority, flight status, and location information.

Minimizing the number of unfilled critical rated assignments will be accomplished by the choice of continental United States (CONUS) assignment TOS rules subject to assignment priority; assignment requirements; operational units experience; overseas return date; and, undergraduate pilot training (UPT) graduation rate.

Methodology and Scope

The methodology used to minimize unfilled critical rated assignments is output analysis, where a SIMSCRIPT II.5 model determines the response to the input factors. The scope will be limited to the F-15 and F-16 fighter pilot community.

Research Objectives

The objective of this research to determine a policy for time on station for F-15 and F-16 pilots that minimizes the number of unfilled critical rated assignments.

Summary

As force downsizing continues, efficient resource management is critical for the United States Air Force. Rated personnel are a key resource, but AFPC currently has accomplished no analytical work on rated force CONUS TOS rules. This research aims to develop a simulation model to analyze the effect of CONUS TOS rules on the Air Force's ability to fill critical rated assignments.

II. Literature Review

Manpower Models

Manpower models are designed to solve multiple types of problems. Examples of these problems include analyzing proposed changes and testing the rationale of current policies (Grinold and Marshall, 1977: xiii). The U.S. military has developed manpower models on many aspects of military manpower. These include Air Force pilot pipeline (Knight, 1978), B-52 radar navigator shortages (Charpie, 1987) and Army downsizing (Durso and Donahue, 1995).

Military Manpower Model

Network flow models have been used by the U.S. Army and U.S. Air Force to analyze personnel policies. The U.S. Army used a network flow model to study the different methods of downsizing their enlisted force (Durso and Donahue, 1995:111-112). The model construction consists of nodes containing soldiers of same grade and years of service, and arcs representing different career path-- promotion, stay in the same rank, and separation. A flexible model, with slight modifications it can analyze the effects of operations other than war and the impact of changing U.S. Army Reserve requirements on U.S. Army manning (Durso and Donahue, 1995:120-126).

In 1987 Charpie developed a network flow model to analyze the result of policy changes on B-52 radar navigators career filed (Charpie, 1987). The construction of the model was similar to the one used by Durso and Donahue. Nodes represented the

different types of assignments and arcs represented movement between assignments. Unable to accurately model time in service and aviation service time, his network flow model gave training rates that were too low when compared to real world. A simulation was developed to extract this data for use in the network model (Charpie, 1987:43).

Another network flow model was developed by Olson to maximize the attainment of flying gates by Air Force rated personnel (Olson, 1987). Each node in the network was defined by four criteria-- time period being examined, individual duty assignment, aviation service date year group, and flight gate time accumulated (Olson, 1987:27).

Both Charpie's and Olson's models are large network problems. Olson's model originally had 4,560 nodes; however the feasible combinations of duty type and individual data lowers the number of nodes to 975 (Olson, 1987: 45). Additionally, assignments aggregations (e.g., staff tours & AFIT) allowed Olson to use only 4 types of duties in describing his network nodes (Olson, 1987: 45). By contrast, an increase of a single assignment in Olson's model would introduce 1140 possible additional nodes. In both models the assignment characteristics are key. The problem of minimizing the number of unfilled critical rated assignments requires a higher degree of resolution than Olson's aggregation of assignments. Therefore, using network flow models to minimize the number of unfilled critical rated assignments requires an extremely large network analysis.

The following year, Jameson improved Olson's model by adding goal programming techniques to increase the model's flexibility to analyze different policies and conflicting goals (Jameson, 1988:23). Goal programming allows programming weights in the objective function that reflect different policies' values for meeting the

5

specific targets, therefore increasing a model's flexibility (Gass, 1991: 72). Specifically, critical rated assignments have different levels of priorities in being filled. Goal programming gives the decision maker the flexibility to determine if it is more valuable to fill all of the highest priority assignments and leave some of the next highest open, or leave one of the highest open and fill all of the next.

Knight developed a closed loop feedback system to analyze the U.S. Air Force pilot pipeline that uses nonlinear first order differential equations to determine UPT requirements (Knight, 1977:1-3). Since the model is deterministic in nature, using the same input variables always returns the same results, whereas a change of input variables represents different policies on pilot force structure. The model gives the capability to test the effects of these different policies on UPT instructor, UPT class size and instructor student ratios.

Summary

In the network flow models, some level of aggregation is required. Charpie, Olson, and Jameson aggregated individual duty assignments into types of assignments to reduce the number of network nodes. However aggregation of assignments gives too low of a fidelity to accurately model critical rated assignments, while not aggregating assignments results in an unmanageable number of nodes in a network flow design.

Jameson's incorporation of goal programming techniques expands Olson's model ability to analyze the effect of additional policies on maximizing the attainment of flying gates. By changing the cost of leaving certain priority levels open, Jameson is able to

model different policies for critical rated assignments. Goal programming techniques

allow a comparison of different policies' effects on the critical rated assignment process.

III. Methodology

Simulation

In operations research, one of the most popular and growing techniques for analysis is simulation (Law and Kelton, 1982:2). A simulation is an artificial representation of a real world process or system. From this artificial representation, an analyst draws conclusions about the characteristics of the real world process or system (Banks, Carson and Nelson, 1996:3).

Program Description

Appendix A contains the complete SIMSCRIPT II.5 code for the simulation. The SIMSCRIPT II.5 simulation consists of two basic entities, Pilot and Assignment. A pilot entity incorporates all of the pilot's personal data: rank, date of rank, years of service, assignment, assignment location, date arrived at assignment, PCS date, gate time, flight hours, and weapon system. Each active pilot resides in one of three sets: CONUS, OVERSEAS, and UNASSIGNED. An assignment entity consists of a name, location, pilot assigned; whether or not it is a flying billet; and, type of pilot required. Each assignment exists in one of two sets: FILLED and UNFILLED.

The simulation starts in 1997 and runs for ten years in three month increments. Inputs to the simulation consists of the initial F15/F16 pilot database and the CONUS length of tour. Overseas tour length has a constant value of three years. Consecutive Overseas Tours (COTs) are possible in the simulation. After each quarter, the program outputs the number of assignments filled and unfilled, number of consecutive overseas

8

tours, number of unassigned pilots, and F15/F16 experience levels. Fifteen routines make up the structure of the simulation (See Figure 1). The ROUTINE AGER drives the simulation. Each quarter, ROUTINE AGER calls upon routines to accomplish retention calculations, promotions to 1st lieutenant and captain, and assignments. Once a year, the ROUTINE AGER activates the promotion to major and lieutenant colonel routine. ROUTINE ASSIGN initiates the assignment process when called by ROUTINE AGER. The first step taken by ROUTINE ASSIGN determines who must PCS. Next, the ROUTINE ASSIGN adds Replacement Training Unit (RTU) graduates to the system. Individual routines represent the assignment process for the six different classes of assignments. The arrangement of these routine calls inside ROUTINE ASSIGN represent the priority of the different assignments. Each individual assignment routine sorts the eligible pilots based on its requirements listed below in Assumptions. After sorting, the first pilot fills the first available assignment. This process continues until either eligible pilots or available assignments are exhausted. Then the next assignment routine starts. Following the output of assignments statistics for the quarter, ROUTINE AGER schedules the next quarter's ROUTINE AGER.

Assumptions

No model can represent a system one hundred percent (Banks, Carson and Nelson, 1996:407). Since assumptions play a key role in ensuring an accurate representation of the system being modeled, all of the assumptions of the F15 and F16 assignment model have been approved by AFPC.
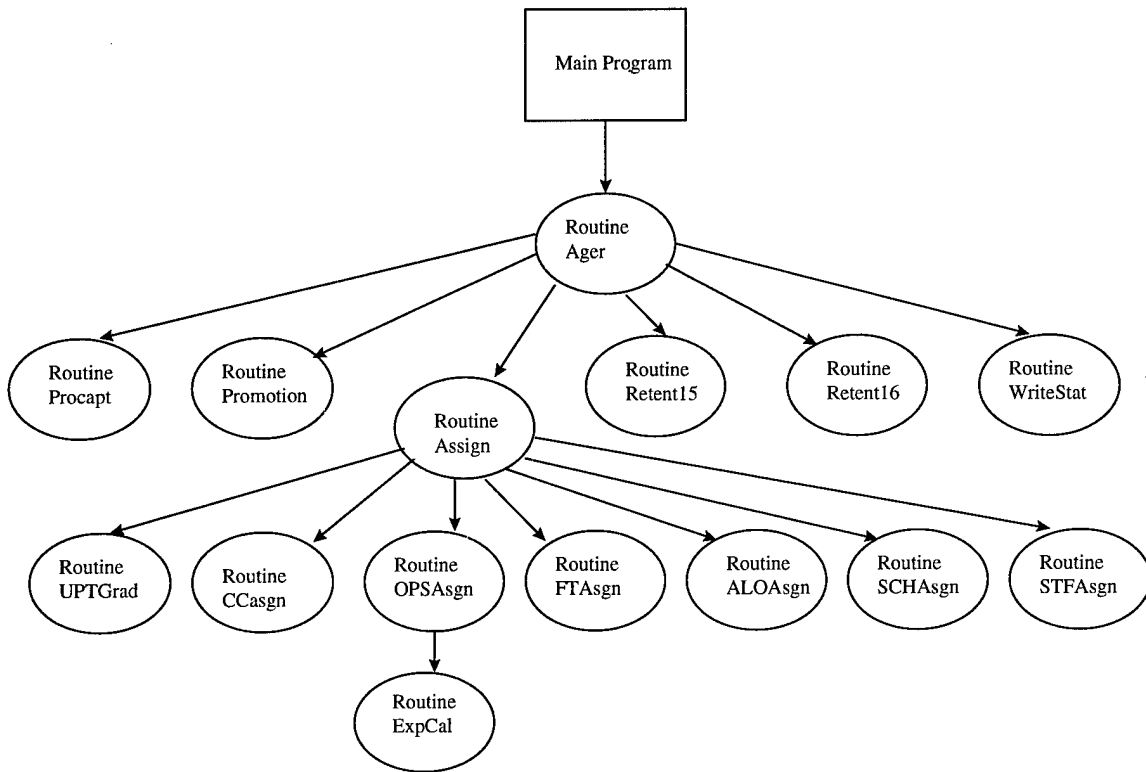
Figure 1: Simulation Structure

A critical set of assumptions for this model deal with the number, type, priority, and process of assignments. The initial number of assignments occupied by F15 and F16 pilots gives the total number and type of assignments for the entire simulation run. The priority of assignments from highest to lowest are Command Billets, Operational Flying Billets, Formal Training Instructor Pilots, Air Liaison Officer (ALO), School Slots, and Staff Assignments (Garton, 6 Dec 96).

Command Billets consists of squadron commanders and squadron operations officers. ROUTINE CCASGN accomplishes the command assignment process which selects a lieutenant colonel, who must PCS and has the proper weapon system, to fill the billet. The length of tour for all command billets runs for two years (Garton, 6 Dec 96).

Operational flying billets assignments occur in ROUTINE OPSASGN. Its assignment process sorts pilots to give priority to those with lowest gate time, lowest rank, and lowest years of service (Garton, 6 Dec 96). Graduates of RTUs receive operational flying assignments. If no operational flying billets are available for RTU graduates, ROUTINE UPTGRAD removes senior pilots with over 10 years of gate time to open the necessary number of billets (Garton, 3 Dec 96).

Formal Training billets require pilots who have at least 500 flight hours in their primary aircraft. ROUTINE FTASGN sorts pilot by number of previous formal training assignments, gate time, and grade. This sort gives assignment priority to those pilots without a previous formal training assignment, low gate time and low grade (Garton, 6 Dec 96).

ALO assignment process occurs in ROUTINE ALOASGN These assignments requirements consist of a captain or major currently assigned to an operational unit with between 8 and 12 years of gate time, and who have not been assigned to an ALO slot previously. The lower gate time pilots have priority for an ALO assignments (Garton, 6 Dec 96).

ROUTINE SCHASGN accomplishes school assignments. School slots consist of three types; Senior Service School (SSS), Intermediate Service School (ISS), and Air Force Institute of Technology (AFIT). SSS and ISS are one year in length; while grade requirements are lieutenant colonel and major, respectively. AFIT assignment length is one and half years, and accepts pilots with over 10 years of gate time (Garton, 6 Dec 96).

Staff Assignments process in ROUTINE STFASGN, looks for senior officers with over 10 years of gate time. The simulations sorts the eligible pilots by grade, then gate

time (Garton, 6 Dec 96). Three type of staff assignments exist: F15 pilot required, F16 pilot required, and Fighter pilot required. A fighter pilot staff billet initially filled by a F15 or F16 pilot prefers a F15 or F16 pilot over any other fighter pilot. These fighter pilot staff billets can be filled by either F15 or F16 pilots.

Promotions rates to 1st lieutenant, captain and major are 100% (Garton, 5 Nov 96). For lieutenant colonel promotions, a rate of 72.35% was derived from the average promotion for pilots for eight promotion boards from 1989 to 1996 (Headquarters Air Force Personnel Center, 1996:World Wide Web Site). One hundred percent promotion to major sounds unrealistic by itself; however, the retention rate removes pilots who have been twice passed over to major. Therefore, the retention rate, combined with removing all majors with over twenty years of service from the simulation, gives a realistic flow. The retention rate was averaged from retention rates from FY90 to FY95 for F15 and F16 pilots (Garton, 31 Oct 96). (See Table 1 for values).

The overall number of RTU graduates assigned to the F15 and F16 each year is 124 and 156 respectively (Garton, 17 Oct 96). Out of the 124 RTU graduates assigned to F15, 16 are First Assignment Instructor Pilots (FAIPs); i.e., pilots who were assigned as Instructor Pilots at UPT bases upon graduation form UPT. Thirty-two FAIPs enter the F16 yearly (Garton, 7 Jan 97). An additional 32 RTU graduates will have had a prior non-pilot assignment before entering UPT. The F15 career field receives 12 and F16 career field receives 20. These prior assigned graduates are split evenly between 5 or 6 years of service (Hegedisuch, 13 Jan 97).

Table 1 F15/F16 Retention Rates

Years of Service	F15	F16
4	0.9844	0.9858
5	0.9810	0.9935
6	0.9652	0.9779
7	0.9512	0.9601
8	0.8758	0.8877
9	0.8549	0.8304
10	0.9244	0.8979
11	0.9409	0.9286
12	0.9323	0.9270
13	0.9473	0.9179
14	0.9180	0.9219
15	0.9257	0.9293
16	0.9691	0.9452
17	0.9691	0.9513
18	0.9659	0.9648
19	0.9703	0.9515
20	0.9144	0.9128
21	0.6502	0.6159
22	0.6499	0.6256
23	0.3330	0.2628
>24	0.3126	0.2898
27	0.0000	0.0000

For operational pilots and formal training IPs, quarterly flight hours are calculated from a normal distribution with a mean of 54.0 hours and standard deviation of 5.196 hours (Garton, 31 Oct 96). Staff officers on flying status received their quarterly fly hours from a normal distribution with a mean of 12.0 hours and stand deviation of 3.464 hours (Garton, 16 Dec 96). Graduates of RTU received 80 hours in their primary aircraft (Garton, 16 Dec 96).

Verification and Validation

The definition of verification is building the model right; i.e., is the code constructed to perform correctly as envisioned by the programmer. Validation is defined as building the right model: i.e., does the simulation accurately represent the real world system (Banks, Carson and Nelson, 1996:400).

As each routine of the program was developed, initial verification was accomplished. For each routine, initial verification used a extremely small input data set of 6 to 10 pilots. The small size of the data set allowed each pilot to be closely tracked through the simulation to ensure the code accomplished the required steps. As the program approached completion, final verification was accomplished from a data set with 10% of the actual pilots data. Runs, using this 10% data set, found several minor coding errors. (For example, to fill ISS and SSS slots graduates would be reassigned to the school. Adding an ISS and SSS counter field to the pilot entity ensured no pilot attended ISS or SSS more than once.)

Validation efforts start with developing a model with high face validity, from which outputs seem reasonable to experts of the system being modeled (Law and Kelton, 1982:338). A simulation of the full data set was run using the current CONUS time on station criteria of three years. Initial observations of the number of pilots in different years of service groups indicated a significant drop off in 11 to 16 years of service compared to original data set. Consultations with analysts at the AFPC Analysis Division showed that this future drop off in manning those year groups was expected due to the low number of UPT graduates in the early 1990's (Garton, 7 Jan 97). Although these

results were expected, they highlighted another error in the simulation. The original simulation assumed all RTU graduates were 2nd lieutenants, whose first assignment was UPT. This lead to unrealistic results; i.e., a growing number of unassigned pilots at the end of simulation. This growth occurred because prior to the eight years of service, retention rate is over 95%. When the simulation reflected the actual number of 2nd lieutenants, FAIPS, and prior assigned captains, the number of unassigned pilots did not grow out of control.

Initial Results

Twenty-seven simulation runs for each half year increments from 3.0 to 6.0 years CONUS TOS were initially accomplished. The results showed no statistical change in the average number of unfilled assignments per quarter. (See Figure 2 for results).

CONUS TOS alone demonstrated little effect on the number of unfilled critical rated assignments. A 2^2 factorial design with factors CONUS TOS and retention rates was accomplished. The high value for CONUS TOS was 6.0 years; the low value 3.0 years; and the center point 4.5 years. Comparisons between different years' retention rates is based on Total Active Rated Service (TARS), which is defined as the expected number of man-years of utilization as a rated officer for the average pilot or navigator after completion of initial flying training given existing retention rates (Wiseman, 31 Jan 97).
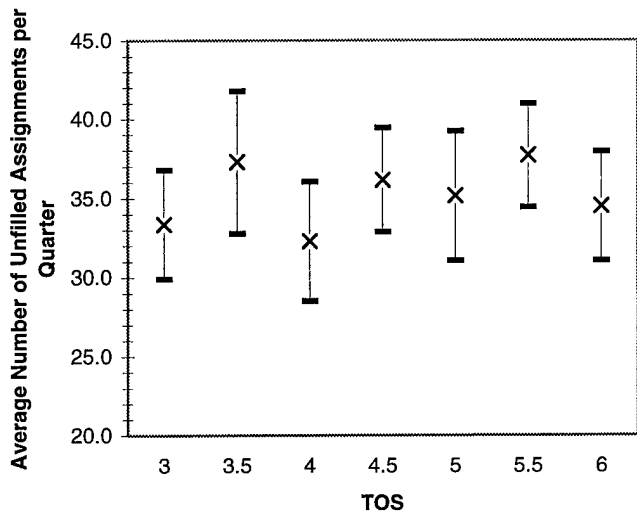
Figure 2: 90% Confidence Interval for Unfilled Assignments

Since the simulation calculates retention based on *commissioned* years of service, instead of rated years of service, TARS was modified by using commissioned years of service retention rates. For both the F15 and F16, high and low retention years corresponded to FY95 and FY92. The center point was calculated using a weighted average between the high and low retention years (See Tables 2 and 3).

Table 2   F15 Retention Rates

Years of Service	Low	Center	High
4	0.9851	0.9705	0.9600
5	0.9877	0.9949	1.0000
6	0.9048	0.9454	0.9744
7	0.8750	0.9479	1.0000
8	0.7778	0.9073	1.0000
9	0.8154	0.8639	0.8986
10	0.8972	0.9449	0.9790
11	0.9537	0.9695	0.9808
12	0.9081	0.9617	1.0000
13	0.8553	0.9229	0.9712
14	0.9403	0.9315	0.9252
15	0.9623	0.9699	0.9753
16	0.9344	0.9726	1.0000
17	1.0000	0.9657	0.9412
18	0.9780	0.9688	0.9623
19	0.9604	0.9727	0.9815
20	0.9114	0.8997	0.8913
21	0.7260	0.7819	0.8219
22	0.5484	0.6592	0.7385
23	0.1905	0.3991	0.5484
>24	0.3333	0.3657	0.3889
27	0.0000	0.0000	0.0000

Table 3   F16 Retention Rates

Years of Service	Low	Center	High
4	0.9776	0.9908	1.0000
5	1.0000	1.0000	1.0000
6	0.9286	0.9707	1.0000
7	0.9308	0.9675	0.9931
8	0.8470	0.9330	0.9928
9	0.7607	0.8498	0.9118
10	0.8653	0.9447	1.0000
11	0.9371	0.9651	0.9846
12	0.8978	0.9484	0.9837
13	0.8916	0.9366	0.9680
14	0.9091	0.9283	0.9417
15	0.8763	0.9209	0.9519
16	0.9143	0.9363	0.9516
17	0.8500	0.9565	0.9610
18	0.9885	0.9511	0.9250
19	0.9418	0.9568	0.9672
20	0.9383	0.9028	0.8781
21	0.5467	0.6371	0.7000
22	0.6327	0.6663	0.6897
23	0.1482	0.2999	0.4054
>24	0.0000	0.2144	0.3636
27	0.0000	0.0000	0.0000

IV. Results

2^2 Factorial Design Results

As stated in the previous chapter, the initial runs in which only TOS changes produces no statistical difference in the average number of unfilled critical rated assignments per quarter. Initial simulation runs of the 2^2 factorial design indicates that changes to TOS and TARS changes both the number of unfilled assignments and the number of pilots without assignments. Furthermore, the direction of movement for unfilled assignments and unassigned pilots occurs in opposite directions. As a result, the problem now becomes one of minimizing both the number of unfilled assignments and number of pilots without assignments.

The 2^2 factorial design uses coded variables, with three and six years TOS coded to -1.0 and 1.0, respectively. Similarly high and low TARS values coded to 1.0 and -1.0 (see Table 2 and 3). The 2^2 factorial design experiment resulted in the following surfaces:

$$Unfilled\ assignments = 99.96 - 123.92*TARS - 4.24*TOS \qquad (1)$$

$$Unassigned\ pilots = 182.55 + 201.75*TARS - 5.86*TOS \qquad (2)$$

The R^2 values for (1) and (2) are 0.833 and 0.952, respectively. Although these R^2 values are extremely high, the residual normal quantile plots and residual plots indicated the presence of second order effects (see Figures 3, 4, 5, and 6). The ANOVA tables for (1) and (2) are shown in Tables 4 and 5.

Figure 3: Residual Normal Quantile Plot for Equation 1

Figure 4: Residual Normal Quantile Plot for Equation 2
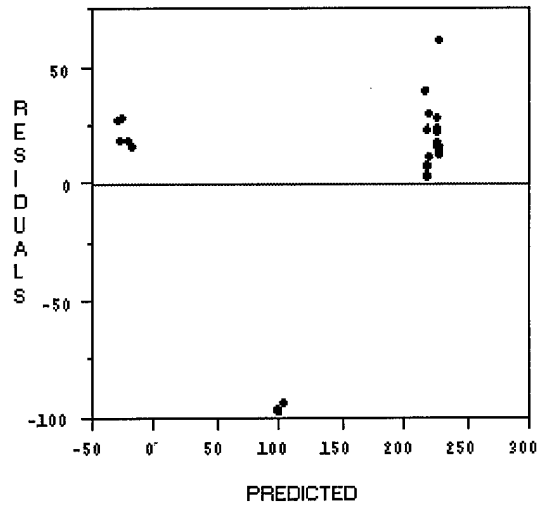
Figure 5:   Residual Plot for Equation 1

Figure 6:   Residual Plot for Equation 2

Table 4   ANOVA Table for Equation 1

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	368972.510	184486.00	67.4534
Error	27	73845.466	2735.00	p-value < .0001
Lack of Fit	2	71294.211	35647.10	349.3095
Pure Error	25	2551.255	102.10	p-value < .0001
Total	29	442817.976		

Table 5   ANOVA Table for Equation 2

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	977717.260	488859.00	265.0285
Error	27	49802.882	1845.00	p-value < .0001
Lack of Fit	2	48217.236	24108.60	380.1072
Pure Error	25	1585.646	63.40	p-value < .0001
Total	29	1027520.142		

Central Composite Design

The presence of second order effects necessitates the use of a second-order central composite design experiment. The axial points, coded value of ±1.4, for TOS were 2.2 and 6.6 years. However, calculating the axial points for TARS is not straightforward. Examination of the TARS values for the F15/F16 career fields from FY86 through FY96 was accomplished to determine the historical high and low TARS values for the career fields. Unfortunately, the high and low historical values for the F15 and F16 pilots are already used as 1.0 and -1.0. Instead of simply extrapolating to values with no historical backing, a search of all Air Force pilot career fields for historically-based boundaries for TARS values finds the upper and lower TARS values occurring for Bomber Pilots FY95 and Strategic Airlift Pilots FY91, respectively. The Strategic Airlift Pilots TARS coded to a value less than -1.41 for both F15 and F16 career fields. The axial point of -1.41 is

Table 6 Retention Rates for Coded TARS value of -1.41

Years of Service	F15	F16
4	0.9871	0.9833
5	0.9817	0.9880
6	0.9165	0.9282
7	0.8691	0.8972
8	0.6479	0.6850
9	0.7176	0.6919
10	0.8580	0.8427
11	0.9311	0.9232
12	0.9081	0.9029
13	0.9151	0.9323
14	0.9567	0.9407
15	0.9539	0.9108
16	0.9624	0.9518
17	0.9833	0.9585
18	0.9677	0.9732
19	0.9421	0.9331
20	0.9131	0.9266
21	0.6644	0.5754
22	0.6167	0.6578
23	0.3504	0.3263
>24	0.4614	0.2916
27	0.0000	0.0000

Table 7 Retention Rates for Coded TARS value of 1.13

Years of Service	F15	F16
4	0.9778	1.0000
5	1.0000	1.0000
6	0.9858	1.0000
7	1.0000	1.0000
8	0.9949	0.9886
9	0.9347	0.9796
10	0.9765	0.9735
11	0.9861	0.9926
12	0.9947	0.9881
13	0.9575	0.9405
14	0.9263	0.9277
15	0.9632	0.9483
16	0.9810	0.9575
17	0.9674	1.0000
18	0.9165	0.8597
19	0.9675	0.9500
20	0.8998	0.9105
21	0.7651	0.6944
22	0.7674	0.8033
23	0.4783	0.3913
>24	0.5654	0.7826
27	0.0000	0.0000

calculated by using a weighted average between this historical low boundary TARS and the -1.0 TARS value. (See Table 6). The Bomber Pilots high boundary TARS only codes out to 1.28 and 1.13, respectively, for F15 and F16 pilots; therefore the positive axial point is set to 1.13. A weighted average between the high boundary and 1.0 TARS was used to calculate the 1.13 coded value for F15 pilots. For F16 pilots the Bomber Pilots high boundary TARS is used (See Table 7).

Central composite design resulted in the following surfaces:

$$Unfilled\ Assignments = 2.06\ - 116.54*TARS - 2.09*TOS + 103.61*TARS^2 + 4.42*TARS*TOS + 6.68*TOS^2 \tag{3}$$

$$Unassigned\ Pilots = 102.52 + 197.09*TARS - 8.49*TOS + 89.78*TARS^2 - 5.83*TARS*TOS - 2.44*TOS^2 \tag{4}$$

The R^2 values are 0.990 and 0.997, respectively, for (3) and (4). ANOVA tables for (3) and (4) are shown in Tables 8 and 9. The residual normal quantile plots and residual plots indicates normality (see Figures 7, 8, 9, and 10). The contour plots indicates that TOS had little effect on either the number of unfilled assignments or unassigned pilots (see Figures 11 and 12).

Table 8   ANOVA Table for Equation 3

Source	DF	Sum of Squares	Mean Squares	F Ratio
Model	5	170299.8600	34060.0000	83.4035
Error	4	1633.5026	408.4000	p-value = .0004
Lack of Fit	3	1633.5002	544.5000	228034.4000
Pure Error	1	0.0024	0.0024	p-value = .0015
Total	9	171933.3626		

Table 9   ANOVA Table for Equation 4

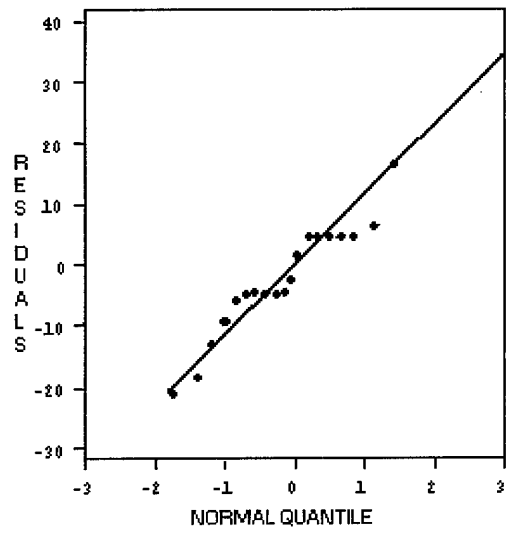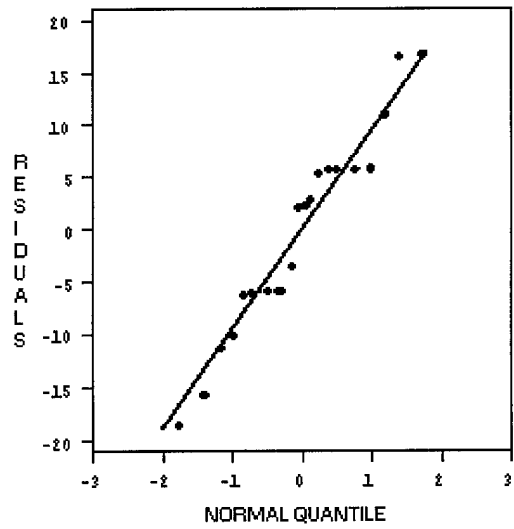| Source	DF	Sum of Squares	Mean Squares	F Ratio
Model	5	275848.07	55169.60	231.4826
Error	4	953.33	238.30	p-value < .0001
Lack of Fit	3	932.49	310.83	14.9184
Pure Error	1	20.84	20.84	p-value = .1875
Total	9	276801.40		
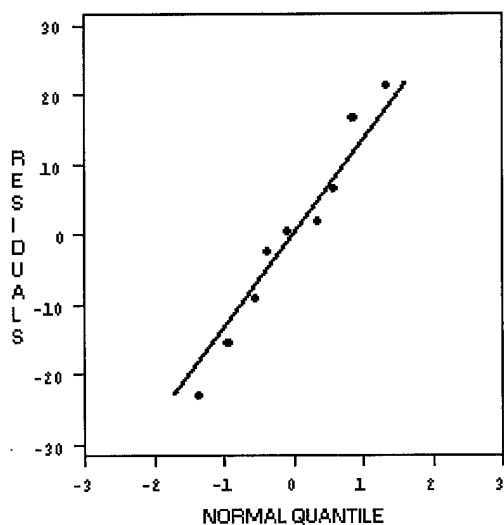
Figure 7:   Residual Normal Quantile Plot for Equation 3
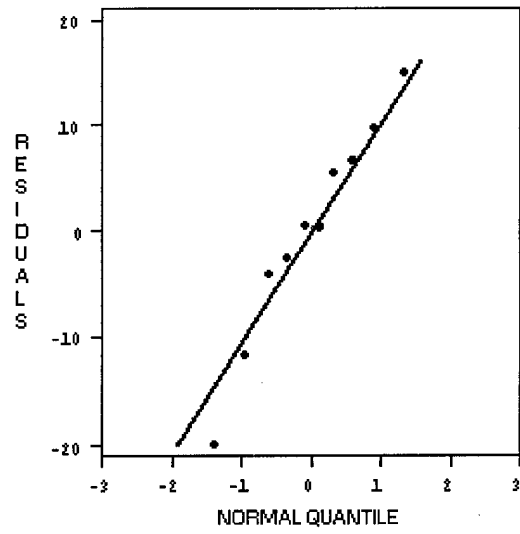
Figure 8:   Residual Normal Quantile Plot for Equation 4
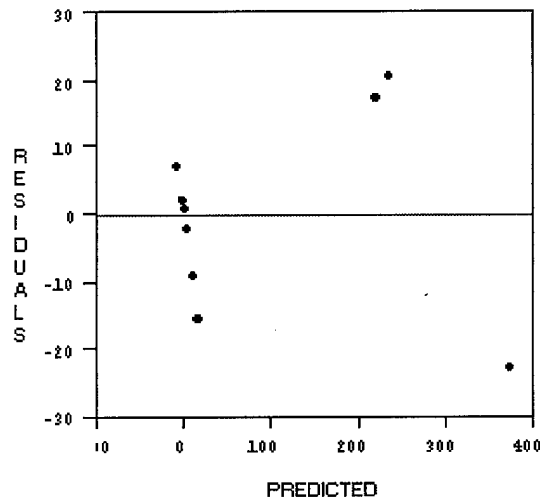
Figure 9:   Residual Plot for Equation 3
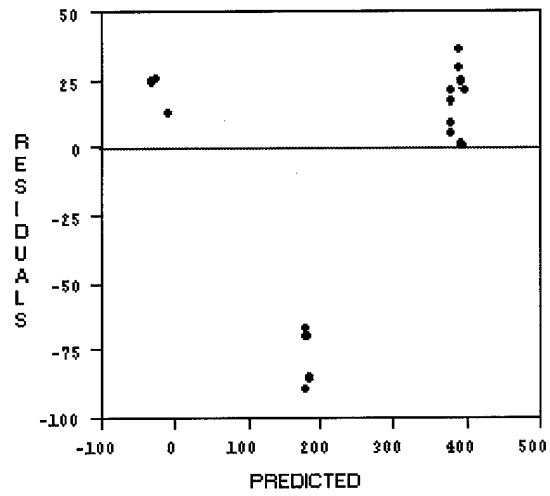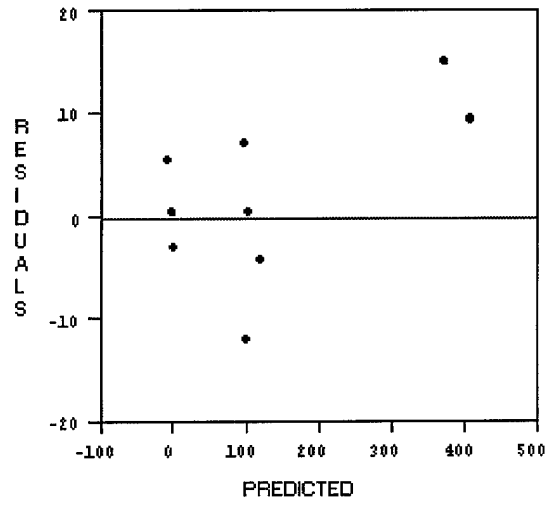
Figure 10: Residual Plot for Equation 4
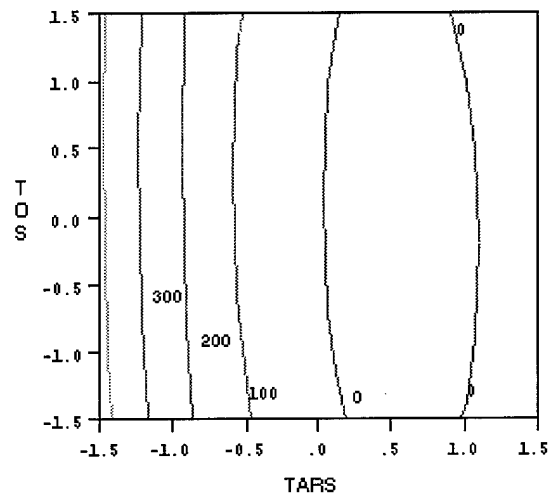
Figure 11: Contour Plot for Equation 3
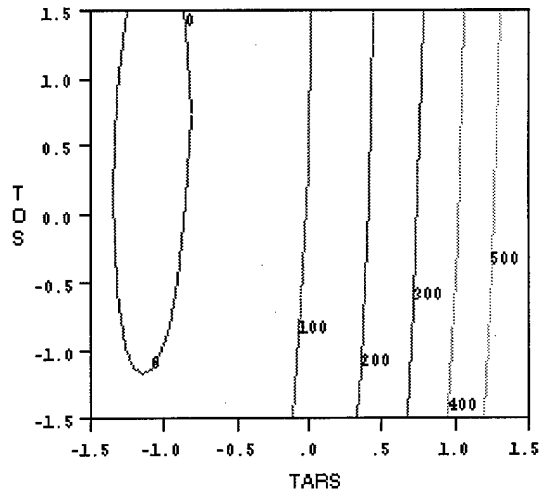
Figure 12: Contour Plot for Equation 4

TARS Alone

The contour plots show that only TARS has a significant effect on both the number of unfilled assignments and unassigned pilots. Eliminating TOS from the surface results in the following equations:

$$Unfilled\ Assignments = 9.37 - 116.78*TARS + 100.82*TARS^2 \qquad (5)$$

$$Unassigned\ Pilots = 105.19 + 197.00*TARS + 88.76*TARS^2 \qquad (6)$$

The R^2 values are 0.989 and 0.994 respectively for (5) and (6). ANOVA tables are shown in tables 10 and 9. These two surfaces intersect at TARS equal to coded value of -0.302 (See Figure 13), or 10.559 and 10.819 TARS values, for the F15 and F16 respectively. The corresponding average number of unfilled assignments and unassigned pilots combined is 107 per quarter. The minimization of the sum of unfilled assignments

27

and unassigned pilots occurs at -0.212, or 10.830 and 11.103 TARS values, for the F15

and F16 respectively. The number of unfilled assignments and unassigned pilots is 39

and 67, respectively, for a total of 106 per quarter.

Table 10   ANOVA Table for Equation 5

Source	DF	Sum of Squares	Mean Squares	F Ratio
Model	2	169977.8900	84988.900	304.2351
Error	7	1955.4698	279.400	p-value < .0001
Lack of Fit	2	1805.2009	907.600	30.0329
Pure Error	5	150.2689	30.054	p-value = .0016
Total	9	171933.3598		

Table 11   ANOVA Table for Equation 6

Source	DF	Sum of Squares	Mean Squares	F Ratio
Model	2	275113.6500	137557.000	570.5230
Error	7	1687.7457	241.000	p-value < .0001
Lack of Fit	2	857.9419	428.971	2.5848
Pure Error	5	829.8038	165.961	p-value = .1695
Total	9	276801.3957		
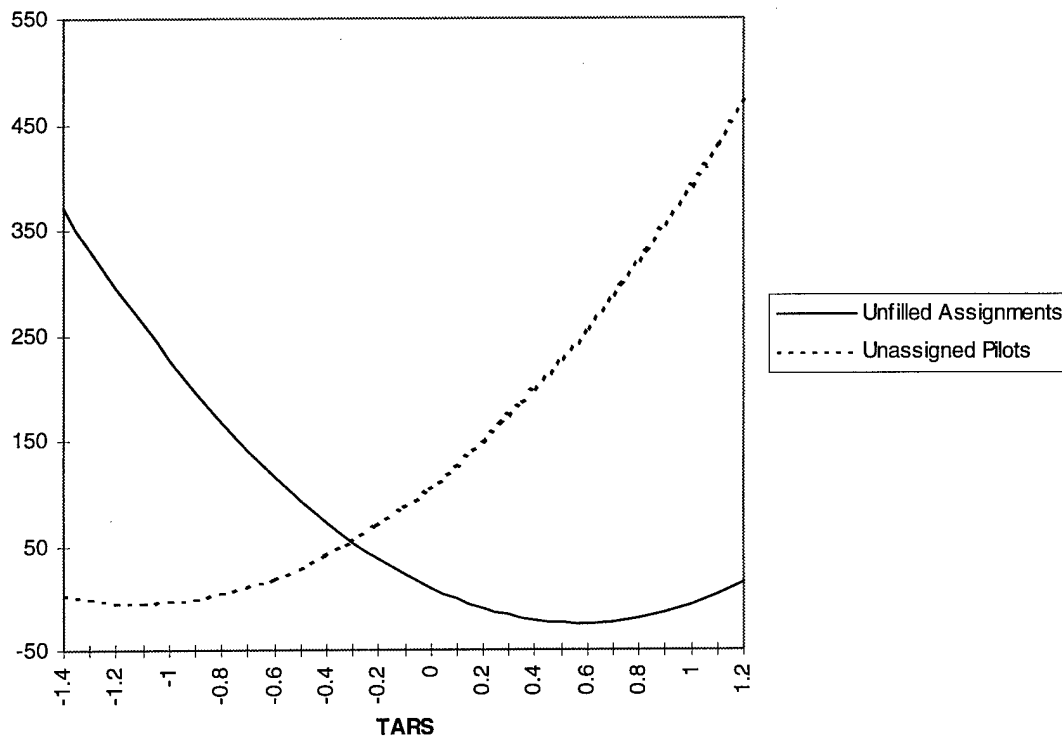
Figure 13: Combined F15/F16 manning with TARS as only variable

Close examination of Figure 9 indicates two concerns; negative values for both unfilled assignments and unassigned pilots, and an increase in unfilled assignments at the highest TARS value. In reality negative values will not exist since the lowest possible value is zero. The second-order central composite design fits a second-order surface between known data points. Therefore, the lack of fit of the second-order approximation leads to both anomalies.

V. Conclusions and Recommendation

Conclusion

TOS has no effect on filling critical rated assignments. Retention is the major

effect on both the number of unfilled critical rated assignments and the number of

unassigned pilots. The TARS value where unfilled assignments and unassigned pilots

intersects is 10.559 and 10.819 for the F15 and F16, respectively. Using these TARS

results in the combined number of unfilled critical rated assignments and unassigned

pilots being 107 per quarter. The minimization of the combination of unfilled

assignments and unassigned pilots occurs at TARS values of 10.830 and 11.103, for the

F15 and F16 respectively, for a total of 106 per quarter.

This research showed that retention has a significant effect on the Air Force's

rated assignment process. This conforms to Olson's research that also indicates retention

as an important factor in the fulfillment of pilots flight gates (Olson, 1987: 84). However,

the network construction of his model only allows pilots to leave the system at the end of

an assignment, thus limiting his ability to examine retention's effect (Olson, 1987: 75).

The capability to annually calculate retention gives a more realistic view of the Air Force

rated assignment process and demonstrate the significant effect of retention.

Recommendations

TARS is the retention factor used during this simulation. TARS is the

summation of the cumulative retention rate for rated year groups in a given year;

therefore, any specific TARS value can be found from different sets of rated year group

retention rates. The possibility exists that different sets of rated year group retention rates for a specific TARS may significantly effect the number of unfilled assignments and unassigned pilots differently. Further work should be accomplished to examine this possibility. For convenience, the simulation should be modified so that retention values in ROUTINE RETENT15 and ROUTINE RETENT16 can be changed automatically by the simulation versus the current setup, which requires the operator to manually change the retention values. In addition, the simulation should be expanded to include the entire rated personnel force-- all pilots and navigators.

The response surface for the simulation's predicted unfilled assignments and unassigned pilots was determined by the regression methods of response surface methodology. Another possible approach to modeling it response would be a neural network.

Appendix A: Computer Code

Preamble   " Defines all global variables for simulation
            normally mode is integer

            the system owns an OVERSEAS,
                        a CONUS,
                        a FILLED, an UNFILLED, an UNASSIGNED,
                        a Twenty,
                        an QCC,
                        an QOPS,
                        an QFTIP, an QALO, an QAFIT,
                        a QSTAFF

permanent entities

every PILOT has a SSN,
            a GRADE,
            a DATE.OF.RANK,   "-- real integer value year, decimal month
            a YEARS.SERVICE,
            a DATE.ARRIVED,   "-- month and year arrived on station
            a MOVE.DATE,   "-- month and year must PCS to new assignment
            a WEAPON,   "-- weapon system
            a GATE.TIME,   "-- number of years aviation service time
            a TOTAL.HOURS,   "-- total flying hours
            a F15.HOURS,   "-- total F-15 flying hours
            a F16.HOURS,   "-- total F-16 flying hours
            a F.HOURS,   "-- total Fighter flying hours
            a CURRENT.HOURS,   "-- Flight hours in current assignment
            a FLYING.NOW,   "-- 1 in Flying slot currently
            an OPS,   "-- number of Ops assignments including current one
            a STAFF,   "-- number of Staff assignments including current one
            an ALO,   "-- number of ALO assignments including current one
            an AETC,   "-- number of AETC assignments including current one
            an CC,   "-- number of Commander or Ops officer assignments
            an ISS,   "-- Counter of ISS assginments
            a SSS,   "-- Counter of SSS assginments
            an AFIT,   "-- Counter of AFIT assginments
            a LOCATION,   "-- Current Assignment location-- OVERSEAS or CONUS
            an ASSGN   "-- Current Assignment

            may belong to a CONUS,   "--Set of Pilots assigned to CONUS locations
            may belong to an OVERSEAS,   "--Set of Pilots assigned to OVERSEAS locations
            may belong to an UNASSIGNED, "--Set of Pilots without assignments
            may belong to a Twenty,   "--Set of Pilots with 20 years of service
            may belong to an QCC   "--Set used to sort pilots for Command assignments
            may belong to an QOPS,   "--Set used to sort pilots for Operations assignments
            may belong to an QFTIP,   "--Set used to sort pilots for Formal Training IP assignments
            may belong to an QALO,   "--Set used to sort pilots for ALO assignments
            may belong to an QAFIT,   "--Set used to sort pilots for SCHOOL assignments
            may belong to a QSTAFF   "--Set used to sort pilots for STAFF assignments

define DATE.OF.RANK, YEARS.SERVICE, DATE.ARRIVED, GATE.TIME,
      TOTAL.HOURS, F15.HOURS, F16.HOURS, F.HOURS as real variable
define MOVE.DATE as a real variable
define LOCATION, ASSGN, WEAPON as a text variable
define CONUS as a set ranked by low DATE.ARRIVED

33

define OVERSEAS as a set ranked by low DATE.ARRIVED
define UNASSIGNED as a set ranked by high LOCATION
define twenty as a set ranked by high SSN
define QCC as a set ranked by high Grade, then by low CC, then by high LOCATION
define QOPS as a set ranked by low GATE.TIME, then by low GRADE, then by high
                      LOCATION
define QFTIP as a set ranked by low AETC, then by low GATE.TIME, then by low
                      GRADE, then by high LOCATION
define QALO as a set ranked by low ALO, then by low GATE.TIME, then by high LOCATION
define QAFIT as a set ranked by high GATE.TIME, then by high LOCATION
define QSTAFF as a set ranked by high GRADE, then by high GATE.TIME, then by high
                      LOCATION

every ASSIGNMENT has a NAME,
           a LOC,   "-- location OVERSEAS or CONUS
           an OFFICER,   "-- person in assignment now
           a F.TYPE,   "-- F15, F16 or Fighter billet
           a Fly   " is it a flying assignment

           may belong to a FILLED, "-- set of filled assignments
           may belong to an UNFILLED "-- set of unfilled assignments

define NAME, LOC, F.TYPE as a text variables
define FILLED as a set
define UNFILLED as a set ranked by low OFFICER
define DATE,   "-- running date of Simulation, integer year, decimal month
       SIMLEN as a real variables "-- length of simulation run
Define Cot, Dummy, F15con, ExpF15Con, F16con, ExpF16Con, F15ovr, ExpF15ovr, F16ovr,
ExpF16ovr, re15, re16, FLySeed, uptseed, LtColSeed,
 RetSeed as integer variables
Define Cost1, Cost2, Cost3, Cost4, OS.Rule, TOS.RULE as Real Variables
Define out, stat as a Text Variable

event notices include Ager   "-- Event to age pilots

Define Readin as routine   "-- rountine to read in data file
Define Retent15 as routine   "-- routine to determine if F15 pilot is retented
Define Retent16 as routine   "-- routine to determine if F16 pilot is retented
DEfine Promotion as routine   "-- routine to accomplish promotions
Define ProCapt as routine   "-- 1Lt and Capt promotion board
Define Assign as routine   "-- Routine for do assignment process
Define InitAsgn as routine   "-- Routine initials assignments after Reading in of data
Define UPTGrad as routine   "-- Calculates RTU grads and assigns them to oper units
Define CCAsgn as routine   "-- accomplishes Command assignments
Define FTAsgn as routine   "-- accomplishes Formal Training IP assignments
Define OPSAsgn as routine   "-- accomplishes Operational Unit assignments
Define SCHAsgn as routine   "-- accomplishes School Assignments
Define ALOAsgn as routine   "-- accomplishes ALO assignments
Define STFAsgn as routine   " --accomplishes Staff Assignments
DEFINE WRITESTAT as routine "--Outputs quarterly statistics
Define ExpCal as routine   "--Calculates experience levels.
end

```
Main   "--Main program which starts the simulation  by readin in data and calling event ager

  OS.Rule = 3.0

  call readin

  call expcal

  open 21 for output, file name = stat

  call writestat

  schedule an ager at 0.25

  start simulation

end
```

Routine Readin "-- Routine to read in the data from pilot data set

open unit 8 for input, file name ="dataset.prn"
  Use 8 for input

  Dummy = 1

let eof.v = 1

  Create Each PILOT(10000)

  while eof.v ne 2   "--loop to read in data until end of file
    do

      SSN(Dummy) = Dummy

      read YEARS.SERVICE(Dummy)
      read GRADE(Dummy)
      read DATE.OF.RANK(Dummy)
      read ASSGN(Dummy)
      read LOCATION(Dummy)
      read DATE.ARRIVED(Dummy)
      read FLYING.NOW(Dummy)
      read GATE.TIME(Dummy)
      read F15.HOURS(Dummy)
      read F16.HOURS(Dummy)
      read F.Hours(Dummy)
      read Total.HOURS(Dummy)
      read WEAPON (Dummy)

"-- IF Else logic to put each pilot into the correct location set CONUS of OVERSEAS
    IF LOCATION(Dummy) = "CONUS"
        file Dummy in CONUS
      ELSE IF LOCATION(Dummy) = "OVERSEAS"
          file Dummy in OVERSEAS
        always
      always

    Dummy = Dummy +1
    loop

Close 8

Write "Put in Starting Date of Simulation. (in Year.month in Decimal)" as T *,/
Read Date

Write " Input length of simulation run. (as Decimal of years)" as T *,/
Read Simlen

Write " Input Time On Station Rule for CONUS as Decimal" as T *,/
Read TOS.RULE

"Write "Type in name for output file of pilot data " as T *,/
"Read out

Write "Type in name for output of statistics " as T *,/
read stat

Write "Type in an integer between 1 and 10 for Lt Col promotion seed " as T *,/
read LtcolSeed

Write "Type in an integer between 1 and 10 for Retention Seed" as T *,/
read Retseed

Write "Type in an integer between 1 and 10 for Flight Hours Seed" as T *,/
read Flyseed

Write "Type in an integer between 1 and 10 for UPT Grad Location Seed" as T *,/
read UPTseed

Call InitAsgn

END

Routine InitAsgn   ''—Creates all the assignment data need for all assignments held by pilots

Total = Dummy - 2
Create Each Assignment(Total)

For i= 1 to Total   ''—Loop to go through all pilots to set their assignments into assignment list
  DO
    IF ASSGN(i) = "CC/OPS"
      NAME(i) = "CC/OPS"
      Loc(i) = LOCATION(i)
      OFFICER(i) = SSN(i)
      F.TYPE(i) = WEAPON(i)
      CC(i) = 1
      Fly(i) = FLYING.NOW(i)
    ENDIF

    IF ASSGN(i) = "CC/OPS*"
      NAME(i) = "CC/OPS"
      ASSGN(i) = "CC/OPS"
      Loc(i) = LOCATION(i)
      OFFICER(i) = SSN(i)
      F.TYPE(i) = "Fighter"
      CC(i) = 1
      Fly(i) = FLYING.NOW(i)
    ENDIF

    IF ASSGN(i) = "F15OPS"
      NAME(i) = "F15OPS"
      Loc(i) = LOCATION(i)
      OFFICER(i) = SSN(i)
      F.TYPE(i) = "F15"
      OPS(i) = 1
      Fly(i) = FLYING.NOW(i)
    ENDIF

    IF ASSGN(i) = "F16OPS"
      NAME(i) = "F16OPS"
      Loc(i) = LOCATION(i)
      OFFICER(i) = SSN(i)
      F.TYPE(i) = "F16"
      Fly(i) = FLYING.NOW(i)
      OPS(i) = 1
    ENDIF

    IF ASSGN(i) = "FT-IP"
      NAME(i) = "FT-IP"
      Loc(i) = LOCATION(i)
      OFFICER(i) = SSN(i)
      F.TYPE(i) = WEAPON(i)
      Fly(i) = FLYING.NOW(i)
      AETC(i) = 1
    ENDIF

    IF ASSGN(i) = "FT-IP*"

```
      NAME(i) = "FT-IP"
   Loc(i) = LOCATION(i)
    OFFICER(i) = SSN(i)
    F.TYPE(i) = "Fighter"
    Fly(i) = FLYING.NOW(i)
    AETC(i) = 1
ENDIF

IF ASSGN(i) = "ALO"
   NAME(i) = "ALO"
   Loc(i) = LOCATION(i)
   OFFICER(i) = SSN(i)
   F.TYPE(i) = "Fighter"
   ALO(i) = 1
   Fly(i) = FLYING.NOW(i)
ENDIF

   IF ASSGN(i) = "ISS-STU"
   NAME(i) = "ISS-STU"
   Loc(i) = LOCATION(i)
   OFFICER(i) = SSN(i)
   F.TYPE(i) = WEAPON(i)
   Fly(i) = FLYING.NOW(i)
   ISS(i) = 1
ENDIF

   IF ASSGN(i) = "SSS-STU"
   NAME(i) = "SSS-STU"
   Loc(i) = LOCATION(i)
   OFFICER(i) = SSN(i)
   F.TYPE(i) = WEAPON(i)
   Fly(i) = FLYING.NOW(i)
   SSS(i) = 1
ENDIF

IF ASSGN(i) = "AFIT-STU"
   NAME(i) = "AFIT-STU"
   Loc(i) = LOCATION(i)
   OFFICER(i) = SSN(i)
   F.TYPE(i) = WEAPON(i)
   Fly(i) = FLYING.NOW(i)
   AFIT(i) = 1
ENDIF

IF ASSGN(i) = "STAFF-FTR"
   NAME(i) = "STAFF-FTR"
   Loc(i) = LOCATION(i)
   OFFICER(i) = SSN(i)
   F.TYPE(i) = "Fighter"
   STAFF(i) = 1
   Fly(i) = FLYING.NOW(i)
ENDIF

IF ASSGN(i) = "STAFF_F16"
   NAME(i) = "STAFF_F16"
```

```
            Loc(i) = LOCATION(i)
            OFFICER(i) = SSN(i)
            F.TYPE(i) = "F16"
            STAFF(i) = 1
            Fly(i) = FLYING.NOW(i)
         ENDIF

      IF ASSGN(i) = "STAFF_F15"
         NAME(i) = "STAFF_F15"
         Loc(i) = LOCATION(i)
         OFFICER(i) = SSN(i)
         F.TYPE(i) = "F15"
         STAFF(i) = 1
         Fly(i) = FLYING.NOW(i)
      ENDIF

   LOOP

FOR each Assignment
   FILE ASSIGNMENT in FILLED

   For Each Pilot of Conus    ''—Loop to set must move date for pilots with CONUS assignments
      DO
       IF ASSGN="CC/OPS"    ''—all Command slots have a 2.0 years length of tour
         MOVE.DATE = DATE.ARRIVED + 2.0
       ELSE IF ASSGN = "AFIT-STU"    ''—Length of AFIT Tour 1.5 years
          MOVE.DATE = DATE.ARRIVED + 1.5
          ELSE IF ASSGN = "ISS-STU" or ASSGN = "SSS-STU"   ''—ISS and SSS tour length of 1.0 years
             MOVE.DATE = DATE.ARRIVED + 1.0
             ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE   ''—Set all other Assignments to Conus tour
                                                               Length
         ALWAYS
         ALWAYS
         ENDIF
         LOOP

   FOR Each Pilot of OVERSEAS
      DO
       IF ASSGN="CC/OPS"    ''—all Command slots have a 2.0 years length of tour
          MOVE.DATE = DATE.ARRIVED + 2.0
       ELSE IF ASSGN = "AFIT-STU"   ''—Length of AFIT Tour 1.5 years
          MOVE.DATE = DATE.ARRIVED + 1.5
          ELSE IF ASSGN = "ISS-STU" or ASSGN = "SSS-STU"   ''—ISS and SSS tour length of 1.0 years
             MOVE.DATE = DATE.ARRIVED + 1.0
             ELSE MOVE.DATE = DATE.ARRIVED + OS.Rule   ''Set all other assignment to Overseas Tour
                                                               Length
         ALWAYS
         ALWAYS
         ENDIF
         LOOP
End
```

event ager saving the event notice

```
DATE = Date + 0.25            "—Advance date by a quarter

for each PILOT of CONUS

  do
    YEARS.SERVICE = YEARS.SERVICE + 0.25   "—Advance each pilots years of service

    If FLYING.NOW = 1       "—If pilot has flying Job increase gate time
       GATE.TIME = GATE.TIME + 0.25
       HRS = normal.f(54.0,5.196,Flyseed)
    endif

    If ASSGN = "F15OPS"   "—Pilot assigned to F15 operational unit  increase flight hours
        TOTAL.HOURS = TOTAL.HOURS + HRS
        F15.HOURS = F15.HOURS + HRS
        CURRENT.HOURS = CURRENT.HOURS + HRS
        F.HOURS = F.HOURS + HRS

      else  If ASSGN = "F16OPS"  "—Pilot assigned to F16 operational unit  increase flight hours
        TOTAL.HOURS = TOTAL.HOURS + HRS
        F16.HOURS = F16.HOURS + HRS
        CURRENT.HOURS = CURRENT.HOURS + HRS
        F.HOURS = F.HOURS + HRS

       else  IF ASSGN = "FT-IP" and Weapon = "F15" "—update Flight hours to IP at F15 RTU
          TOTAL.HOURS = TOTAL.HOURS + HRS
          F15.HOURS = F15.HOURS + HRS
          CURRENT.HOURS = CURRENT.HOURS + HRS
          F.HOURS = F.HOURS + HRS

        ELSE IF ASSGN = "FT-IP" and WEAPON ="F16" "—update Flght hours to IP at F16 RTU

            TOTAL.HOURS = TOTAL.HOURS + HRS
            F16.HOURS = F16.HOURS + HRS
            CURRENT.HOURS = CURRENT.HOURS + HRS
            F.HOURS = F.HOURS + HRS

         ELSE IF ASSGN = "FT-IP" "—Update Flight Hours for UPT IP
             TOTAL.HOURS = TOTAL.HOURS + HRS
             CURRENT.HOURS = CURRENT.HOURS + HRS

          ELSE IF Weapon = "F15" "—Update F15 Staff Flyers flight Hours
              HRS = normal.f(12.0,3.464,Flyseed)
              TOTAL.HOURS = TOTAL.HOURS + HRS
              F15.HOURS = F15.HOURS + HRS
              CURRENT.HOURS = CURRENT.HOURS + HRS
              F.HOURS = F.HOURS + HRS

           ELSE IF Weapon = "F16" "—Update F16 Staff Flyers flight Hours
               HRS = normal.f(12.0,3.464,Flyseed)
               TOTAL.HOURS = TOTAL.HOURS + HRS
               F16.HOURS = F16.HOURS + HRS
               CURRENT.HOURS = CURRENT.HOURS + HRS
```

```
                    F.HOURS = F.HOURS + HRS
                Endif

            Endif

        endif

      endif

    endif

  ENDIF

  Endif

loop

for each PILOT of OVERSEAS
  do
    YEARS.SERVICE = YEARS.SERVICE + 0.25 ''—Advance each pilots years of service

    If FLYING.NOW = 1  ''—Advance each pilots years of service
      GATE.TIME = GATE.TIME + 0.25
      HRS = normal.f(54.0,5.196,Flyseed)
    Endif

    If ASSGN = "F15OPS"  ''—Pilot assigned to F15 operational unit  increase flight hours
        TOTAL.HOURS = TOTAL.HOURS + HRS
        F15.HOURS = F15.HOURS + HRS
        CURRENT.HOURS = CURRENT.HOURS + HRS
        F.HOURS = F.HOURS + HRS

    else  If ASSGN = "F16OPS"  ''—Pilot assigned to F16 operational unit  increase flight hours
        TOTAL.HOURS = TOTAL.HOURS + HRS
        F16.HOURS = F16.HOURS + HRS
        CURRENT.HOURS = CURRENT.HOURS + HRS
        F.HOURS = F.HOURS + HRS

      else  IF ASSGN = "FT-IP" and Weapon = "F15"  ''—update Flight hours to IP at F15 RTU
          TOTAL.HOURS = TOTAL.HOURS + HRS
          F15.HOURS = F15.HOURS + HRS
          CURRENT.HOURS = CURRENT.HOURS + HRS
          F.HOURS = F.HOURS + HRS

        ELSE IF ASSGN = "FT-IP" and WEAPON ="F16"  ''—update Flght hours to IP at F16 RTU
            TOTAL.HOURS = TOTAL.HOURS + HRS
            F16.HOURS = F16.HOURS + HRS
            CURRENT.HOURS = CURRENT.HOURS + HRS
            F.HOURS = F.HOURS + HRS

          ELSE IF ASSGN = "FT-IP''  ''—Update Flight Hours for UPT IP

              TOTAL.HOURS = TOTAL.HOURS + HRS
              CURRENT.HOURS = CURRENT.HOURS + HRS
```

```
                ELSE IF Weapon = "F15" ''—Update F15 Staff Flyers flight Hours
                    HRS = normal.f(12.0,3.464,Flyseed)
                    TOTAL.HOURS = TOTAL.HOURS + HRS
                    F15.HOURS = F15.HOURS + HRS
                    CURRENT.HOURS = CURRENT.HOURS + HRS
                    F.HOURS = F.HOURS + HRS

                ELSE IF Weapon = "F16" ''—Update F16 Staff Flyers flight Hours
                    HRS = normal.f(12.0,3.464,Flyseed)
                    TOTAL.HOURS = TOTAL.HOURS + HRS
                    F16.HOURS = F16.HOURS + HRS
                    CURRENT.HOURS = CURRENT.HOURS + HRS
                    F.HOURS = F.HOURS + HRS
                Endif

            Endif

        endif
        endif

    endif

    ENDIF

    Endif
loop

for each PILOT of UNASSIGNED
    do
        YEARS.SERVICE = YEARS.SERVICE + 0.25  ''—Advance each pilots years of service

        If FLYING.NOW = 1  ''—Advance each pilots years of service
            GATE.TIME = GATE.TIME + 0.25
            HRS = normal.f(54.0,5.196,Flyseed)
        endif

        If ASSGN = "F15OPS"   ''—Pilot assigned to F15 operational unit  increase flight hours
            TOTAL.HOURS = TOTAL.HOURS + HRS
            F15.HOURS = F15.HOURS + HRS
            CURRENT.HOURS = CURRENT.HOURS + HRS    •
            F.HOURS = F.HOURS + HRS

        else  If ASSGN = "F16OPS"  ''—Pilot assigned to F16 operational unit  increase flight hours
            TOTAL.HOURS = TOTAL.HOURS + HRS
            F16.HOURS = F16.HOURS + HRS
            CURRENT.HOURS = CURRENT.HOURS + HRS
            F.HOURS = F.HOURS + HRS

        else  IF ASSGN = "FT-IP" and Weapon = "F15" ''—update Flight hours to IP at F15 RTU
            TOTAL.HOURS = TOTAL.HOURS + HRS
            F15.HOURS = F15.HOURS + HRS
            CURRENT.HOURS = CURRENT.HOURS + HRS
            F.HOURS = F.HOURS + HRS

        ELSE IF ASSGN = "FT-IP" and WEAPON ="F16" ''—update Flght hours to IP at F16 RTU
```

43

```
                    TOTAL.HOURS = TOTAL.HOURS + HRS
                    F16.HOURS = F16.HOURS + HRS
                    CURRENT.HOURS = CURRENT.HOURS + HRS
                    F.HOURS = F.HOURS + HRS

                ELSE IF ASSGN = "FT-IP"  ''—Update Flight Hours for UPT IP
                    TOTAL.HOURS = TOTAL.HOURS + HRS
                    CURRENT.HOURS = CURRENT.HOURS + HRS

                    ELSE IF Weapon = "F15"  ''—Update F15 Staff Flyers flight Hours
                        HRS = normal.f(12.0,3.464,Flyseed)
                        TOTAL.HOURS = TOTAL.HOURS + HRS
                        F15.HOURS = F15.HOURS + HRS
                        CURRENT.HOURS = CURRENT.HOURS + HRS
                        F.HOURS = F.HOURS + HRS

                    ELSE IF Weapon = "F16"  ''—Update F16 Staff Flyers flight Hours
                        HRS = normal.f(12.0,3.464,Flyseed)
                        TOTAL.HOURS = TOTAL.HOURS + HRS
                        F16.HOURS = F16.HOURS + HRS
                        CURRENT.HOURS = CURRENT.HOURS + HRS
                        F.HOURS = F.HOURS + HRS
                    Endif
                Endif
              endif
            endif
          endif
        ENDIF
      Endif
  Loop

call procapt  ''Call 1st Lt and Capt  promotion routine

if trunc.f(time.v)*1.0 = time.v  ''—Call promotion  to major and Lt Col once a year
    call promotion

endif

Call Retent15  ''—Call retention calculation for F15 pilots
Call Retent16  ''—Call retention calculation for f16 pilots
COT = 0

call Assign   ''—Call routine to due assignments
Call Writestat  ''—Write the quarterly stats.

 If time.v < SIMLEN   ''—Check to see if simulation is complete
    schedule an ager at time.v + .25
  endif

end
```

Routine Retent15 ''—Routine to see if F15 pilot is retented

Count = 0

"-- secton to ensure that major with 20 years of service are retired--
''—Find the number of majors with 2o years of service

For every Pilot of Conus with Weapon = "F15"
  Do
    IF (YEARS.SERVICE >= 20) and (YEARS.SERVICE < 20.25)
    Count = Count + 1
    File Pilot in Twenty
    Endif
  Loop

For every Pilot of Overseas with Weapon ="F15"
  Do
    IF (YEARS.SERVICE >= 20) and (YEARS.SERVICE < 20.25)
    Count = Count + 1
    File Pilot in Twenty
    Endif
  Loop

For every Pilot of Unassigned with Weapon ="F15"
  Do
    IF (YEARS.SERVICE >= 20) and (YEARS.SERVICE < 20.25)
    Count = Count + 1
    File Pilot in Twenty
    Endif
  Loop

Count = trunc.f(count*(1-0.9105)) "-- determine number of needed to be remove from service

  For every Pilot of twenty
    Do "--- loop to remove all majors with 20 years of service
    If Grade = 4
      Remove Pilot from Twenty
      If Pilot is in Conus
        Remove Pilot from Conus
      Endif
      If Pilot is in Overseas
        Remove Pilot from Overseas
      Endif
      If Pilot is in Unassigned
        Remove Pilot from Unassigned
      Endif
      For Each ASSIGNMENT with OFFICER = SSN ''--Put all removed pilots assignment in to
        Do   ''—set of unfilled assignments
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
        Endif

```
        Loop

      Count = Count-1

    Endif
  Loop

For EAch Pilot of Twenty, While Count > 0 ''—If after removing majors have removed less pilots that
  Do                                         ''—retention factor would keep removing 20 year pilots
      REmove Pilot from Twenty
      If Pilot is in Conus
        Remove Pilot from Conus
      Endif
      If Pilot is in Overseas
        Remove Pilot from Overseas
      Endif
      If Pilot is in Unassigned
        Remove Pilot from Unassigned
      Endif

      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Count = Count-1
  Loop

For Every Pilot of Twenty
    Remove Pilot from Twenty




For Every PILOT of CONUS with WEAPON = "F15"   ''—For each F15 pilot in Conus do a random draw
                                               ''—to see is pilot is retented based on
                                               ''—commissioned years of service retention rate

DO

  IF (Years.Service >= 4) and (Years.Service < 4.25)
     If random.f(RetSeed) > 1.0

       ''---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
            Endif
          Loop

       Remove PILOT from CONUS
```

46

```
        Endif
ENDIF

IF (Years.Service >= 5) and (Years.Service < 5.25)
    If random.f(RetSeed) > 1.0

        "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
    Endif

ENDIF

IF (Years.Service >= 6) and (Years.Service <6.25)
    If random.f(RetSeed) > 1.0

        "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 7) and (Years.Service <7.25)
    If random.f(RetSeed) > 1.0

        "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 8) and (Years.Service <8.25)
    If random.f(RetSeed) > .9886
```

```
      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
      Endif
ENDIF


IF (Years.Service >= 9) and (Years.Service < 9.25)
    If random.f(RetSeed) > .9796

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
      Endif
ENDIF


IF (Years.Service >= 10) and (Years.Service <10.25)
    If random.f(RetSeed) > .9735

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
      Endif
ENDIF


IF (Years.Service >= 11) and (Years.Service <11.25)
    If random.f(RetSeed) > .9926

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
```

```
        Loop

    Remove PILOT from CONUS
  Endif
ENDIF

IF (Years.Service >= 12) and (Years.Service <12.25)
  If random.f(RetSeed) > .9881

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

    Remove PILOT from CONUS
  Endif
ENDIF

IF (Years.Service >= 13) and (Years.Service <13.25)
  If random.f(RetSeed) > .9405

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

    Remove PILOT from CONUS
  Endif
ENDIF

IF (Years.Service >= 14) and (Years.Service <14.25)
  If random.f(RetSeed) > .9277

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

    Remove PILOT from CONUS
  Endif
ENDIF

IF (Years.Service >= 15) and (Years.Service <15.25)
```

```
If random.f(RetSeed) > .9483

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 16) and (Years.Service <16.25)
    If random.f(RetSeed) > .9575

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 17) and (Years.Service <17.25)
    If random.f(RetSeed) > 1.0

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 18) and (Years.Service <18.25)
    If random.f(RetSeed) > .8597

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
```

```
                    File ASSIGNMENT in UNFILLED
                 Endif
              Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 19) and (Years.Service <19.25)
   If random.f(RetSeed) > .9500

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
              Endif
            Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 21) and (Years.Service <21.25)
   If random.f(RetSeed) > .6944

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
              Endif
            Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 22) and (Years.Service <22.25)
   If random.f(RetSeed) > .8033

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
              Endif
            Loop

        Remove PILOT from CONUS
      Endif
```

```
ENDIF

IF (Years.Service >= 23) and (Years.Service <23.25)
   If random.f(RetSeed) > .3913

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
           If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
           Endif
         Loop

       Remove PILOT from CONUS
     Endif
ENDIF

IF Years.Service >= 24
   If random.f(RetSeed) > .7826

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
           If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
           Endif
         Loop

       Remove PILOT from CONUS
     Endif
ENDIF

IF Years.Service >= 27
     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
           If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
           Endif
         Loop

     IF Pilot is in Conus
       Remove PILOT from CONUS
     Endif
ENDIF

LOOP
```

For Every PILOT of OVERSEAS with WEAPON = "F15" ''—For each F15 pilot in Overseas do a
''— random draw to see is pilot is retented based
''— on commissioned years of service retention rate

DO

IF (Years.Service >= 4) and (Years.Service <4.25)
  If random.f(RetSeed) > 1.0

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
       Do
        If Assignment is in Filled
         Remove ASSIGNMENT from FILLED
         File ASSIGNMENT in UNFILLED
         Endif
       Loop

     Remove PILOT from OVERSEAS
  Endif
ENDIF

IF (Years.Service >= 5) and (Years.Service <5.25)
  If random.f(RetSeed) > 1.0

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
       Do
        If Assignment is in Filled
         Remove ASSIGNMENT from FILLED
         File ASSIGNMENT in UNFILLED
         Endif
       Loop

     Remove PILOT from OVERSEAS
  Endif

ENDIF

IF (Years.Service >= 6) and (Years.Service <6.25)
  If random.f(RetSeed) > 1.0

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
       Do
        If Assignment is in Filled
         Remove ASSIGNMENT from FILLED
         File ASSIGNMENT in UNFILLED
         Endif
       Loop

     Remove PILOT from OVERSEAS
  Endif
ENDIF

```
IF (Years.Service >= 7) and (Years.Service <7.25)
   If random.f(RetSeed) > 1.0

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
               Endif
             Loop

         Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 8) and (Years.Service <8.25)
   If random.f(RetSeed) > .9886

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
               Endif
             Loop

         Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 9) and (Years.Service <9.25)
   If random.f(RetSeed) > .9796

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
               Endif
             Loop

         Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 10) and (Years.Service <10.25)
   If random.f(RetSeed) > .9427

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
```

```
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >=11) and (Years.Service <11.25)
    If random.f(RetSeed) > .9926

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 12) and (Years.Service <12.25)
    If random.f(RetSeed) > .9881

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 13) and (Years.Service <13.25)
    If random.f(RetSeed) > .9405

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
```

ENDIF

IF (Years.Service >= 14) and (Years.Service <14.25)
    If random.f(RetSeed) > .9277

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                    If Assignment is in Filled
                        Remove ASSIGNMENT from FILLED
                        File ASSIGNMENT in UNFILLED
                    Endif
                Loop

        Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 15) and (Years.Service <15.25)
    If random.f(RetSeed) > .9483

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                    If Assignment is in Filled
                        Remove ASSIGNMENT from FILLED
                        File ASSIGNMENT in UNFILLED
                    Endif
                Loop

        Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 16) and (Years.Service <16.25)
    If random.f(RetSeed) > .9575

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                    If Assignment is in Filled
                        Remove ASSIGNMENT from FILLED
                        File ASSIGNMENT in UNFILLED
                    Endif
                Loop

        Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 17) and (Years.Service <17.25)
    If random.f(RetSeed) > 1.0

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN

```
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop


      Remove PILOT from OVERSEAS
    Endif
ENDIF


IF (Years.Service >= 18) and (Years.Service <18.25)
    If random.f(RetSeed) > .8597


     "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
           Endif
         Loop


      Remove PILOT from OVERSEAS
    Endif
ENDIF


IF (Years.Service >= 19) and (Years.Service <19.25)
    If random.f(RetSeed) > .9500
     "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
           Endif
         Loop


      Remove PILOT from OVERSEAS
    Endif
ENDIF


IF (Years.Service >= 21) and (Years.Service <21.25)
    If random.f(RetSeed) > .6944


     "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
           Endif
         Loop


      Remove PILOT from OVERSEAS
```

```
        Endif
ENDIF

IF (Years.Service >= 22) and (Years.Service <22.25)
   If random.f(RetSeed) > .8033

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
              Endif
           Loop

      Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 23) and (Years.Service <23.25)
   If random.f(RetSeed) > .3913

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
              Endif
           Loop

      Remove PILOT from OVERSEAS
      Endif
ENDIF

IF Years.Service >= 24
   If random.f(RetSeed) > .7826

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
              Endif
           Loop

      Remove PILOT from OVERSEAS
      Endif
ENDIF

IF Years.Service >= 27
      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
           Do
```

```
                If Assignment is in Filled
                  Remove ASSIGNMENT from FILLED
                  File ASSIGNMENT in UNFILLED
                Endif
              Loop

              IF Pilot is in Overseas
          Remove PILOT from OVERSEAS
            Endif
      ENDIF


    LOOP


For Every PILOT of UNASSIGNED with WEAPON = "F15" ''—For each F15 pilot in Overseas do a
                                                  ''— random draw to see is pilot is retented based
                                                  ''— on commissioned years of service retention rate
    DO

    IF (Years.Service >= 4) and (Years.Service <4.25)
       If random.f(RetSeed) > 1.0

         "---- remove from assignment list----
           For Each ASSIGNMENT with OFFICER = SSN
             Do
               If Assignment is in Filled
                 Remove ASSIGNMENT from FILLED
                 File ASSIGNMENT in UNFILLED
               Endif
             Loop

         Remove PILOT from UNASSIGNED
       Endif
    ENDIF

    IF (Years.Service >= 5) and (Years.Service <5.25)
       If random.f(RetSeed) > 1.0

         "---- remove from assignment list----
           For Each ASSIGNMENT with OFFICER = SSN
             Do
               If Assignment is in Filled
                 Remove ASSIGNMENT from FILLED
                 File ASSIGNMENT in UNFILLED
               Endif
             Loop

         Remove PILOT from UNASSIGNED
       Endif

    ENDIF

    IF (Years.Service >= 6) and (Years.Service <6.25)
       If random.f(RetSeed) > 1.0
```

```
       "---- remove from assignment list----
          For Each ASSIGNMENT with OFFICER = SSN
            Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
             Endif
            Loop

          Remove PILOT from UNASSIGNED
       Endif
ENDIF

IF (Years.Service >= 7) and (Years.Service <7.25)
   If random.f(RetSeed) > 1.0

       "---- remove from assignment list----
          For Each ASSIGNMENT with OFFICER = SSN
            Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
             Endif
            Loop

          Remove PILOT from UNASSIGNED
       Endif
ENDIF

IF (Years.Service >= 8) and (Years.Service <8.25)
   If random.f(RetSeed) > .9886

       "---- remove from assignment list----
          For Each ASSIGNMENT with OFFICER = SSN
            Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
             Endif
            Loop

          Remove PILOT from UNASSIGNED
       Endif
ENDIF

IF (Years.Service >= 9) and (Years.Service <9.25)
   If random.f(RetSeed) > .9796

       "---- remove from assignment list----
          For Each ASSIGNMENT with OFFICER = SSN
            Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
             Endif
```

```
            Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 10) and (Years.Service <10.25)
    If random.f(RetSeed) > .9427

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 11) and (Years.Service <11.25)
    If random.f(RetSeed) > .9926

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 12) and (Years.Service <12.25)
    If random.f(RetSeed) > .9881

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 13) and (Years.Service <13.25)
```

```
If random.f(RetSeed) > .9405

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
         Endif
        Loop

      Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 14) and (Years.Service <14.25)
   If random.f(RetSeed) > .9277

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
         Endif
        Loop

      Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 15) and (Years.Service <15.25)
   If random.f(RetSeed) > .9483

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
         Endif
        Loop

      Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 16) and (Years.Service <16.25)
   If random.f(RetSeed) > .9575

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
```

```
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from UNASSIGNED
  Endif
ENDIF

IF (Years.Service >= 17) and (Years.Service <17.25)
  If random.f(RetSeed) > 1.0

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from UNASSIGNED
  Endif
ENDIF

IF (Years.Service >= 18) and (Years.Service <18.25)
  If random.f(RetSeed) > .8597

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

    Remove PILOT from UNASSIGNED
  Endif
ENDIF

IF (Years.Service >= 19) and (Years.Service <19.25)
  If random.f(RetSeed) > .9500

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from UNASSIGNED
  Endif
ENDIF
```

```
IF (Years.Service >= 21) and (Years.Service <21.25)
   If random.f(RetSeed) > .6944

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
           If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
           Endif
         Loop

     Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 22) and (Years.Service <22.25)
   If random.f(RetSeed) > .8033

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
           If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
           Endif
         Loop

     Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 23) and (Years.Service <23.25)
   If random.f(RetSeed) > .3913

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
           If Assignment is in Filled
             Remove ASSIGNMENT from FILLED
             File ASSIGNMENT in UNFILLED
           Endif
         Loop

     Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF Years.Service >= 24
   If random.f(RetSeed) > .7826

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
```

```
                If Assignment is in Filled
                  Remove ASSIGNMENT from FILLED
                  File ASSIGNMENT in UNFILLED
                Endif
              Loop
           Remove PILOT from UNASSIGNED
        Endif
    ENDIF

    IF Years.Service >= 27
       "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
           Do
             If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
             Endif
           Loop
         IF Pilot is in Unassigned
          Remove PILOT from Unassigned
         Endif
     ENDIF
   LOOP
End
```

Routine Retent16   ''—Routine to see if F16 pilot is retented

```
Count = 0
"-- secton to ensure that major with 20 years of service are retired--
''—Find the number of majors with 2o years of service

For every Pilot of Conus with Weapon = "F16"
  Do
    IF (YEARS.SERVICE >= 20) and (YEARS.SERVICE < 20.25)
    Count = Count + 1
    File Pilot in Twenty
    Endif
  Loop

For every Pilot of Overseas with Weapon ="F16"
  Do
    IF (YEARS.SERVICE >= 20) and (YEARS.SERVICE < 20.25)
    Count = Count + 1
    File Pilot in Twenty
    Endif
  Loop

For every Pilot of Unassigned with Weapon ="F16"
  Do
    IF (YEARS.SERVICE >= 20) and (YEARS.SERVICE < 20.25)
    Count = Count + 1
    File Pilot in Twenty
    Endif
  Loop

Count = trunc.f(count*(1-.9105))  "-- determine number to remove from service


  For every Pilot of twenty
    Do  "--- loop to remove all majors with 20 years of service
      If Grade = 4
        Remove Pilot from Twenty
        If Pilot is in Conus
          Remove Pilot from Conus
        Endif
        If Pilot is in Overseas
          Remove Pilot from Overseas
        Endif

        If Pilot is in Unassigned
          Remove Pilot from Unassigned
        Endif

        For Each ASSIGNMENT with OFFICER = SSN''--Put all removed pilots assignment in to
          Do                                      ''—set of unfilled assignments
            If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
            Endif
          Loop
```

```
            Count = Count-1
        Endif
    Loop

For EAch Pilot of Twenty,While Count > 0  ''—If after removing majors have removed less pilots that
    Do                                     ''—retention factor would keep removing 20 year pilots
        REmove Pilot from Twenty
        If Pilot is in Conus
            Remove Pilot from Conus
        Endif
        If Pilot is in Overseas
            Remove Pilot from Overseas
        Endif
        IF Pilot is in Unassigned
            Remove Pilot from Unassigned
        ENDIF

        For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
              Endif
            Loop

        Count = Count-1
    Loop

For Every Pilot of Twenty
    Remove Pilot from Twenty




for Every PILOT of CONUS with WEAPON = "F16"  ''—For each F16 pilot in CONUS do a
                                              ''— random draw to see is pilot is retented based
                                              ''— on commissioned years of service retention rate
    DO

    IF (Years.Service >= 4) and (Years.Service < 4.25)
        If random.f(RetSeed) > 1.0

          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                  If Assignment is in Filled
                    Remove ASSIGNMENT from FILLED
                    File ASSIGNMENT in UNFILLED
                  Endif
                Loop

            Remove PILOT from CONUS
        Endif
    ENDIF
```

```
IF (Years.Service >= 5) and (Years.Service < 5.25)
   If random.f(RetSeed) > 1.0

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

      Remove PILOT from CONUS
   Endif

ENDIF

IF (Years.Service >= 6) and (Years.Service < 6.25)
   If random.f(RetSeed) > 1.0

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

      Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 7) and (Years.Service < 7.25)
   If random.f(RetSeed) > 1.0

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

      Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 8) and (Years.Service < 8.25)
   If random.f(RetSeed) > .9886

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
```

```
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
         Loop

      Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 9) and (Years.Service < 9.25)
   If random.f(RetSeed) > .9796

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
         Loop

      Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 10) and (Years.Service < 10.25)
   If random.f(RetSeed) > .9735

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
         Loop

      Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 11) and (Years.Service < 11.25)
   If random.f(RetSeed) > .9926

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
         Loop
```

```
            Remove PILOT from CONUS
        Endif
ENDIF

IF (Years.Service >= 12) and (Years.Service < 12.25)
    If random.f(RetSeed) > .9881

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 13) and (Years.Service < 13.25)
    If random.f(RetSeed) > .9405

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 14) and (Years.Service < 14.25)
    If random.f(RetSeed) > .9277

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
    Endif
ENDIF

IF (Years.Service >= 15) and (Years.Service < 15.25)
    If random.f(RetSeed) > .9483
```

```
"---- remove from assignment list----
   For Each ASSIGNMENT with OFFICER = SSN
     Do
       If Assignment is in Filled
         Remove ASSIGNMENT from FILLED
         File ASSIGNMENT in UNFILLED
       Endif
     Loop

   Remove PILOT from CONUS
 Endif
ENDIF

IF (Years.Service >= 16) and (Years.Service < 16.25)
  If random.f(RetSeed) > .9575

   "---- remove from assignment list----
     For Each ASSIGNMENT with OFFICER = SSN
       Do
         If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
         Endif
       Loop

     Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 17) and (Years.Service < 17.25)
  If random.f(RetSeed) > 1.0

   "---- remove from assignment list----
     For Each ASSIGNMENT with OFFICER = SSN
       Do
         If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
         Endif
       Loop

     Remove PILOT from CONUS
   Endif
ENDIF

IF (Years.Service >= 18) and (Years.Service < 18.25)
  If random.f(RetSeed) > .8597

   "---- remove from assignment list----
     For Each ASSIGNMENT with OFFICER = SSN
       Do
         If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
         Endif
```

```
              Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 19) and (Years.Service < 19.25)
    If random.f(RetSeed) > .9500

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 21) and (Years.Service < 21.25)
    If random.f(RetSeed) > .6944

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 22) and (Years.Service < 22.25)
    If random.f(RetSeed) > .8033

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from CONUS
      Endif
ENDIF

IF (Years.Service >= 23) and (Years.Service < 23.25)
```

```
        If random.f(RetSeed) > .3913

          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
              Do
                If Assignment is in Filled
                  Remove ASSIGNMENT from FILLED
                  File ASSIGNMENT in UNFILLED
                  ENDIF
                Loop

            Remove PILOT from CONUS
          Endif
      ENDIF

      IF Years.Service >= 24
        If random.f(RetSeed) > .7826

          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
              Do
                If Assignment is in Filled
                  Remove ASSIGNMENT from FILLED
                  File ASSIGNMENT in UNFILLED
                  Endif
                Loop

            Remove PILOT from CONUS
          Endif
      ENDIF

      IF Years.Service >= 27
          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
              Do
                If Assignment is in Filled
                  Remove ASSIGNMENT from FILLED
                  File ASSIGNMENT in UNFILLED
                  Endif
                Loop

          IF Pilot is in Conus
            Remove PILOT from CONUS
          Endif
      ENDIF

  LOOP

  for Every PILOT of OVERSEAS with WEAPON = "F16" ''—For each F16 pilot in Overseas do a
                                        ''— random draw to see is pilot is retented based
                                        ''— on commissioned years of service retention rate


  DO
```

73

```
IF (Years.Service >= 4) and (Years.Service < 4.25)
   If random.f(RetSeed) > 1.0

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
           Endif
         Loop

     Remove PILOT from OVERSEAS
   Endif
ENDIF

IF (Years.Service >= 5) and (Years.Service < 5.25)
   If random.f(RetSeed) > 1.0

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
           Endif
         Loop

     Remove PILOT from OVERSEAS
   Endif

ENDIF

IF (Years.Service >= 6) and (Years.Service < 6.25)
   If random.f(RetSeed) > 1.0

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
           Endif
         Loop

     Remove PILOT from OVERSEAS
   Endif
ENDIF

IF (Years.Service >= 7) and (Years.Service < 7.25)
   If random.f(RetSeed) > 1.0

     "---- remove from assignment list----
       For Each ASSIGNMENT with OFFICER = SSN
         Do
```

```
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

     Remove PILOT from OVERSEAS
   Endif
ENDIF

IF (Years.Service >= 8) and (Years.Service < 8.25)
   If random.f(RetSeed) > .9886

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

     Remove PILOT from OVERSEAS
   Endif
ENDIF

IF (Years.Service >= 9) and (Years.Service < 9.25)
   If random.f(RetSeed) > .9796

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
         Loop

     Remove PILOT from OVERSEAS
   Endif
ENDIF

IF (Years.Service >= 10) and (Years.Service < 10.25)
   If random.f(RetSeed) > .9735

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
         Loop

   Remove PILOT from OVERSEAS
```

```
        Endif
ENDIF

IF (Years.Service >= 11) and (Years.Service < 11.25)
   If random.f(RetSeed) > .9926

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
               Endif
            Loop

         Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 12) and (Years.Service < 12.25)
   If random.f(RetSeed) > .9881

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
               Endif
            Loop

         Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 13) and (Years.Service < 13.25)
   If random.f(RetSeed) > .9405

      "---- remove from assignment list----
         For Each ASSIGNMENT with OFFICER = SSN
            Do
              If Assignment is in Filled
               Remove ASSIGNMENT from FILLED
               File ASSIGNMENT in UNFILLED
               Endif
            Loop

         Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 14) and (Years.Service < 14.25)
   If random.f(RetSeed) > .9277

      "---- remove from assignment list----
```

```
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 15) and (Years.Service < 15.25)
    If random.f(RetSeed) > .9783

    "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 16) and (Years.Service < 16.25)
    If random.f(RetSeed) > .9575

    "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 17) and (Years.Service < 17.25)
    If random.f(RetSeed) > 1.0

    "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop
```

```
        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF (Years.Service >= 18) and (Years.Service < 18.25)
    If random.f(RetSeed) > .8597

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 19) and (Years.Service < 19.25)
    If random.f(RetSeed) > .9500

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 21) and (Years.Service < 21.25)
    If random.f(RetSeed) > .6944

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
         If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

      Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 22) and (Years.Service < 22.25)
    If random.f(RetSeed) > .8033
```

```
"---- remove from assignment list----
    For Each ASSIGNMENT with OFFICER = SSN
      Do
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
        Endif
      Loop

      Remove PILOT from OVERSEAS
    Endif
ENDIF

IF (Years.Service >= 23) and (Years.Service < 23.25)
    If random.f(RetSeed) > .3913

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          ENDIF
        Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF Years.Service >= 24
    If random.f(RetSeed) > .7826

    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop

        Remove PILOT from OVERSEAS
      Endif
ENDIF

IF Years.Service >= 27
    "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
        Do
          If Assignment is in Filled
            Remove ASSIGNMENT from FILLED
            File ASSIGNMENT in UNFILLED
          Endif
        Loop
```

```
           IF Pilot is in OVERSEAS
            Remove PILOT from Overseas
           Endif
     ENDIF


 LOOP

 for Every PILOT of UNASSIGNED with WEAPON = "F16" ''—For each F15 pilot in Unassigned do a
                                                   ''— random draw to see is pilot is retented based
                                                   ''— on commissioned years of service retention rate



     DO

     IF (Years.Service >= 4) and (Years.Service < 4.25)
        If random.f(RetSeed) > 1.0

          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
              Do
               If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
               Endif
              Loop

          Remove PILOT from UNASSIGNED
        Endif
     ENDIF

     IF (Years.Service >= 5) and (Years.Service < 5.25)
        If random.f(RetSeed) > 1.0

          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
              Do
               If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
               Endif
              Loop

          Remove PILOT from UNASSIGNED
        Endif

     ENDIF

     IF (Years.Service >= 6) and (Years.Service < 6.25)
        If random.f(RetSeed) > 1.0

          "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
              Do
               If Assignment is in Filled
```

80

```
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
              Endif
            Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 7) and (Years.Service < 7.25)
    If random.f(RetSeed) > 1.0

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 8) and (Years.Service < 8.25)
    If random.f(RetSeed) > .9886

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF

IF (Years.Service >= 9) and (Years.Service < 9.25)
    If random.f(RetSeed) > .9796

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
```

```
ENDIF

IF (Years.Service >= 10) and (Years.Service < 10.25)
   If random.f(RetSeed) > .9735

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
          Endif
         Loop

      Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 11) and (Years.Service < 11.25)
   If random.f(RetSeed) > .9926

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
          Endif
         Loop

      Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 12) and (Years.Service < 12.25)
   If random.f(RetSeed) > .9881

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
         Do
          If Assignment is in Filled
           Remove ASSIGNMENT from FILLED
           File ASSIGNMENT in UNFILLED
          Endif
         Loop

      Remove PILOT from UNASSIGNED
   Endif
ENDIF

IF (Years.Service >= 13) and (Years.Service < 13.25)
   If random.f(RetSeed) > .9405

   "---- remove from assignment list----
      For Each ASSIGNMENT with OFFICER = SSN
```

```
            Do
              If Assignment is in Filled
                Remove ASSIGNMENT from FILLED
                File ASSIGNMENT in UNFILLED
              Endif
            Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF


IF (Years.Service >= 14) and (Years.Service < 14.25)
    If random.f(RetSeed) > .9277

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF


IF (Years.Service >= 15) and (Years.Service < 15.25)
    If random.f(RetSeed) > .9483

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop

        Remove PILOT from UNASSIGNED
      Endif
ENDIF


IF (Years.Service >= 16) and (Years.Service < 16.25)
    If random.f(RetSeed) > .9575

      "---- remove from assignment list----
        For Each ASSIGNMENT with OFFICER = SSN
          Do
            If Assignment is in Filled
              Remove ASSIGNMENT from FILLED
              File ASSIGNMENT in UNFILLED
            Endif
          Loop
```

```
            Remove PILOT from UNASSIGNED
        Endif
ENDIF

IF (Years.Service >= 17) and (Years.Service < 17.25)
    If random.f(RetSeed) > 1.0

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                    If Assignment is in Filled
                        Remove ASSIGNMENT from FILLED
                        File ASSIGNMENT in UNFILLED
                    Endif
                Loop

            Remove PILOT from UNASSIGNED
        Endif
ENDIF

IF (Years.Service >= 18) and (Years.Service < 18.25)
    If random.f(RetSeed) > .8597

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                    If Assignment is in Filled
                        Remove ASSIGNMENT from FILLED
                        File ASSIGNMENT in UNFILLED
                    Endif
                Loop

        Remove PILOT from UNASSIGNED
        Endif
ENDIF

IF (Years.Service >= 19) and (Years.Service < 19.25)
    If random.f(RetSeed) > .9500

        "---- remove from assignment list----
            For Each ASSIGNMENT with OFFICER = SSN
                Do
                    If Assignment is in Filled
                        Remove ASSIGNMENT from FILLED
                        File ASSIGNMENT in UNFILLED
                    Endif
                Loop

        Remove PILOT from UNASSIGNED
        Endif
ENDIF

IF (Years.Service >= 21) and (Years.Service < 21.25)
    If random.f(RetSeed) > .6944
```

```
"---- remove from assignment list----
   For Each ASSIGNMENT with OFFICER = SSN
     Do
      If Assignment is in Filled
        Remove ASSIGNMENT from FILLED
        File ASSIGNMENT in UNFILLED
        Endif
      Loop

   Remove PILOT from UNASSIGNED
  Endif
ENDIF

IF (Years.Service >= 22) and (Years.Service < 22.25)
   If random.f(RetSeed) > .8033

   "---- remove from assignment list----
     For Each ASSIGNMENT with OFFICER = SSN
       Do
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
        Loop

     Remove PILOT from UNASSIGNED
    Endif
ENDIF

IF (Years.Service >= 23) and (Years.Service < 23.25)
   If random.f(RetSeed) > .3913

   "---- remove from assignment list----
     For Each ASSIGNMENT with OFFICER = SSN
       Do
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          ENDIF
        Loop

     Remove PILOT from UNASSIGNED
    Endif
ENDIF

IF Years.Service >= 24
   If random.f(RetSeed) > .7826

   "---- remove from assignment list----
     For Each ASSIGNMENT with OFFICER = SSN
       Do
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
          Endif
```

```
            Loop

        Remove PILOT from UNASSIGNED
    Endif
ENDIF

IF Years.Service >= 27
    "---- remove from assignment list----
    For Each ASSIGNMENT with OFFICER = SSN
      Do
        If Assignment is in Filled
          Remove ASSIGNMENT from FILLED
          File ASSIGNMENT in UNFILLED
        Endif
      Loop

    IF Pilot is in Unassigned
     Remove PILOT from Unassigned
    Endif
ENDIF

LOOP

End
```

Routine Promotion   ''—Does promotions to major and Lt Col

For each PILOT of CONUS with Grade = 3   "-- Major Board
do
   If (trunc.f(DATE.OF.RANK + 7.0) - trunc.f(DATE) <= 0)
"--- 100% promotion to Major, using retention rates to reflect actual promotion rates
         GRADE = 4
         DATE.OF.RANK = DATE
   Endif

loop

For each PILOT of CONUS with Grade = 4   "-- Lt Col Board
do
   If trunc.f(DATE.OF.RANK + 5.0) - trunc.f(DATE) = 0
"--- random draw for in zone promotion IF STATEMENT
      Then If uniform.f(0.0,1.0,LtColSeed) < .7235 ''—Promotion rate from historical data
         GRADE = 5
         DATE.OF.RANK = DATE
   Endif

   If trunc.f(DATE.OF.RANK + 5.0) - trunc.f(DATE) < 0
"__random draw for above zone promotion
      Then If uniform.f(0.0,1.0,LtColSeed) < .030875   ''—Promotion rate from historical data
         GRADE = 5
         DATE.OF.RANK = DATE
   Endif

loop

For each PILOT of OVERSEAS with Grade = 3   "-- Major Board
do
   If (trunc.f(DATE.OF.RANK + 7.0) - trunc.f(DATE) <= 0)
"--- 100% promotion to Major, using retention rates to reflect actual promotion rates
         GRADE = 4
         DATE.OF.RANK = DATE
   Endif
loop

For each PILOT of OVERSEAS with Grade = 4   "-- Lt Col Board
do
   If trunc.f(DATE.OF.RANK + 5.0) - trunc.f(DATE) = 0
"--- random draw for in zone promotion IF STATEMENT
      Then If uniform.f(0.0,1.0,LtColSeed) < .7235 ''—Promotion rate from historical data
         GRADE = 5
         DATE.OF.RANK = DATE
   Endif
   If trunc.f(DATE.OF.RANK + 5.0) - trunc.f(DATE) < 0
"__random draw for above zone promotion
      Then If uniform.f(0.0,1.0,LtColSeed) < .030875   ''—Promotion rate from historical data
         GRADE = 5
         DATE.OF.RANK = DATE
   Endif

loop

```
For each PILOT of Unassigned with Grade = 3    "-- Major Board
do

    If (trunc.f(DATE.OF.RANK + 7.0) - trunc.f(DATE) <= 0)
"--- 100% promotion to Major, using retention rates to reflect actual promotion rates
        GRADE = 4
        DATE.OF.RANK = DATE
    Endif

loop

For each PILOT of Unassigned with Grade = 4    "-- Lt Col Board
do
    If trunc.f(DATE.OF.RANK + 5.0) - trunc.f(DATE) = 0
"--- random draw for in zone promotion IF STATEMENT
        Then If uniform.f(0.0,1.0,LtColSeed) < .7235   "—Promotion rate from historical data
        GRADE = 5
        DATE.OF.RANK = DATE
    Endif

    If trunc.f(DATE.OF.RANK + 5.0) - trunc.f(DATE) < 0
"__random draw for above zone promotion
        Then If uniform.f(0.0,1.0,LtColSeed) < .030875   "—Promotion rate from historical data
        GRADE = 5
        DATE.OF.RANK = DATE
    Endif

loop

end
```

Routine Procapt ''—Promotion procedures to 1st Lt and Capt

```
for Each Pilot of Conus with Grade = 1
 do
   If (DATE.OF.RANK + 2.0) <= DATE "-- 100% promotion to 1st Lt
      Grade = 2
      DATE.OF.RANK = Date
   Endif

 loop

for each Pilot of Conus with Grade = 2
 do
   IF (DATE.OF.RANK + 2.0) <= Date  "-- 100% to Capt
      Grade = 3
      Date.OF.RAnk = DATE
   EndIF

 Loop

for Each Pilot of OVERSEAS with Grade = 1
 do
   If (DATE.OF.RANK + 2.0) <= DATE "-- 100% promotion to 1st Lt
      Grade = 2
      DATE.OF.RANK = Date
   Endif

 loop

for each Pilot of OVERSEAS with Grade = 2
 do
   IF (DATE.OF.RANK + 2.0) <= Date  "-- 100% to Capt
      Grade = 3
      Date.Of.Rank = DATE
   EndIF

 Loop

for Each Pilot of Unassigned with Grade = 1
 do
   If (DATE.OF.RANK + 2.0) <= DATE "-- 100% promotion to 1st Lt
      Grade = 2
      DATE.OF.RANK = Date
   Endif
 loop

for each Pilot of Unassigned with Grade = 2
 Do
   IF (DATE.OF.RANK + 2.0) <= Date  "-- 100% to Capt
      Grade = 3
      Date.Of.Rank = DATE
   Endif
 Loop
End
```

Routine Assign ''—Routine that accomplishes assigned

For Each PILOT of CONUS with MOVE.DATE <= DATE "-- determines pilots who must PCS
  Do

    For Each ASSIGNMENT of FILLED with OFFICER = SSN(PILOT)
      DO ''—For each pilot who is Pcsing move that assignment from filled to unfilled
        Remove ASSIGNMENT from FILLED
        File ASSIGNMENT in UNFILLED
        FILE PILOT in UNASSIGNED
        Remove Pilot from CONUS
      LOOP

  Loop

For Each PILOT of OVERSEAS with MOVE.DATE <= DATE "-- determines pilots who must PCS
  Do

    For Each ASSIGNMENT of FILLED with OFFICER = SSN(PILOT)
      DO
        Remove ASSIGNMENT from FILLED
        File ASSIGNMENT in UNFILLED
        FILE PILOT in UNASSIGNED
        Remove PILOT from OVERSEAS
      LOOP

  Loop

''—changing the order of the following routines changes assignment priorities
Call UPTGrad   ''—call routine to get RTU grads into system
Call CCAsgn ''—call routine to assign command slots
Call OPSAsgn ''—call routine to assign operation unit slots
Call FTAsgn   ''—call routine to assign Formal Training IP slots
Call ALOAsgn ''—call routine to assign ALO slots
Call SCHAsgn ''—call routine to assign school slots
Call STFAsgn ''—call routine to assign staff slots

end

Routine UPTGrad ''—routines that inputs RTU grads into simulation

ID = trunc.f(1000*(date-1900))
I=1

IF Trunc.f(date) <= 1996
  while I <= 37 ''—Input 37 new F16 pilots each quarter of 1996
    DO
     SSN(Dummy) = ID + I
     GRADE(Dummy)= 1
     YEARS.SERVICE(DUMMY) = 1.75
     DATE.OF.RANK(DUMMY) = DATE - 1.75
     Weapon(DUMMY) = "F16"
     Gate.Time(DUMMY) = 1.75
     FLYING.NOW(DUMMY) = 1
     F16.Hours(Dummy) = 80.0
     F.HOURS(DummY) = 80.0
     Total.Hours(DUMMY) = 80.0

    For each Assignment of Unfilled with Name ="F16OPS"
    DO ''—Place F16 pilots into unfilled operational assignments
     ASSGN(Dummy)=Name
     LOCATION(dummy) = LOC
     DATE.ARRIVED(Dummy) = Date
     OFFICER = SSN(Dummy)
     OPS(DummY) = 1
     Remove Assignment from UNFILLED
     File Assignment in Filled
    Leave
    LOOP

    ''-- If not enough unfilled operational assignment remove pilots with over 10 years of
    ''-- gate time from operational assignment. 50-50 chance remove from CONUS or Overseas
IF ASSGN(DUMMY) ne "F16OPS" and random.f(uptseed) <.5
    FOR EACH PILOT of CONUS with ASSGN ="F16OPS"
     DO
      IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
       File PILOT in UNASSIGNED
       IF LOCATION = "CONUS"
        REMOVE PILOT FROM CONUS
       ENDIF
       IF LOCATION ="OVERSEAS"
        REMOVE PILOT FROM OVERSEAS
       ENDIF
      FOR each Assignment with OFFICER = SSN
       Do
        ASSGN(Dummy)=Name
        LOCATION(dummy) = LOC
        DATE.ARRIVED(Dummy) = Date
        OFFICER = SSN(Dummy)
        OPS(DummY) = 1
       Loop
       LEAVE
      EndIf

```
            LOOP


    ELSE IF ASSGN(DUMMY) ne "F16OPS"
       FOR EACH PILOT of OVERSEAS with ASSGN ="F16OPS"
          DO
           IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
             File PILOT in UNASSIGNED
             IF LOCATION = "CONUS"
                REMOVE PILOT FROM CONUS
             ENDIF
             IF LOCATION ="OVERSEAS"
                 REMOVE PILOT FROM OVERSEAS
             ENDIF
          FOR  each Assignment with OFFICER = SSN
              Do
               ASSGN(Dummy)=Name
               LOCATION(dummy) = LOC
               DATE.ARRIVED(Dummy) = Date
               OFFICER = SSN(Dummy)
               OPS(DummY) = 1
             Loop
             LEAVE
           ENDIF
          LOOP
     ENDIF
  Endif

'' —loop to calculate must move date for new pilots
    IF LOCATION(DUMMY) = "CONUS"
        FILE DUMMY in CONUS
        MOVE.DATE(DUMMY)= DATE + TOS.RULE
     ELSE IF LOCATION(DUMMY) = "OVERSEAS"
        FILE DUMMY in OVERSEAS
        MOVE.DATE(DUMMY) = DATE + 3.0
    always
    always



    Dummy = dummy + 1
    i = I+1
  LOOP

while I <=69  '' —Inputs 32 F15 pilots into system each quarter of 1996
    DO
    SSN(Dummy) = ID + I
    GRADE(Dummy)= 1
    YEARS.SERVICE(DUMMY) = 1.75
    DATE.OF.RANK(DUMMY) = DATE - 1.75
    Weapon(DUMMY) = "F15"
    Gate.Time(DUMMY) = 1.75
    FLYING.NOW(DUMMY) = 1
    F15.Hours(Dummy) = 80.0
    F.HOURS(DummY) = 80.0
```

```
Total.Hours(DUMMY) = 80.0

For each Assignment of Unfilled with Name ="F15OPS"
 DO ''—Place F15 pilots into unfilled operational assignments
  ASSGN(Dummy)=Name
  LOCATION(dummy) = LOC
  DATE.ARRIVED(Dummy) = Date
  OFFICER = SSN(Dummy)
  OPS(DummY) = 1
  Remove Assignment from UNFILLED
  File Assignment in Filled
  Leave
 LOOP




IF ASSGN(DUMMY) ne "F15OPS"  and random.f(uptseed) <.5
    FOR EACH PILOT of CONUS with ASSGN ="F15OPS"
       DO
         IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
           File PILOT in UNASSIGNED
           IF LOCATION = "CONUS"
             REMOVE PILOT FROM CONUS
           ENDIF
           IF LOCATION ="OVERSEAS"
              REMOVE PILOT FROM OVERSEAS
           ENDIF
         FOR  each Assignment with OFFICER = SSN
            Do
             ASSGN(Dummy)=Name
             LOCATION(dummy) = LOC
             DATE.ARRIVED(Dummy) = Date
             OFFICER = SSN(Dummy)
             OPS(DummY) = 1
            Loop
           LEAVE
         ENDIF
       LOOP

    ''-- If not enough unfilled operational assignment remove pilots with over 10 years of
    ''-- gate time from operational assignment.
Else IF ASSGN(DUMMY) ne "F15OPS"
    FOR EACH PILOT of OVERSEAS with ASSGN ="F15OPS"
       DO
         IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
           File PILOT in UNASSIGNED
           IF LOCATION = "CONUS"
             REMOVE PILOT FROM CONUS
           ENDIF
           IF LOCATION ="OVERSEAS"
              REMOVE PILOT FROM OVERSEAS
           ENDIF
        FOR  each Assignment with OFFICER = SSN
            Do
             ASSGN(Dummy)=Name
```

```
                LOCATION(dummy) = LOC
                DATE.ARRIVED(Dummy) = Date
                OFFICER = SSN(Dummy)
                OPS(DummY) = 1
            Loop
          LEAVE
        ENDIF
      LOOP
    ENDIF
Endif

''—loop to calculate must move date for new pilots
   IF LOCATION(DUMMY) = "CONUS"
       FILE DUMMY in CONUS
       MOVE.DATE(DUMMY)= DATE + TOS.RULE
     ELSE IF LOCATION(DUMMY) = "OVERSEAS"
       FILE DUMMY in OVERSEAS
       MOVE.DATE(DUMMY) = DATE + OS.Rule
   always
   always



   Dummy = dummy + 1
   i = I+1
  LOOP
endif

IF Trunc.f(date) >= 1997  ''—Loop for years greater than 1997
   while I <=39        ''—Input 39 new F16 pilots per quarter
    DO

    IF I < 9  "--9 FAIPS going to F16 each quarter and their data
     GRADE(Dummy)= 3
     YEARS.SERVICE(DUMMY) = 5.5
     DATE.OF.RANK(DUMMY) = DATE - 1.5
     Gate.Time(DUMMY) = 5.25
    Endif

    IF (I>=9) and (I <=13)  "—5 UPT Capts going to F16 and their data
     GRADE(Dummy)= 3
     Gate.Time(DUMMY) = 1.75
     IF random.f(uptseed) <.5  ''—50% have 5 years of service others 6 years
      YEARS.SERVICE(DUMMY) = 5.0
      DATE.OF.RANK(DUMMY) = DATE - 1.0
     Else
      YEARS.SERVICE(DUMMY) = 6.0
      DATE.OF.RANK(DUMMY) = DATE - 2.0
     Endif
    Endif

    IF I > 13  "-- UPT 1st assgn going to F16 and their data
     GRADE(Dummy)= 2
     YEARS.SERVICE(DUMMY) = 2.0
     DATE.OF.RANK(DUMMY) = DATE
```

```
  Gate.Time(DUMMY) = 1.75
Endif

SSN(Dummy) = ID + I
Weapon(DUMMY) = "F16"
FLYING.NOW(DUMMY) = 1
F16.Hours(Dummy) = 80.0
F.HOURS(DummY)  = 80.0
Total.Hours(DUMMY) = 80.0

For each Assignment of Unfilled with Name ="F16OPS"
 DO  ''—loop to place new F16 pilots in unfilled operational slots
   ASSGN(Dummy)=Name
   LOCATION(dummy) = LOC
   DATE.ARRIVED(Dummy) = Date
   OFFICER = SSN(Dummy)
   OPS(DummY) = 1
   Remove Assignment from UNFILLED
   File Assignment in Filled
  Leave
 LOOP


 ''—If no slots available remove pilots with over 10 years of gate time
 ''—50-50 chance of overseas or CONUS
IF ASSGN(DUMMY) ne "F16OPS" and random.f(uptseed) <.5
   FOR EACH PILOT of CONUS with ASSGN ="F16OPS"
      DO
        IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
          File PILOT in UNASSIGNED
          IF LOCATION = "CONUS"
            REMOVE PILOT FROM CONUS
          ENDIF
          IF LOCATION ="OVERSEAS"
            REMOVE PILOT FROM OVERSEAS
          ENDIF
        FOR  each Assignment with OFFICER = SSN
           Do
            ASSGN(Dummy)=Name
            LOCATION(dummy) = LOC
            DATE.ARRIVED(Dummy) = Date
            OFFICER = SSN(Dummy)
            OPS(Dummy) = 1
           Loop
          LEAVE
        ENDIF
      LOOP

Else IF ASSGN(DUMMY) ne "F16OPS"
   FOR EACH PILOT of OVERSEAS with ASSGN ="F16OPS"
      DO
        IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
          File PILOT in UNASSIGNED
          IF LOCATION = "CONUS"
            REMOVE PILOT FROM CONUS
```

95

```
                    ENDIF
                    IF LOCATION ="OVERSEAS"
                        REMOVE PILOT FROM OVERSEAS
                    ENDIF
               FOR  each Assignment with OFFICER = SSN
                    Do
                     ASSGN(Dummy)=Name
                     LOCATION(dummy) = LOC
                     DATE.ARRIVED(Dummy) = Date
                     OFFICER = SSN(Dummy)
                     OPS(Dummy) = 1
                    Loop
                    LEAVE
                  ENDIF
               LOOP
          ENDIF
     Endif

     ''—Input correct Must Move date for new pilots
        IF LOCATION(DUMMY) = "CONUS"
             FILE DUMMY in CONUS
             MOVE.DATE(DUMMY)= DATE + TOS.RULE
           ELSE IF LOCATION(DUMMY) = "OVERSEAS"
             FILE DUMMY in OVERSEAS
             MOVE.DATE(DUMMY) = DATE + OS.Rule
         always
         always




        Dummy = dummy + 1
         i = I+1
        LOOP

     while I <= 70
         DO  ''—Input 31 new F15 pilots into system
          IF I < 44  "—5  FAIPS going to F15 and their data
          GRADE(Dummy)= 3
          YEARS.SERVICE(DUMMY) = 5.5
          DATE.OF.RANK(DUMMY) = DATE - 1.5
          Gate.Time(DUMMY) = 5.25
          Endif

          IF (I>=45) and (I<=47)  "--3 UPT Capts going to F15 and their data
          GRADE(Dummy)= 3
          Gate.Time(DUMMY) = 1.75
          IF random.f(uptseed) <.5  ''—half  have 5 years of service others 6 years
           YEARS.SERVICE(DUMMY) = 5.0
           DATE.OF.RANK(DUMMY) = DATE - 1.0
           Else
           YEARS.SERVICE(DUMMY) = 6.0
           DATE.OF.RANK(DUMMY) = DATE - 2.0
          Endif
          Endif
```

```
IF I > 47  "-- UPT 1st assgn going to F15
 GRADE(Dummy)= 2
 YEARS.SERVICE(DUMMY) = 2.0
 DATE.OF.RANK(DUMMY) = DATE
 Gate.Time(DUMMY) = 1.75
Endif

SSN(Dummy) = ID + I
Weapon(DUMMY) = "F15"
FLYING.NOW(DUMMY) = 1
F15.Hours(Dummy) = 80.0
F.HOURS(DummY)  = 80.0
Total.Hours(DUMMY) = 80.0

For each Assignment of Unfilled with Name ="F15OPS"
 DO  ''—Input new F15 pilots into unfilled operational assignments
   ASSGN(Dummy)=Name
   LOCATION(dummy) = LOC
   DATE.ARRIVED(Dummy) = Date
   OFFICER = SSN(Dummy)
   OPS(DummY) = 1
   Remove Assignment from UNFILLED
   File Assignment in Filled
  Leave
 LOOP


''—If no unfillled operational slots remove pilots with over 10 years of gate time
''—50 50 chance of  Conus or Overseas assignment
IF ASSGN(DUMMY) ne "F15OPS" and random.f(uptseed) <.5
   FOR EACH PILOT of CONUS with ASSGN ="F15OPS"
      DO
       IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
         File PILOT in UNASSIGNED
         IF LOCATION = "CONUS"
           REMOVE PILOT FROM CONUS
         ENDIF
         IF LOCATION ="OVERSEAS"
            REMOVE PILOT FROM OVERSEAS
         ENDIF
      FOR  each Assignment with OFFICER = SSN
         Do
          ASSGN(Dummy)=Name
          LOCATION(dummy) = LOC
          DATE.ARRIVED(Dummy) = Date
          OFFICER = SSN(Dummy)
          OPS(Dummy) = 1
         Loop
         LEAVE
       ENDIF
      LOOP


Else IF ASSGN(DUMMY) ne "F15OPS"
```

```
    FOR EACH PILOT of OVERSEAS with ASSGN ="F15OPS"
      DO
        IF PILOT is not in UNASSIGNED and GATE.TIME >=10.0
          File PILOT in UNASSIGNED
          IF LOCATION = "CONUS"
            REMOVE PILOT FROM CONUS
          ENDIF
          IF LOCATION ="OVERSEAS"
             REMOVE PILOT FROM OVERSEAS
          ENDIF
        FOR  each Assignment with OFFICER = SSN
           Do
            ASSGN(Dummy)=Name
            LOCATION(dummy) = LOC
            DATE.ARRIVED(Dummy) = Date
            OFFICER = SSN(Dummy)
            OPS(DummY) = 1
           Loop
           LEAVE
         ENDIF
        LOOP
   ENDIF
Endif

''—Input correct Must Move date for New Pilots
   IF LOCATION(DUMMY) = "CONUS"
      FILE DUMMY in CONUS
      MOVE.DATE(DUMMY)= DATE + TOS.RULE
    ELSE IF LOCATION(DUMMY) = "OVERSEAS"
      FILE DUMMY in OVERSEAS
      MOVE.DATE(DUMMY) = DATE + OS.Rule
   always
   always



   Dummy = dummy + 1
   i = I+1
  LOOP
endif


end
```

Routine CCAsgn ''—Routine that does CC assignments

```
for each PILOT in UNASSIGNED
  DO  ''—Sorts pilots based on QCC rules in preamble
    File PILOT in QCC
    REMOVE PILOT from UNASSIGNED
  LOOP

For Each ASSIGNMENT in UNFILLED with NAME = "CC/OPS"
  DO
    FOR each PILOT in QCC
      Do
        IF (F.TYPE=WEAPON) or (F.TYPE = "Fighter")
            ''—Check to be sure pilot has correct weapon system to be commander

          IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
            COT = COT + 1
          ENDIF

          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + 2.0
          LOCATION = LOC
          FLYING.NOW = FLY
              CC = CC + 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QCC

''—File pilot in correct set Conus or Overseas
          IF LOCATION = "CONUS"
            FILE PILOT IN CONUS
            ELSE IF LOCATION = "OVERSEAS"
            FILE PILOT in OVERSEAS
          ALWAYS
          ALWAYS
        LEAVE

        ENDIF
      Loop

  LOOP


for each PILOT in QCC
  DO ''—Loop that clears out queue for Command for next quarter
    File PILOT in UNASSIGNED
    REMOVE PILOT from QCC
  LOOP

end
```

Routine OPSAsgn ''—Routine to fill operational assignments

```
for each PILOT in UNASSIGNED
  DO"—Sorts pilots based on QOPS rules in preamble
    File PILOT in QOPS
    REMOVE PILOT from UNASSIGNED
  LOOP

For Each Pilot in QOPS with LOCATION = "OVERSEAS"
 do ''—Pilots Overseas are assigned first to lower COTs
  For Each ASSIGNMENT in UNFILLED with NAME = "F15OPS"
   do ''—Assigns F15 overseas pilots to F15 Conus slots
    IF (WEAPON = "F15") and (LOC = "CONUS")
        ASSGN = NAME
        DATE.ARRIVED = DATE
        MOVE.DATE = DATE.ARRIVED + TOS.RULE
        LOCATION = LOC
        FLYING.NOW = FLY
        OPS = OPS + 1
        OFFICER = SSN
        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QOPS
        FILE PILOT in CONUS
      leave
    ENDIF

  loop

  For Each ASSIGNMENT in UNFILLED with NAME = "F16OPS"
   do ''—Assigns F16 overseas pilots to Conus Assignments
    IF (WEAPON = "F16") and (LOC = "CONUS")
        ASSGN = NAME
        DATE.ARRIVED = DATE
        MOVE.DATE = DATE.ARRIVED + TOS.RULE
        LOCATION = LOC
        FLYING.NOW = FLY
        OPS = OPS + 1
        OFFICER = SSN
        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QOPS
        FILE PILOT in CONUS
      leave
    ENDIF
   loop

loop

''—The next loop now fills as many of unfilled operational slots as possible
''---without regards to trying to limit COTS.  First pilot goes to first assignment.
For Each ASSIGNMENT in UNFILLED with NAME = "F15OPS"
  DO ''—Assigns F15 pilots to F15 slots
   FOR each PILOT in QOPS with WEAPON = "F15"
    Do
        IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
```

```
            COT = COT + 1
        ENDIF

        ASSGN = NAME
        DATE.ARRIVED = DATE
        IF LOC = "OVERSEAS"
            MOVE.DATE = DATE.ARRIVED + OS.Rule
          ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
        ENDIF

        LOCATION = LOC
        FLYING.NOW = FLY
            OPS = OPS + 1

        OFFICER = SSN

        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QOPS

''—File pilot in correct set Conus or Overseas
    IF LOCATION = "CONUS"
        FILE PILOT IN CONUS
        ELSE IF LOCATION = "OVERSEAS"
        FILE PILOT in OVERSEAS
        ALWAYS
        ALWAYS
      LEAVE

    Loop

  LOOP

For Each ASSIGNMENT in UNFILLED with NAME = "F16OPS"
 DO ''—Assigns F16 pilots to f16 assignments
   FOR each PILOT in QOPS with WEAPON = "F16"
    Do
        IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
            COT = COT + 1
        ENDIF

        ASSGN = NAME
        DATE.ARRIVED = DATE

        IF LOC = "OVERSEAS"
            MOVE.DATE = DATE.ARRIVED + Os.Rule
          ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
        ENDIF

        LOCATION = LOC
        FLYING.NOW = FLY
        OPS = OPS + 1
        OFFICER = SSN
         Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
```

```
            REMOVE PILOT from QOPS

''—File pilot in correct set Conus or Overseas
        IF LOCATION = "CONUS"
          FILE PILOT IN CONUS
          ELSE IF LOCATION = "OVERSEAS"
          FILE PILOT in OVERSEAS
        ALWAYS
        ALWAYS
      LEAVE
      Loop
    LOOP

for each PILOT in QOPS
  DO ''—Loop that clears out queue for Ops assignments for next quarter
    File PILOT in UNASSIGNED
    REMOVE PILOT from QOPS
  LOOP

Call ExpCal

end
```

Routine FTAsgn


```
for each PILOT in UNASSIGNED
  DO ''—Sorts pilots based on QFTIP rules in preamble
    File PILOT in QFTIP
    REMOVE PILOT from UNASSIGNED
  LOOP



For Each ASSIGNMENT in UNFILLED with NAME = "FT-IP"
  DO
    FOR each PILOT in QFTIP with GRADE > 2  ''—Ensures all pilots at least a Capt
    Do
      IF ((F.TYPE=WEAPON) and (F.HOURS>500)) or   ''—Ensures all IPS have at least 500 hours
            ((F.TYPE = "Fighter") and (F.HOURS>=500))

        ASSGN = NAME
        DATE.ARRIVED = DATE
        LOCATION = LOC
        FLYING.NOW = FLY
        IF Location = "CONUS"
          MOVE.Date = Date + TOS.RULE
        Endif

        IF location = "OVERSEAS"
          MOVE.Date = Date + OS.RULE
        Endif

            AETC = AETC + 1

        OFFICER = SSN

        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QFTIP

        FILE PILOT IN CONUS

      LEAVE

      ENDIF
    Loop

  LOOP

for each PILOT in QFTIP
  DO ''—Loop that clears out queue for Formal Training IPs for next quarter
    File PILOT in UNASSIGNED
    REMOVE PILOT from QFTIP
  LOOP

end
Routine SCHAsgn
```

```
for each PILOT in UNASSIGNED
  DO  ''—Sorts pilots based on QAFIT rules in preamble
    File PILOT in QAFIT
    REMOVE PILOT from UNASSIGNED
  LOOP

For Each ASSIGNMENT in UNFILLED with NAME = "ISS-STU"
  DO
    FOR each PILOT in QAFIT with GRADE = 4  ''—Ensures ISS students are majors
      Do
        IF (F.TYPE=WEAPON) and (ISS = 0)

          IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
            COT = COT + 1
          ENDIF

          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + 1.0
          LOCATION = LOC
          FLYING.NOW = FLY
          ISS = 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QAFIT

''—File pilot in correct set Conus or Overseas
          IF LOCATION = "CONUS"
            FILE PILOT IN CONUS
          ELSE IF LOCATION = "OVERSEAS"
            FILE PILOT in OVERSEAS
          ALWAYS
          ALWAYS
        LEAVE

        ENDIF
      Loop

  LOOP

For Each ASSIGNMENT in UNFILLED with NAME = "SSS-STU"
  DO
    FOR each PILOT in QAFIT with GRADE = 5  ''—Ensures SSS students are all Lt Col
      Do
        IF (F.TYPE=WEAPON) and (SSS = 0)

          IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
            COT = COT + 1
          ENDIF

          ASSGN = NAME
```

```
            DATE.ARRIVED = DATE
            MOVE.DATE = DATE.ARRIVED + 1.0
            LOCATION = LOC
            FLYING.NOW = FLY
            SSS = 1

            OFFICER = SSN

            Remove ASSIGNMENT from UNFILLED
            FILE ASSIGNMENT in FILLED
            REMOVE PILOT from QAFIT


    ''—File pilot in correct set Conus or Overseas
        IF LOCATION = "CONUS"
            FILE PILOT IN CONUS
            ELSE IF LOCATION = "OVERSEAS"
            FILE PILOT in OVERSEAS
        ALWAYS
        ALWAYS
      LEAVE

    ENDIF
    Loop

  LOOP


For Each ASSIGNMENT in UNFILLED with NAME = "AFIT-STU"
  DO
    FOR each PILOT in QAFIT
      Do
        IF (F.TYPE=WEAPON) and (GATE.TIME >= 10.0) and
          ((GRADE=3) or (GRADE = 4)) and (AFIT = 0)  ''—Ensures Pilots has over 10 years gate time and
                                        ''—is only a Capt or Maj, and hasn't attended AFIT before
              IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
            COT = COT + 1
          ENDIF

          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + 1.5
          LOCATION = LOC
          FLYING.NOW = FLY
          AFIT = 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QAFIT


    ''—File pilot in correct set Conus or Overseas
          IF LOCATION = "CONUS"
```

```
            FILE PILOT IN CONUS
            ELSE IF LOCATION = "OVERSEAS"
            FILE PILOT in OVERSEAS
          ALWAYS
        ALWAYS
      LEAVE

    ENDIF
    Loop

  LOOP


for each PILOT in QAFIT
  DO ''—Loop that clears out queue for School slots for next quarter
    File PILOT in UNASSIGNED
    REMOVE PILOT from QAFIT
  LOOP

end
```

Routine ALOAsgn

For each PILOT in UNASSIGNED
  DO ''—Sorts pilots based on QALO rules in preamble
    File PILOT in QALO
    REMOVE PILOT from UNASSIGNED
  LOOP

For Each PILOT in QALO with LOCATION = "OVERSEAS"
    DO ''—Assign overseas pilots to Conus ALO slots first to reduce COTs
    For Each ASSIGNMENT in UNFILLED with NAME = "ALO"
      Do
        IF ((ASSGN = "F15OPS") or (ASSGN = "F16OPS"))
            and ((GATE.TIME>=8.0) and (GATE.TIME<=12.0))
            and (Loc = "CONUS")

          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + TOS.RULE
          LOCATION = LOC
          FLYING.NOW = FLY
             ALO = ALO + 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QALO
          FILE PILOT in CONUS
        ENDIF
      leave
     loop
  LOOP

For Each ASSIGNMENT in UNFILLED with NAME = "ALO"
  DO
    For Each PILOT in QALO
      Do
        IF ((ASSGN = "F15OPS") or (ASSGN = "F16OPS"))
          and ((GATE.TIME>=8.0) and (GATE.TIME<=12.0))

        IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
          COT = COT + 1
        ENDIF

        ASSGN = NAME
        DATE.ARRIVED = DATE
        IF LOC = "OVERSEAS"
           MOVE.DATE = DATE.ARRIVED + OS.Rule
         ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
        ENDIF

        LOCATION = LOC

```
        FLYING.NOW = FLY
            ALO = ALO + 1

        OFFICER = SSN

        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QALO

"—File pilot in correct set Conus or Overseas
        IF LOCATION = "CONUS"
          FILE PILOT IN CONUS
          ELSE IF LOCATION = "OVERSEAS"
           FILE PILOT in OVERSEAS
          ALWAYS
          ALWAYS

        LEAVE

        ENDIF

   Loop

 LOOP

"--If unable to fill ALO requirements with pilots who have 8 to 12 years of gate time
"—use pilots with only 7 years of gate time
For Each ASSIGNMENT in UNFILLED with NAME = "ALO"
   DO
     For Each PILOT in QALO
       Do
        IF ((ASSGN = "F15OPS") or (ASSGN = "F16OPS"))
            and ((GATE.TIME>=7.0) and (GATE.TIME<=12.0))
         IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
           COT = COT + 1
         ENDIF

        ASSGN = NAME
        DATE.ARRIVED = DATE
        IF LOC = "OVERSEAS"
            MOVE.DATE = DATE.ARRIVED + OS.Rule
          ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
        ENDIF

        LOCATION = LOC
        FLYING.NOW = FLY
            ALo = ALO + 1

        OFFICER = SSN

        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QALO
```

```
''—File pilot in correct set Conus or Overseas
        IF LOCATION = "CONUS"
          FILE PILOT IN CONUS
          ELSE IF LOCATION = "OVERSEAS"
            FILE PILOT in OVERSEAS
          ALWAYS
        ALWAYS

        LEAVE

        ENDIF

    Loop

  LOOP

for each PILOT in QALO
    DO ''—Loop that clears out queue for ALO slots for next quarter
      File PILOT in UNASSIGNED
      REMOVE PILOT from QALO
    LOOP

  end
```

Routine STFAsgn

for each PILOT in UNASSIGNED
    DO ''—Sorts pilots based on QSTAFF rules in preamble
     File PILOT in QSTAFF
     REMOVE PILOT from UNASSIGNED
    LOOP

For Each Pilot in QSTAFF with LOCATION = "OVERSEAS"
 do ''—Try to limit COTs by doing Overseas pilots first
   For Each ASSIGNMENT in UNFILLED with NAME = "STAFF_F15"
    do ''F15 pilots into F15 staff slots
      IF (WEAPON = "F15") and (LOC = "CONUS")
          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + TOS.RULE
          LOCATION = LOC
          FLYING.NOW = FLY
              STAFF = Staff + 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QSTAFF
          FILE PILOT in CONUS
        leave
       ENDIF
     loop
 Loop

For Each Pilot in QSTAFF with LOCATION = "OVERSEAS"
 do ''—Try to limit COTs by doing Overseas pilots first
   For Each ASSIGNMENT in UNFILLED with NAME = "STAFF_F16"
    do ''—F16 pilots in to F16 slots
      IF (WEAPON = "F16") and (LOC = "CONUS")
          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + TOS.RULE
          LOCATION = LOC
          FLYING.NOW = FLY
              STAFF = Staff + 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QSTAFF
          FILE PILOT in CONUS
        leave
       ENDIF
     loop

Loop

For Each ASSIGNMENT in UNFILLED with NAME = "STAFF_F15"
DO ''—Fill F15 Staff Slots with first available F15 pilot
  FOR each PILOT in QSTAFF with WEAPON = "F15"
    Do
        IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
          COT = COT + 1
        ENDIF

        ASSGN = NAME
        DATE.ARRIVED = DATE
        IF LOC = "OVERSEAS"
            MOVE.DATE = DATE.ARRIVED + OS.Rule
         ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
        ENDIF

        LOCATION = LOC
        FLYING.NOW = FLY
            STAFF = Staff + 1

        OFFICER = SSN

        Remove ASSIGNMENT from UNFILLED
        FILE ASSIGNMENT in FILLED
        REMOVE PILOT from QSTAFF

''—File pilot in correct set Conus or Overseas
        IF LOCATION = "CONUS"
          FILE PILOT IN CONUS
          ELSE IF LOCATION = "OVERSEAS"
           FILE PILOT in OVERSEAS
          ALWAYS
         ALWAYS
       LEAVE

    Loop

  LOOP

For Each ASSIGNMENT in UNFILLED with NAME = "STAFF_F16"
 DO ''—Fill F16 Staff slots with First Available F16 Pilots
  FOR each PILOT in QSTAFF with WEAPON = "F16"
    Do
        IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
          COT = COT + 1
        ENDIF

        ASSGN = NAME
        DATE.ARRIVED = DATE

        IF LOC = "OVERSEAS"
            MOVE.DATE = DATE.ARRIVED + OS.Rule

```
                    ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
                    ENDIF

                    LOCATION = LOC
                    FLYING.NOW = FLY
                        STAFF = Staff + 1

                    OFFICER = SSN

                    Remove ASSIGNMENT from UNFILLED
                    FILE ASSIGNMENT in FILLED
                    REMOVE PILOT from QSTAFF

        ''—File pilot in correct set Conus or Overseas
                IF LOCATION = "CONUS"
                  FILE PILOT IN CONUS
                  ELSE IF LOCATION = "OVERSEAS"
                    FILE PILOT in OVERSEAS
                  ALWAYS
                  ALWAYS
                LEAVE

            Loop

        LOOP

For Each Pilot in QSTAFF with LOCATION = "OVERSEAS"
 do ''—Attempt to reduce COT going to General Staff Slot by putting Overseas
        ''--- Pilots in a Conus position
    For Each ASSIGNMENT in UNFILLED with NAME = "STAFF-FTR"
    do
      IF (LOC = "CONUS")
          ASSGN = NAME
          DATE.ARRIVED = DATE
          MOVE.DATE = DATE.ARRIVED + TOS.RULE
          LOCATION = LOC
          FLYING.NOW = FLY
              STAFF = Staff + 1

          OFFICER = SSN

          Remove ASSIGNMENT from UNFILLED
          FILE ASSIGNMENT in FILLED
          REMOVE PILOT from QSTAFF
          FILE PILOT in CONUS
        leave
      ENDIF
    loop

loop


For Each ASSIGNMENT in UNFILLED with NAME = "STAFF-FTR"
  DO ''—Fill remaining general fighter staff with pilots that are available
    FOR each PILOT in QSTAFF
```

```
Do
      IF (LOC = "OVERSEAS") and (LOCATION = "OVERSEAS")
          COT = COT + 1
      ENDIF

      ASSGN = NAME
      DATE.ARRIVED = DATE

      IF LOC = "OVERSEAS"
          MOVE.DATE = DATE.ARRIVED + OS.Rule
         ELSE MOVE.DATE = DATE.ARRIVED + TOS.RULE
      ENDIF

      LOCATION = LOC
      FLYING.NOW = FLY
          STAFF = Staff + 1

      OFFICER = SSN

      Remove ASSIGNMENT from UNFILLED
      FILE ASSIGNMENT in FILLED
      REMOVE PILOT from QSTAFF

"—File pilot in correct set Conus or Overseas
      IF LOCATION = "CONUS"
        FILE PILOT IN CONUS
        ELSE IF LOCATION = "OVERSEAS"
         FILE PILOT in OVERSEAS
        ALWAYS
        ALWAYS
      LEAVE.

   Loop


LOOP


for each PILOT in QSTAFF
   DO  "—Loop that clears out queue for Staff slots for next quarter
    File PILOT in UNASSIGNED
    REMOVE PILOT from QSTAFF
   LOOP


end
```

Routine ExpCal

"******* Calculate Experience Level *********"
F15con = 0
ExpF15Con = 0

F16con = 0
ExpF16Con = 0

F15ovr = 0
ExpF15ovr = 0

F16ovr = 0
ExpF16ovr = 0

FOR each PILOT in CONUS
  DO
    IF ASSGN = "F15OPS" ''—Loop to count number of F15 pilots in CONUS and Number who are
                        ''-- Experienced
    F15con = F15con + 1
    IF (F15.HOURS >=500) or
        ((F15.HOURS >=300) and (TOTAL.HOURS >=1000)) or
        ((F15.HOURS >=200) and (F.HOURS >= 600))
      ExpF15Con = ExpF15Con + 1
    ENDIF
  ENDIF

    IF ASSGN = "F16OPS" ''—Loop to count number of F16 pilots in CONUS and Number who are
                        ''-- Experienced
    F16con = F16con + 1
    IF (F16.HOURS >=500) or
        ((F16.HOURS >=300) and (TOTAL.HOURS >=1000)) or
        ((F16.HOURS >=200) and (F.HOURS >= 600))
      ExpF16Con = ExpF16Con + 1
    ENDIF
  ENDIF

  LOOP

FOR each PILOT in OVERSEAS
  DO
    IF ASSGN = "F15OPS" ''—Loop to count number of F15 pilots in OVERSEAS and Number who are
                        ''-- Experienced
    F15ovr = F15ovr + 1
    IF (F15.HOURS >=500) or
        ((F15.HOURS >=300) and (TOTAL.HOURS >=1000)) or
        ((F15.HOURS >=200) and (F.HOURS >= 600))
      ExpF15Ovr = ExpF15OVr + 1
    ENDIF
  ENDIF

    IF ASSGN = "F16OPS" ''—Loop to count number of F16 pilots in CONUS and Number who are

114

```
                              ''-- Experienced
    F16ovr = F16ovr + 1
    IF (F16.HOURS >=500) or
        ((F16.HOURS >=300) and (TOTAL.HOURS >=1000)) or
        ((F16.HOURS >=200) and (F.HOURS >= 600))
     ExpF16ovr = ExpF16ovr + 1
    ENDIF
   ENDIF

   LOOP


end
```

Bibliography

1. Banks, Jerry and John S. Carson II, Barry L. Nelson. <u>Discrete-Event System Simulation.</u> Upper Saddle River, New Jersey: Prentice Hall Inc, 1996.

2. Charpie, Capt Kenneth E. Jr. <u>An Analysis of Chronic Personnel Shortages in the B-52 Radar Navigator Career Field.</u> MS thesis, AFIT/GST/ENS/87M-4. School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB OH, March 1987.

3. Durso, Anthony and Scott F. Donahue. "An Analytical Approach to Reshaping the United States Army," <u>Interfaces,</u> 25: 109-133 (January-February 1995).

4. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, Telephone Interview, 22 August 96.

5. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, E-mail Correspondence, 17 October 96.

6. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, E-mail Correspondence, 31 October 96.

7. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, E-mail Correspondence, 5 November 96.

8. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, Telephone Interview, 3 December 96.

9. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, E-mail Correspondence, 6 December 96.

10. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, Telephone Interview, 16 December 96.

11. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, E-mail Correspondence, 16 December 96.

12. Garton, Tony, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, Telephone Interview, 7 January 97.

13. Gass, Saul I. "Military Manpower Planning Models," <u>Computers and Operations Research,</u> 18: 65-73 1991.

14. Grinold, Richard C. And Kneale T. Marshall. <u>Manpower Planning Models</u>. Amsterdam: North-Holland Publishing Company, 1977.

15. Headquarters Air Force Personnel Center, "Officer Promotions", World Wide Web Site, http://www.afpc.af.mil/analysis/promote/offprom.htm, September 1996.

16. Hegedusich, Bill, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, Telephone Interview, 13 January 97.

17. Jameson, Capt Roberta A. <u>Modeling the Rated Force Using Network Flow and Goal Programming Techniques.</u> MS thesis, AFIT/GOR/ENS/88D-16. School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB OH, December 1988.

18. Knight, Jon M. <u>The Aggregate Pilot Pipeline Model</u>. Technical report, AFIT TR 78-6. School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, OH, November 1978.

19. Law, Averill M. And W. David Kelton. <u>Simulation Modeling and Analysis.</u> New York, New York: McGraw-Hill, Inc, 1982.

20. Olson, Maj Mark S. <u>A Network Approach to Rated Officer Gate Management.</u> MS thesis, AFIT/GOR/ENS/78D-13. School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB OH, December 1987.

21. Wiseman, Jeff, Maj, USAF. Headquarters Air Force Personnel Center/Analysis Division, Randolph AFB, TX, E-mail Correspondence, 31 January 97.

Vita

Anthony J. Hutfles ███████████████████████████, the son of John and Theresa Hutfles. In the summer of 1980, he graduated from Seneca Township High School and enter the U.S. Air Force Academy. In May 1984 he graduated from U.S. Air Force Academy. After completion of Undergraduate Navigation Training and Electronic Warfare Officer Training, he was assigned to the 24 SRS, Eielson AFB, AK. In October 1988 he PCSed to 343 SRS, Offutt AFB, NE. He has been qualified as an instructor/evaluator electronic warfare officer in both the RC-135S and RC-135V/W. He entered the School of Engineering, Air Force Institute of Technology in August 1995.

Permanent Address: ██████████

REPORT DOCUMENTATION PAGE

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE February 1997	3. REPORT TYPE AND DATES COVERED Master's Thesis

4. TITLE AND SUBTITLE
Simulation Model of Fighter Pilot Assignment Process

5. FUNDING NUMBERS

6. AUTHOR(S)
Anthony J. Hutfles, Major, USAF

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Air Force Institute of Technology/ENS
2750 P Street
Wright-Patterson AFB, Ohio 45433-7765

8. PERFORMING ORGANIZATION REPORT NUMBER
AFIT/GOA/ENS/97-10

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
HQ AFPC/DPAOY1
550 C Street West Suite 36
Randolph AFB, TX 78150-4738

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for Public Release; Distribution is Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This thesis analyzes the effect Continental United States (CONUS) Time on Station (TOS) has on filling critical rated assignments. A SIMSCRIPT II.5 simulation model of the F15 and F16 pilots assignment process was developed. The simulation tested the effect of changing CONUS TOS from 3 years to 6 years in half year increments. Analysis of the number of unfilled rated assignments from simulation runs of 10 years in length indicated that changing CONUS TOS by itself has no statistically significant effect on model's output. The analysis was expanded to a 2^2 factorial experimental design using CONUS TOS and Total Active Rated Service (TARS) as independent variables, and unfilled assignments and pilots unassigned as the responses. Second-order effects present in the response surfaces then necessitated expanding the original design to fully determine the effect of CONUS TOS and TARS on the Air Force's ability to minimize the number of unfilled assignments and number of pilots without assignments.

14. SUBJECT TERMS
Simulation, Factorial Design, Central Composite Design, Assignment Process, Response Surface Methodology

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102