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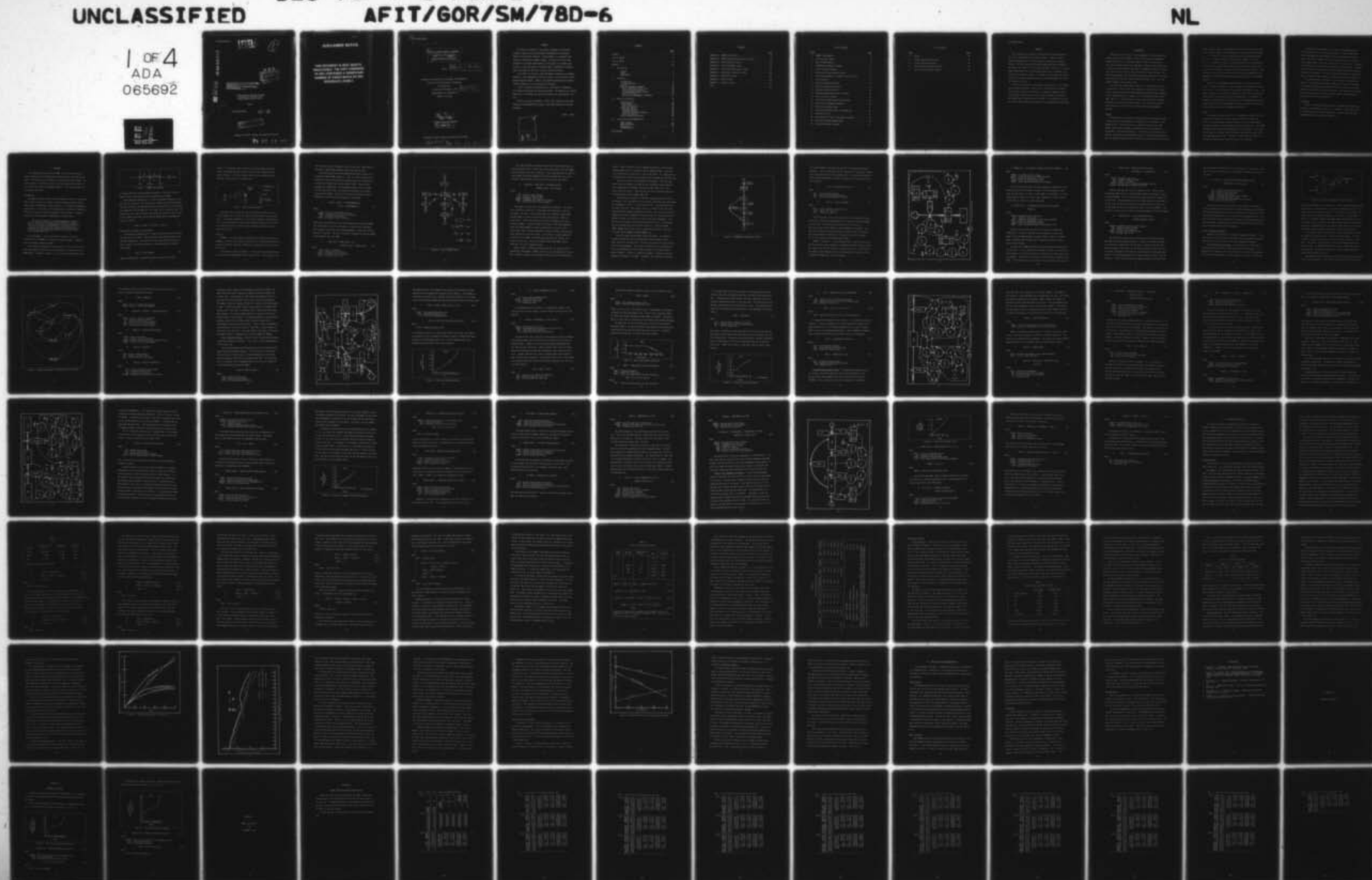

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SYSTEMS DYNAMICS MODELING APPROACH TO ANALYSIS OF THE USAF PILOT PRODUCTION/ALLOCATION SYSTEM

THESIS

AFIT/GOR/SM/78D-6

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Preface

The analysis presented in this report represents a preliminary attempt in applying the system dynamics methodology to the United States Air Force pilot resource. System dynamics is a powerful technique for investigating complex systems. My efforts will have been worthwhile if a better understanding of the system is provided; additionally, I hope the model will provide useful information to managers about the impacts of decisions on policy within the system.

In an effort to provide a useful document as opposed to an academic exercise, I have attempted to write this report in plain English to the maximum possible extent. However, the modeling techniques and computer software essential to the discussion are included.

I wish to express my gratitude to Dr. Jon Knight for suggesting this study and providing his aid and assistance. My thanks to Dr. Charles McNichols for reviewing this report and offering his constructive criticism.

Finally, and most importantly, I would like to thank my wife, Neva. Without her encouragement and support, this thesis would not have been completed.

Peter L. Fekke

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Abstract

This research was conducted to investigate the United States Air Force pilot production and allocation system. It applies system dynamics methodology as an effective means to analyze this complex system. The Pilot Production/Allocation Management Model (PP/AMM) is developed using DYNAMICS III simulation language. The model is an aggregated representation of the system which deals with recruitment, allocation, and training of pilots. It divides pilot resources into three core forces, rated supplement resources, and Undergraduate Pilot Training instructor pilots.

Initially, the system is analyzed by a discussion of a cost module and of system equilibrium. Next, various force build-up, draw-down, and attrition scenarios are analyzed. A change of management policy involving the forecasting of attrition rates concludes the analysis and demonstrates an application of the model. This example also shows how rapidly and economically information can be obtained from the model.

I. Introduction

The subject of this thesis is the management of pilots within the United States Air Force (USAF). The pilot force attracts management interest because it is a relatively small portion of the entire Air Force (AF) personnel system that generates a relatively high proportion of the costs associated with that system. Management interest in controlling costs and force quality comes from Pareto's law which states "The significant elements in a specified group usually constitute a relatively small portion of the total items in the group" (Ref 1:132). The rule suggests emphasis on the pilot force.

In his Air War College paper, Colonel J. B. Davis states "The distribution and training of the rated resource has often times followed loosely described and imprecise methodologies, especially when subjected to the intense pressures of change, i.e., the Vietnam buildup and draw down" (Ref 2:1). Pilot training is costly, and the need for training increases as force attrition accelerates. Thus, the current significant increase in pilot attrition is drawing high-level management interest.

Purpose

The purpose of this research is to develop a systems dynamics model of the pilot force and evaluate its usefulness in the formation of management policy. The pilot force is a complex system that must cope within a wide range of dynamic variables which are not particularly susceptible to accurate forecasting. Its complexity and internal interactions, along with the unpredictable nature of its background conditions, make it important that policies are consistently formulated to be resilient against varying inputs. One approach to policy design that lends itself to this type of problem is the methodology of systems dynamics developed by J. W. Forrester. The Pilot Production/Allocation Management Model (PP/AMM) is a systems dynamics model written in DYNAMO III; it was developed and applied in order to provide information about the behavior of pilot force structure when stressed by such things as variable attrition, force draw-downs or build-ups, and various training policies. The information can aid in the evaluation of current and contemplated force management policies and suggest the most productive areas for management attention.

The model is an aggregated representation of the Air Force pilot force. It does not attempt to track or forecast the movement of individual pilots. It is not intended to provide exact estimates of costs. The model's purpose is to simulate the behavior of the pilot force structure under specific environmental and policy assumptions. In addition, its purpose is to analyze the cost implications of this behavior and discriminate between different environmental and policy factors on the basis of relative costs and critical management indicators.

Scope

In any thesis research effort, it is necessary to identify the limitations of the project in order to keep the results in perspective. First, this research uses a computer model as an aid to understanding real world systems, and such models have obvious limitations. The PP/AMM presented in this paper is an abstraction of the real world. The author has included in this model what his research and experience seem to him to be the important factors. The model is useful only as long as it is used within the analytical scope for which it was designed.

would be replaced from the pilots in the job level, in most cases. Very

In the analysis presented in this thesis, the PP/AMM configures the pilot force into only five pilot job areas. They represent the rated supplement, the Undergraduate Pilot Training (UPT) instructor force, the tactical fighter (and miscellaneous) pilot force, the strategic bomber/tanker pilot force, and the airlift pilot force. The system training delays and flying time requirements are all averages. In order to avoid security classification, the crew manning factors are realistic estimates of the author. The size of the aircraft and pilot forces simulated in the model are arbitrary, but they are of realistic dimensions.

The second necessary limitation is on the range of analyses performed. In this study, three basic changes in the force are examined. The situations simulated and analyzed are force build-ups, force drawdowns, and accelerated force attrition rates. The research also includes a sensitivity analysis of certain relevent factors and an example of a policy change involving forecasting.

Development

Chapter II explains the approach used in developing the model and then gives a detailed description of it. Chapter III gives the results of simulations used to analyze the system. Finally, conclusions and recommendations are presented in Chapter IV.

II. The Model

This chapter describes the AF PP/AMM. The first section gives a brief explanation of the methodological approach used in developing the model. The second section presents an overview of the model design. The third section is a detailed description of the model structure which is set forth in the areas of management emphasis. This forms the basis for the analyses performed.

The Approach

Management systems, such as the pilot pipeline system, are so complex that a formal structure is needed to clarify ambiguities and to enable total system understanding. Systems Dynamics is the modeling methodology developed by J. W. Forrester of the Massachusetts Institute of Technology (MIT) and is based on information-feedback control theory. To support the need for systems dynamics methodology, Forrester states,

> The general concepts of information-feedback systems are essential because such systems exhibit behavior as a whole which is not evident from examination of the parts separately. The pattern of system interconnection, the amplification caused by decisions and policy, the delays in actions and the distortion in information flows combine to determine stability and growth [Ref 3:16].

Systems Dynamics. The systems dynamics approach is applied through the use of DYNAMO III computer programming language. DYNAMO is used in continuous simulation models.

Each computation sequence occurs across time. Time is divided into equal time segments referred to as DT and defined as a constant in the DYNAMO model. As shown in Figure 1, "K" is used to designate the points

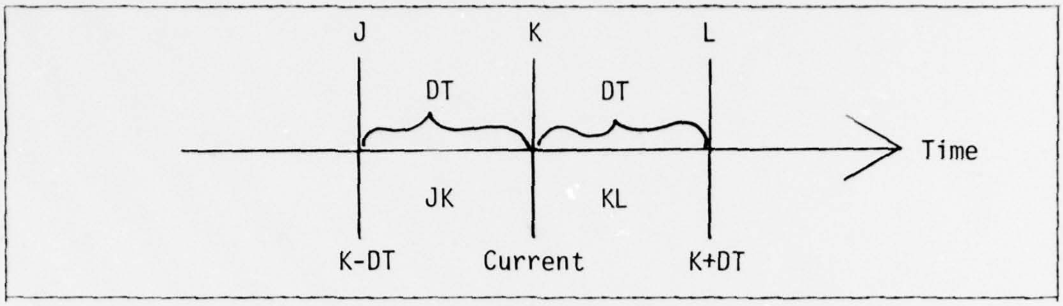

Figure 1. DYNAMO Time Sequence

in time to which the current computation applies. The use of time will become clearer as the level and rate equations are discussed.

Level equations (denoted by "L" on the left margin) represent a storage area for a resource. The current level stands for the previous quantity plus the flow in (IN.JK) and minus the flow out (OUT.JK) of it during the computation time increment DT. The level, Eq (1), would be read: the present level (at time K) is equal to the previous level (at time J) plus the net change due to the flows in and out during the time increment DT (time J to time K).

```
L       LEVEL.K = LEVEL.J + DT*(IN.JK - OUT.JK)              (1)
```

Note how this represents an integration.

Rate equations (denoted by "R" on the left margin) control the flows into and out of the levels. They are policies that remain constant over the time increment DT. The rate OUT, Eq (2), over the next time increment is equal to the current quantity in LEVEL divided by a constant called DELAY.

```
R       OUT.KL = LEVEL.K/DELAY                               (2)
```

Rates use information to control the flows into and out of levels.

Figure 2 is a diagram to help visualize the relationships discussed above. An example would be a water tank with water flowing out and water flowing in. The rate of water flowing out would depend on the quantity in the tank and a constant delay.

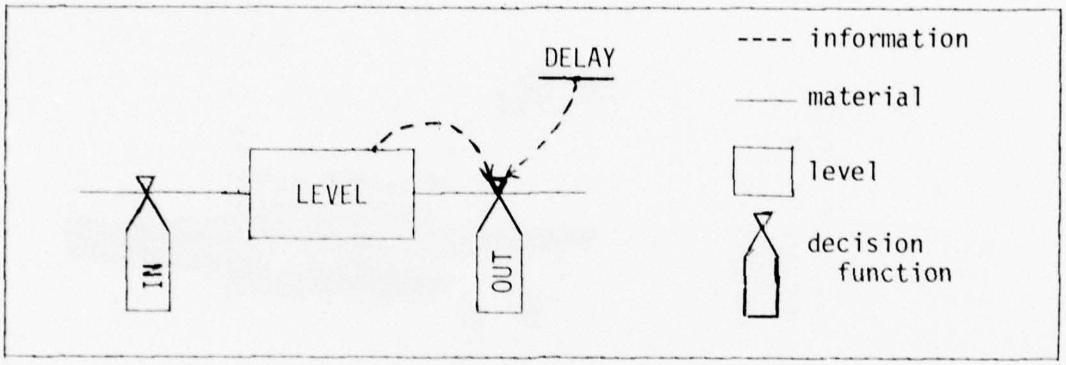

Figure 2. Level and Rate Diagram

The other types of equations used in building the model are auxiliaries (denoted by "A" on the left margin) which simplify the rate equations. The constant (denoted by "C" on the left margin), table (denoted by "T" on the left margin), and initial condition (denoted by "N" on the left margin) equations are used to input parameters and data into the model (Ref 4:21-22).

<u>Overview</u>

PP/AMM is a Systems Dynamics representation of the portion of the AF manpower, personnel, and training system relevant to planning and experiencing the recruitment, training, allocation, and attrition of pilots in the US Air Force.

First consider inputs and outputs. Pilots enter the system when they are recruited for undergraduate pilot training (UPT). The only way a pilot can leave the system is through attrition from a job. The essence of the model is what happens between acquisition and attrition.

Pilot acquisitions flow from undergraduate pilot training to an assignment window (WIND) (Figure 3). This is a level equation and is increased by those pilots who have graduated from pilot training but are not yet at Combat Crew Training School (CCTS). The new pilot graduates are labeled UPT. The assignment window is also increased by pilots who are en route to upgrade-training and cross-training into new jobs, TOWIND. The rate pilots leave the window is called TOTRNG and is subtracted from the number in the window.

```
L       WIND.K = WIND.J + DT*(SUM(TOWIND.JK)
                  + UPT.JK - SUM(TOTRNG.JK))              (3)
```

where

```
  WIND = pilots in reallocation process
TOWIND = assignment rate from pilot catetory
   UPT = mission pilot graduates
TOTRNG = assignment rate to training
```

Pilots move from WIND into a level containing those in training (TRNG). This level holds all pilots in training. It may be CCTS, instructor pilot upgrade, training for the rated supplement, or any other training that may be required. The level training is increased by the rate TOTRNG and decreased by the rate TOJOB.

```
L       TRNG.K(CAT) = TRNG.J(CAT) + DT*
                  (TOTRNG.JK(CAT) - TOJOB.JK(CAT)         (4)
```

where

```
  TRNG = pilots in training
   CAT = category iteration index
TOTRNG = assignment rate to training
 TOJOB = assignment rate to job
```

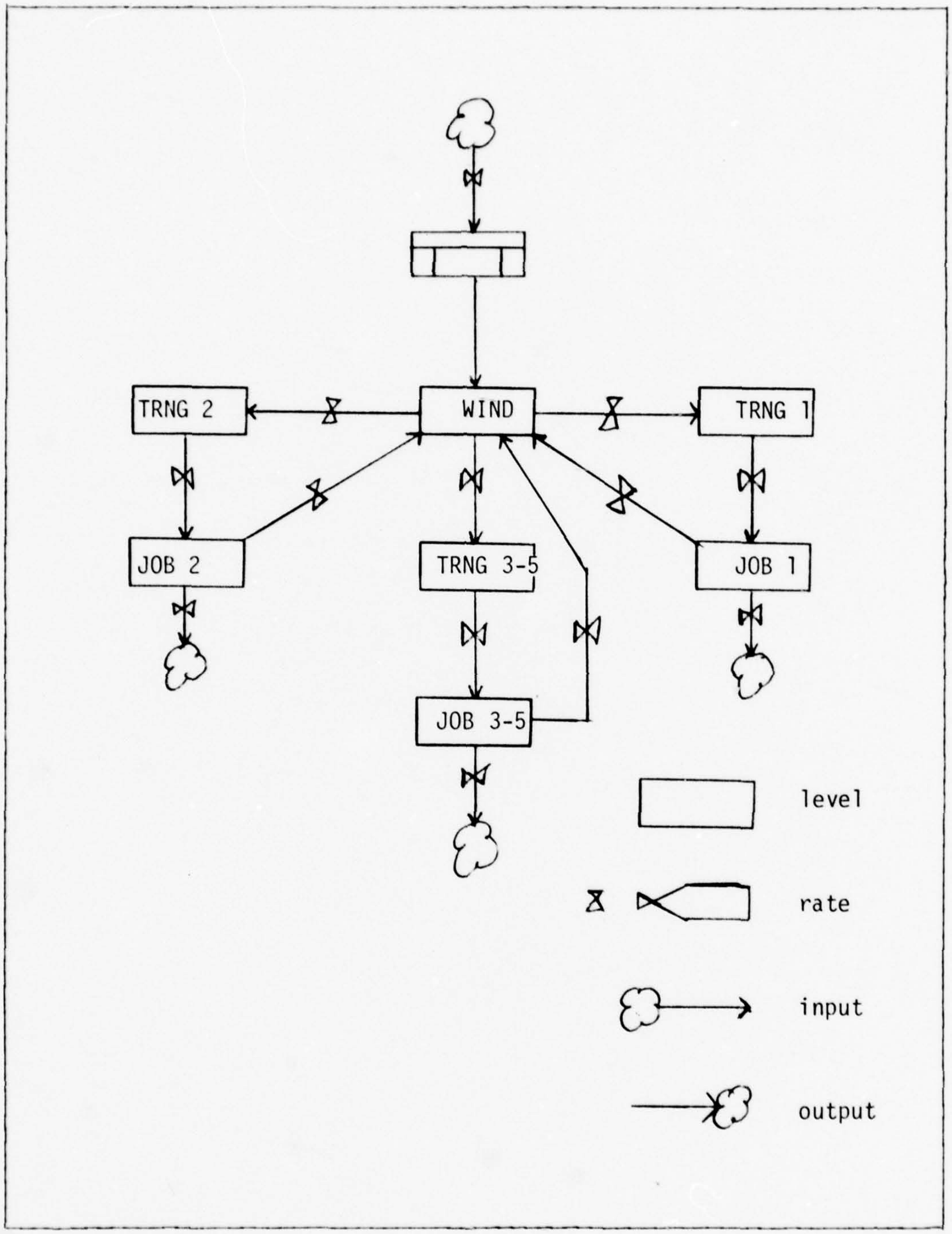

Figure 3. Basic PP/AMM Diagram

The level job (JOB) represents the part of the pilot force that is doing a particular job. Pilots flow from training into their job (TOJOB). Pilots may leave their job in two ways. First, they may leave in order to flow through the window (TOWIND) to training and then back into a job. The other flow from JOB is attrition out of the pilot force (ATT).

```
L    JOB.K(CAT) = JOB.J(CAT) + DT*(TOJOB.JK(CAT)
                  - TOWIND.JK(CAT) - ATT.JK(CAT))          (5)
```

where

JOB = pilots in each category
CAT = category iteration index
TOJOB = assignment rate to job
TOWIND = assignment rate from pilot category
ATT = pilot attrition rate by category

The model is divided into five separate job categories. It uses an array structure so that JOB 1 through JOB 5 each represent a level in the model. The same is true of the levels for training, so that TRNG 1 through TRNG 5 are the five training flows into each job. WIND is a single level. There are actually five tracks from WIND, one to each training category. Track one flows to all jobs in the rated supplement. Track two flows between all levels affecting UPT instructor pilots. Tracks three, four, and five represent all mission pilots; they are sometimes referred to as the core force. Track three is roughly equivalent to all pilots in fighter, reconnaissance, and those not fitting into tracks four and five. Track four contains tanker and bomber pilots. Track five is for all transport pilots.

After a pilot is initially trained and enters the system from UPT through CCTS (aggregated in TRNG), he will go to a designated job requirement. Normally, he will cycle through additional training throughout his career. Some training will be for upgrade and some for cross-training. Mixing between tracks is allowed in the assignment window. All pilots in the system are accounted for in one of the levels. As stated earlier, the only way for a pilot to leave the system is through an attrition flow.

There are six basic rate equations in the model. "The rate equations state our perception of how the real system decisions respond to the circumstances surrounding the decision point" (Ref 5:10). The rates contain no pilots. They describe the rate of flow into and out of the three types of level—WIND, TRNG, JOB.

The discussion of rates will follow an expected flow for a pilot in the system. He is procured for pilot training, then moves into the window for assignment to a CCTS. He next moves to CCTS. Upon completing CCTS, he flows to his job. After doing a job for a period of time, he cycles back through the window to additional training. This training may be for upgrade to aircraft commander or instructor pilot to cross-training into another aircraft, or to move into a job in the rated supplement. This type of cycle continues until he leaves the pilot force. In this model, he leaves through the attrition rate (Figure 4). The rates TOTRNG, TOJOB, TOWIND, and ATT are active in each track; therefore, there are five rates called TOTRNG1 through TOTRNG5, etc.

The pilot production pipeline contains two rates. The number of students procured for pilot training (PREC) and the number of graduates from pilot training (UPT). Currently, 95 percent of those entering pilot training graduate. This figure is constant and is controlled by Air Training Command (ATC) by varying the amount of training given to weaker students. In order to simplify the model, a constant 95 percent graduation percentage is assumed. Therefore, PREC represents 95 percent

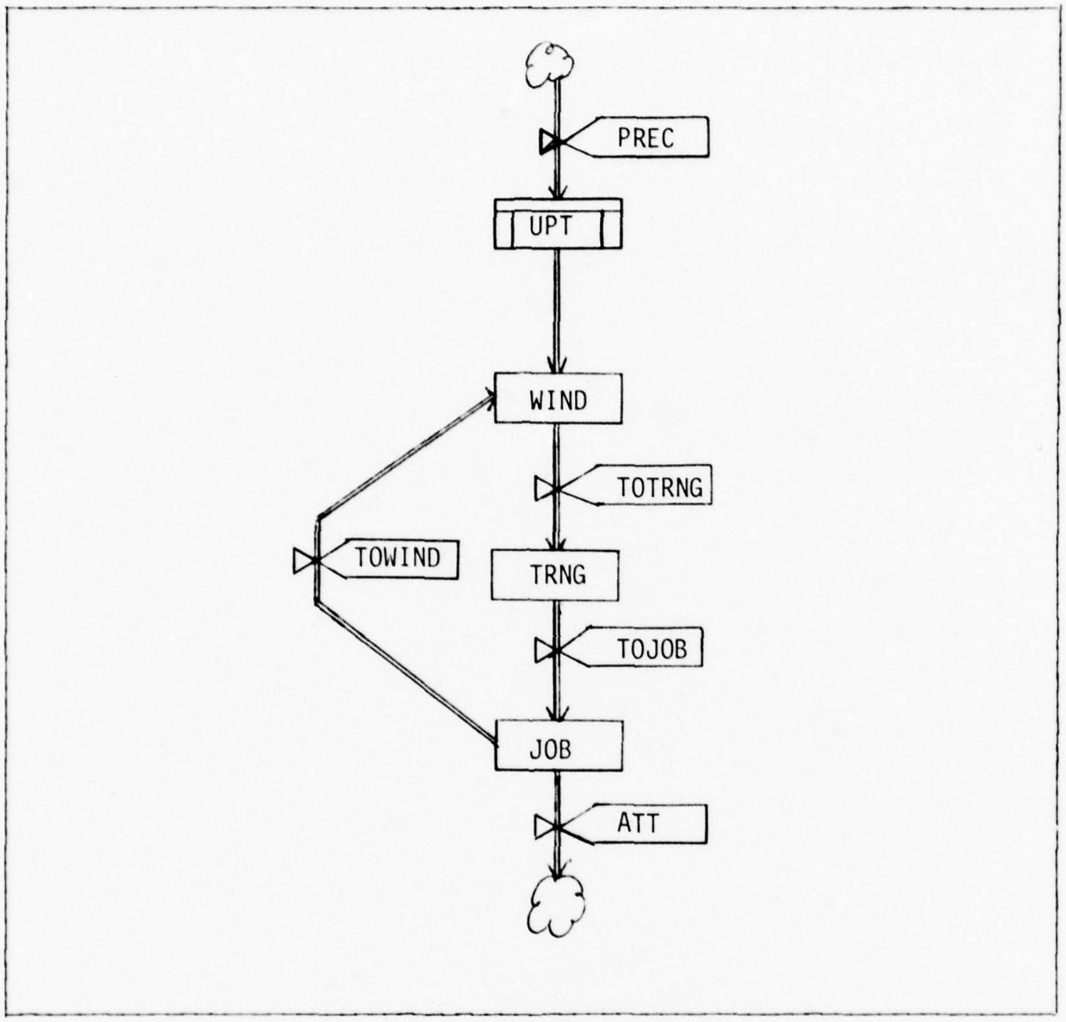

Figure 4. PP/AMM Rate Integration Diagram

of the total number recruited, and this will be the number eventually graduated. This is consistent with the computation of instructor/student ratios and amortization of procurement costs. The 5 percent washouts are merely deleted immediately, instead of spread out over the training period (Figure 5).

R UPT.KL = DELAY3(PREC.JK,TDEL.K) (6)

where

UPT = mission pilot graduates
PREC = pilot candidate recruiting rate
TDEL = average time through UPT pipeline

R PREC.KL = (CSIZE.K/4)*MREC.K (7)

where

PREC = pilot candidate recruiting rate
CSIZE = annual UPT class size
MREC = recruiting capacity

The UPT equation, Eq (6), represents the pilot candidate training process as a third-order exponential delay of the rate that the students are recruited. The resulting outflow represents the number of new pilots entering the window for job assignments each quarter. The UPT input reflects the two-year planning process for the UPT pipeline with some management flexibility as the need for new pilots changes. UPT is a rate into the assignment window (WIND).

TOTRNG is the rate from the assignment window to the training level. The rate into the rated supplement is computed differently than the other four tracks, but the CLIP function is used in each case. The CLIP function makes a choice between the first two arguments on the basis of the relationship between the last two arguments.

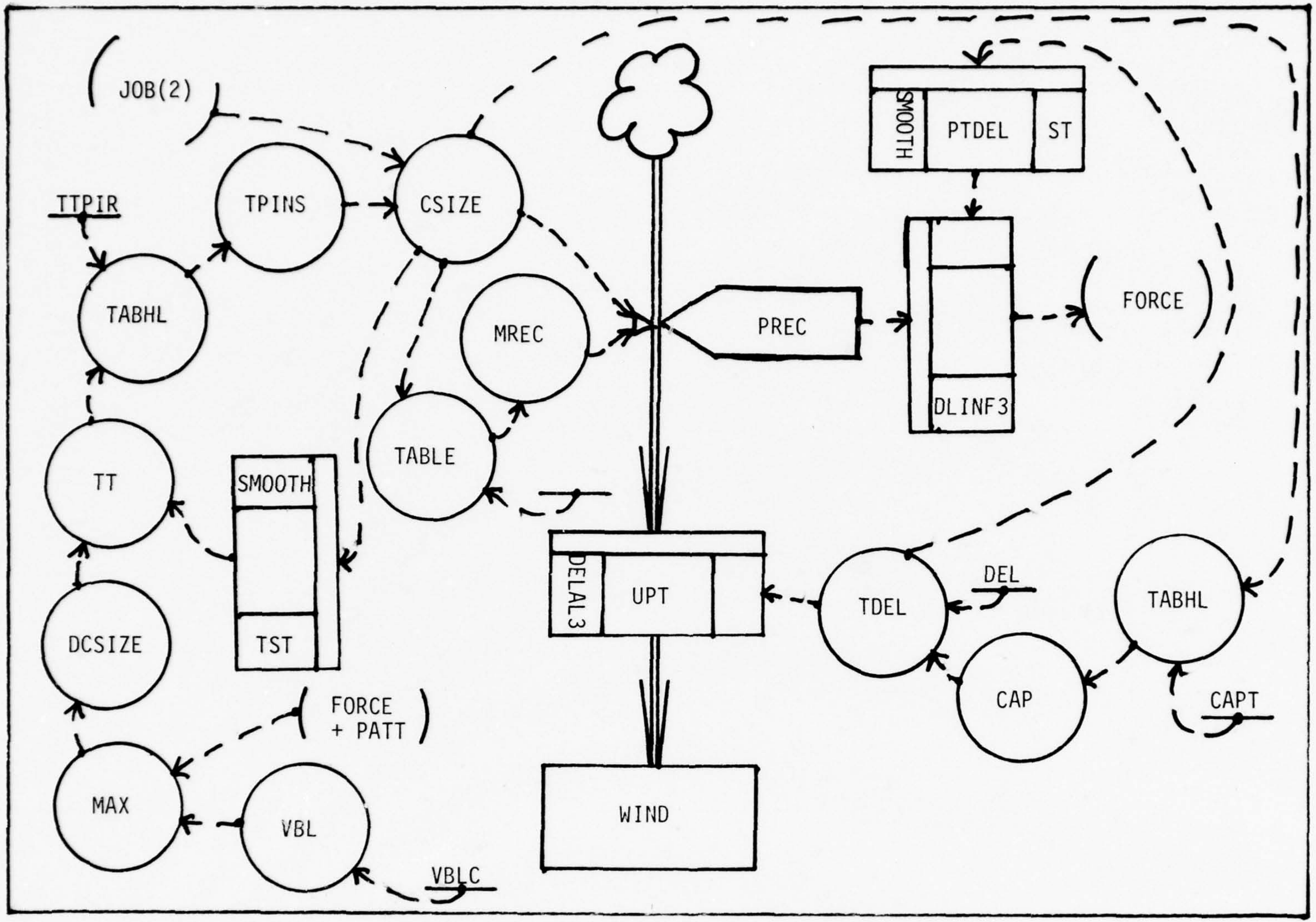

Figure 5. Pilot Production Pipeline

R TOTRNG.KL(1) = CLIP(INVSUP.K,INDISC.K(1),WIND.K,TONEED.K) (8)

where

TOTRNG = assignment rate to training
INVSUP = pilots available for rated supplement
INDISC = projected assignments to jobs
WIND = pilots in reallocation process
TONEED = total required personnel for assignment

The rate into training for the rated supplement (TOTRNG(1)) is the number of pilots in the window in excess of the requirements for the other four categories of pilots if the number in the window is, in fact, greater than or equal to the total need. Otherwise, it gets a proportional share to maintain a viable supplement.

R TOTRNG.KL(PIL) = CLIP(NEED.K(PIL),INDISC.K(PIL),WIND.K,
TONEED.K) (9)

where

TOTRNG = assignment rate to training
PIL = index for flying jobs
NEED = personnel requirement in the rated supplement
INDISC = projected assignments to jobs
WIND = pilots in reallocation process
TONEED = total required personnel for assignment fills

The rate into training for each of the other four categories, TOTRNG (PIL), is equal to the need in each category as long as the number in the assignment window is greater than or equal to the total need. Otherwise, each category gets a proportional share of those pilots in the windown.

The next rate, TOJOB, determines the flow from the training level to the job level. It is a function of the number of pilots in training for each category of job and the average time required to complete the training (ATUGPD). The TEST12 and ATJTIME are test and policy variables in the model. The training delays are assumed to be constant for each category.

R TOJOB.KL(CAT) = TRNG.K(CAT)*TEST12.K(CAT)/
(ATUPGD(CAT) + ATJTIME(CAT)) (10)

where

TOJOB = assignment rate to job
CAT = category interation index
TRNG = pilots in training
ATUPGD = average time in upgrade/reassignment pipeline
ADJTIME = average time to adjust pilot force

There are two ways for a pilot to depart his job. Normal career progression would put him in the assignment window for upgrade or cross-training (TOWIND). Also, a pilot may leave the pilot force by some form of attrition. The assignment rate to the window depends on the number of pilots in the job and the average time in the job modified by the ratio of the number in the job to the desired number in the job (DFORCE). The result is a larger time in a job as the desired number in the job increases.

R TOWIND.KL(CAT) = (JOB.K(CAT)*JOB.K(CAT))/
(DFORCE.K(CAT)*ATJ.K(CAT)) (11)

where

TOWIND = assignment rate from pilot category
CAT = category interation index
JOB = pilots in each category
DFORCE = desired force size by mission
ATJ = average time in job

The other way to leave a job is through an attrition which causes the pilot to leave the system entirely. In order to simplify the model, all attrition is removed from the job level. Attrition from the pilot pipeline system is the result of such things as death, removal from flying status, promotion to 06 (colonel), and voluntary or involuntary separations. The overwhelming majority of these losses would occur from the job level. The few losses from the assignment window or training levels would be replaced from the pilots in the job level, in most cases. Very little is lost by accounting for the remainder of these losses from the job level.

R ATT.KL(CAT) = JOB.K(CAT)*ATTRATE(CAT)*ATTADJ.K(CAT)/ATADJTM(CAT)) + TEST4.K(CAT) (12)

where

ATT = pilot attrition rate by category
CAT = category interation index
JOB = pilots in each category
ATTRATE = programmed attrition rate by category
ATTADJ = attrition adjustment factor
ATADJTM = attrition rate adjustment time by category
TEST4 = test on attrition rate

The attrition rate is calculated as a percentage of the number in each job category and modified by an attrition adjustment factor (ATTADJ). The attrition adjustment reflects a limited ability to adjust pilot attrition when the desired force is different from the projected force. Thus, when pilots are scarce, separations are reduced; and when there are extra pilots available, separations are increased through actions such as early out and reduction-in-force (RIF) programs.

Areas of Management Emphasis

The model is divided into five areas of management emphasis: force structure by pilot type, pilot production pipeline, assignment/reassignment control, force size policy, and force management parameters.

Force Structure by Pilot Type. Force structure by pilot type has been explained by discussing the levels and rates in the model. It is worthwhile to examine a casual-loop diagram (Figure 6) to further explain the structure of the model. Consider a specific job skill. Pilots are

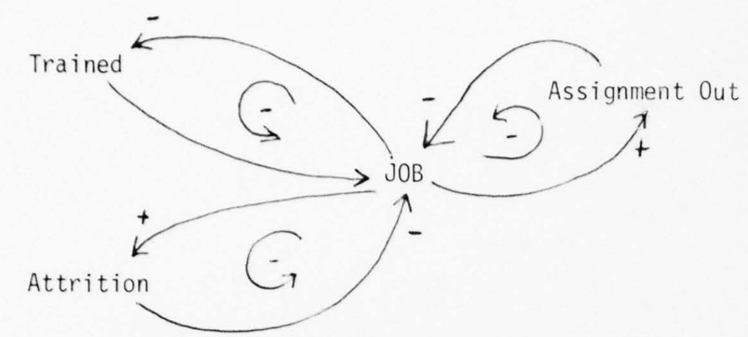

Figure 6. Casual-Loop Diagram for Model Structure

lost due to assignment out or attrition. They are gained by being trained to do the job. Notice each loop is a negative feedback loop, which indicates goal-seeking behavior (Ref 6:37). For example, an increase in the inflow rate will increase the number in a given job. As the number in the job is increased, however, the number leaving by attrition will tend to increase. But, as attrition is increased, the number in the job will increase at a decreasing rate. The overall effect would be to stablize the number in the job where inflows equal outflows from attrition.

In this model, when a pilot leaves a job for reassignment, he must be trained for another job; he is not lost from the system. The training and allocation structure is driven by the need for pilots in a job skill. The overall system receives pilots via an undergraduate pilot training input. To complete the force structure, consider the effects of the need for personnel in another job. Figure 7 demonstrates the casual-loop structure for a job.

The remaining equations describing the force structure are the value initialization equations. The initial value equations establish values

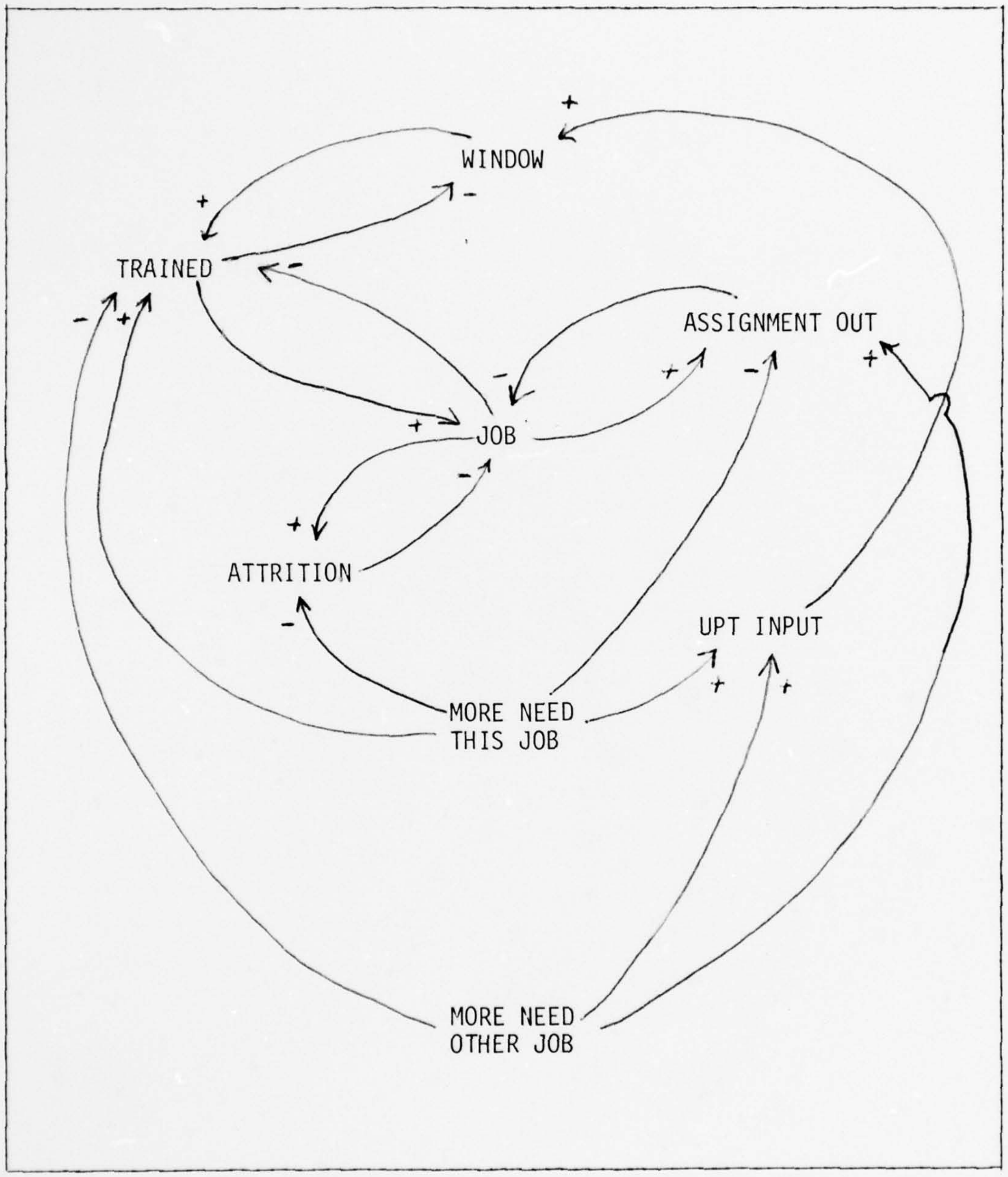

Figure 7. Casual-Loop Diagram for Completed Force Structure

for the force levels to start the model running in equilibrium, i.e., where all levels are maintained constant.

```
N          WIND = SUM(IWIND)                                    (13)
```

where

```
 WIND = pilots in reallocation process
IWIND = pilots in job for reassignment
```

```
N     IWIND(CAT) = ATT(CAT) + JOBI(CAT)/ATJC(CAT)               (14)
```

where

```
IWIND = pilots in job for reassignment
  CAT = category interation index
  ATT = pilot attrition rate by category
 JOBI = initial force size by category
 ATJC = average time in job by category
```

```
N      TRNG(CAT) = ATUPGD(CAT)*IWIND(CAT)                       (15)
```

where

```
  TRNG = pilots in training
   CAT = category iteration training
ATUPGD = average time in upgrade/reassignment pipeline
 IWIND = pilots in job for reassignment
```

```
N       JOB(CAT) = JOBI(CAT)                                    (16)
```

where

```
 JOB = pilots in each category
 CAT = category iteration index
JOBI = initial force size by category
```

```
N       ATT(CAT) = JOB(CAT)*ATTRATE(CAT)                        (17)
```

where

```
    ATT = pilot attrition rate by category
    CAT = category iteration index
    JOB = pilots in each category
ATTRATE = programmed attrition rate by category
```

By setting initial values for each category of the force (JOBI), the model starts off with no impetus for change—all model variables are at their goal. Since values for JOBI specify the number of pilots in each job, the initial attrition rate is specified as a percentage of the number in each job category (ATTRATE is a constant for each category of job). The initial window figure in each category is computed since average time in job (ATJC) is constant, JOBI is specified, and ATT has been computed. The initial window quantity is the sum of the initial window figures in each category. The beginning number in each training category uses the initial window figure times the average time in reassignment pipeline (a given constant). Figure 8 shows the composite representation of the force structure. Note that for each category of flying job (2-5) the logic is the same; however, the logic for the rated supplement changes in computation of the rates TOWIND and TOTRNG.

Pilot Production Pipeline. Refer to Figure 5 during the discussion of the pilot production pipeline. It will give a visual representation of this model area.

The pilot production pipeline determines the rate at which new UPT inputs enter the assignment window. It is the source of the external input of pilots into the system. The model beings with a recruiting rate for personnel (PREC) for pilot training [Eq (7)]. The recruiting rate is a function of the programmed annual UPT class size (CSIZE) and a recruiting capacity multiplier (MREC).

$$CSIZE.K = JOB.K(2)*TPINS.K \qquad (18)$$

where

CSIZE = annual UPT class size
JOB = pilots in each category
TPINS = UPT student/instructor ratio

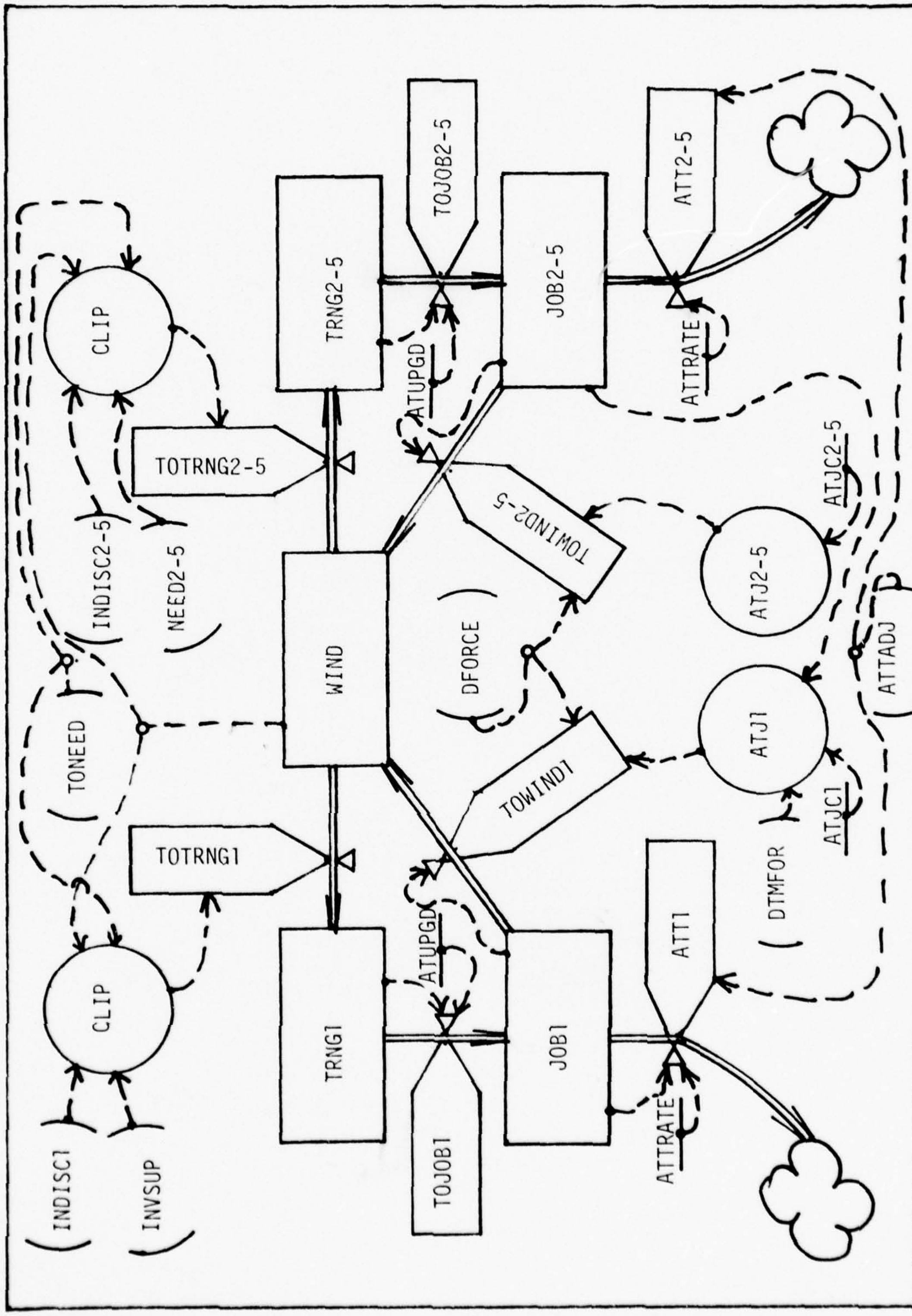

Figure 8. Force Structure

The annual UPT class size depends on the number of UPT instructor pilots [JOB.K(2)] and the student-to-instructor ratio (TPINS.K). The student-to-instructor ratio comes from a function specified by TPINS.K; it is a function of the difference between the desired and recent, actual UPT class sizes.

A TPINS.K = TABHL (TTPIR,TT.K,0,1.75,.25) (19)

where

TPINS = UPT student/instructor ratio
TTPIR = student/instructor ratio
TT = class size adjustment factor

T TTPIR = 0/.47/.94/1.41/1.88/2.35/3.15/4.0 (19.1)

where

TTPIR = student/instructor ratio

If the desired class size is larger than recent class sizes, the student-to-instructor ratio is allowed to increase in order to increase UPT output. The class size adjustment factor, TT, is used to determine the ratio between desired and recent class sizes (Figure 9).

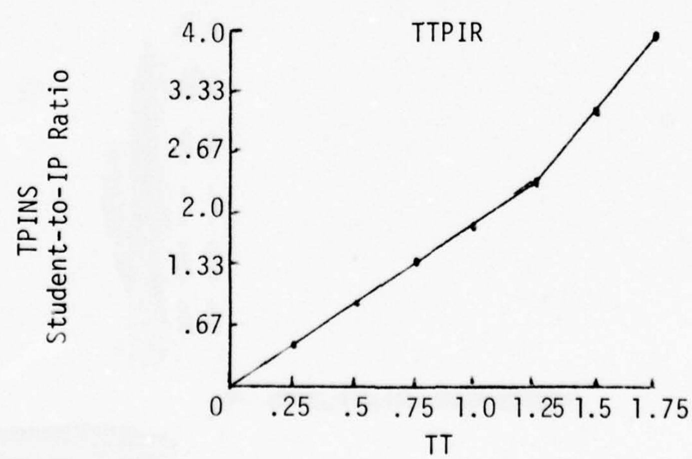

Figure 9. Class Size Adjustment Factor

$$\text{A} \qquad TT.K = DCSIZE.K/SMOOTH(CSIZE.K,TST) \qquad (20)$$

where

TT = class size adjustment factor
DCSIZE = desired UPT class size
CSIZE = annual UPT class size
ST = smoothing times

The adjustment factor increases if an exponential average of the class sizes for the last quarter is smaller than the desired class size (DCSIZE).

$$\text{A} \qquad DCSIZE.K = MAX(FORCE.K + PATT.K,VBL.K) \qquad (21)$$

where

DCSIZE = desired UPT class size
FORCE = programmed force size minus actual force size
PATT = projected annual attrition
VBL = class size for viable UPT operation

The desired UPT class size will be the maximum of the sum of FORCE.K and projected annual attrition (PATT) and a minimum class size for UPT operation (VBL). FORCE.K is the discrepancy between programmed force size and the actual force size. Hence, desired class size will replace the net of projected attrition and the objective force minus the actual force. However, desired class size will always remain large enough to keep a UPT operation sustained. The viable UPT class size is initialized as a constant (VBLC=400) arbitrarily and can be adjusted over time using the TEST8 equation.

$$\text{A} \qquad VBL.K = VBLC + TEST8.K \qquad (22)$$

where

VBL = class size for viable UPT operation
VBLC = minimum viable UPT class size
TEST5 = test on viable UPT class size

The desired student-to-instructor ratio is initialized by Eq (24).

N TPINS = TPINSI (23)

where

TPINS = UPT student/instructor ratio
TPINSI = desired student/instructor ratio

TPINSI is set at 1.88. For each UPT unit, a fixed number of instructors is needed in staff and academic roles. There is also a variable number of instructors needed, depending on the number of students. The overall factor is very close to 1.88 and can be verified by ATC planning documents.

The other part of the recruiting rate is the recruiting capacity multiplier (MREC). The recruiting rate is the quarterly recruiting capacity multiplier times one-fourth the annual UPT class size. The model assumes the availability of recruits for pilot training.

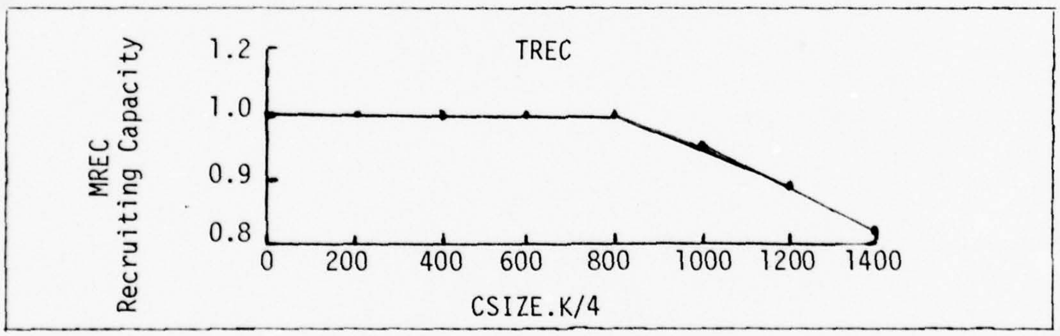

Figure 10. Recruiting Capacity Multiplier

A MREC.K = TABLE(TREC,CSIZE.K/4,0,1400,200) (24)

where

MREC = recruiting capacity
CSIZE = annual UPT class size
TREC = class size adjust factor for UPT recruiting

T TREC = 1/1/1/1/1/.95/.89/.82 (24.1)

where

TREC = class size adjust factor for UPT recruiting

It is assumed that the Air Force can meet a recruiting goal of 800 per quarter; after 800, a decreasing portion of the additional quota can be met. Limited resources and different recruiting capacities can be simulated by changing the values of the table TREC. The recruiting rate is the main inflow into the UPT rate (UPT.KL), Eq (6). The average time it takes to flow through the training process is the magnitude of the delay (TDEL.K).

A TDEL.K = CAP.K*DEL (25)

where

TDEL = average time to change UPT pipeline
CAP = capacity factor for UPT training delay
DEL = initial average time

This factor is based on a normal time (DEL=7) of just less than the two-year budgeting requirements and CAP.K the capacity utilization factor for UPT training delay. The capacity utilization factor increases throughout time for large annual class sizes and decreases the time for smaller class sizes. Annual class sizes of 2,000 give a TDEL of exactly seven quarters.

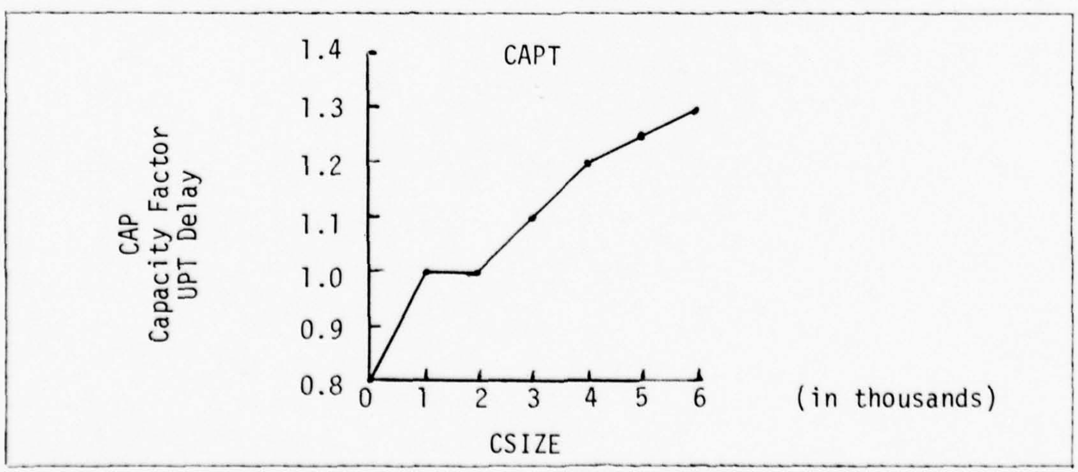

Figure 11. Capacity Utilization Factor

A CAP.K = TABHL(CAPT,CSIZE.K,0,6000,1000) (26)

where

CAP = capacity factor for UPT training delay
CAPT = capacity utilization factor UPT training delay
CSIZE = annual UPT class size

T CAPT = .8/1/1/1.1/1.2/1.25/1.3 (26.1)

where

CAPT = capacity utilization factor UPT training delay

A projected UPT graduation rate, PUPT.KL, is calculated for planning purposes. It uses an exponential of the UPT delay factor (PTDEL) over eight quarters (ST). The projected graduation rate is used to compute FORCE.K in the force management parameters. Force management parameters are discussed after the force size policy structure is introduced.

A PUPT.K = DLINF3(PREC.JK,PTDEL.K) (27)

where

PUPT = projected UPT graduates
PREC = pilot candidate recruiting rate
PTDEL = perceived training delay

A PTDEL.K = SMOOTH(TDEL.K,ST) (28)

where

PTDEL = perceived training delay
TDEL = average time through UPT pipeline
ST = smoothing times

Assignment/Reassignment Control. Assignment/reassignment control is a series of auxiliary equations that provide information to the decision about the assignment rate into training for each category (TOTRNG). First, selection for the rated supplement is discussed;

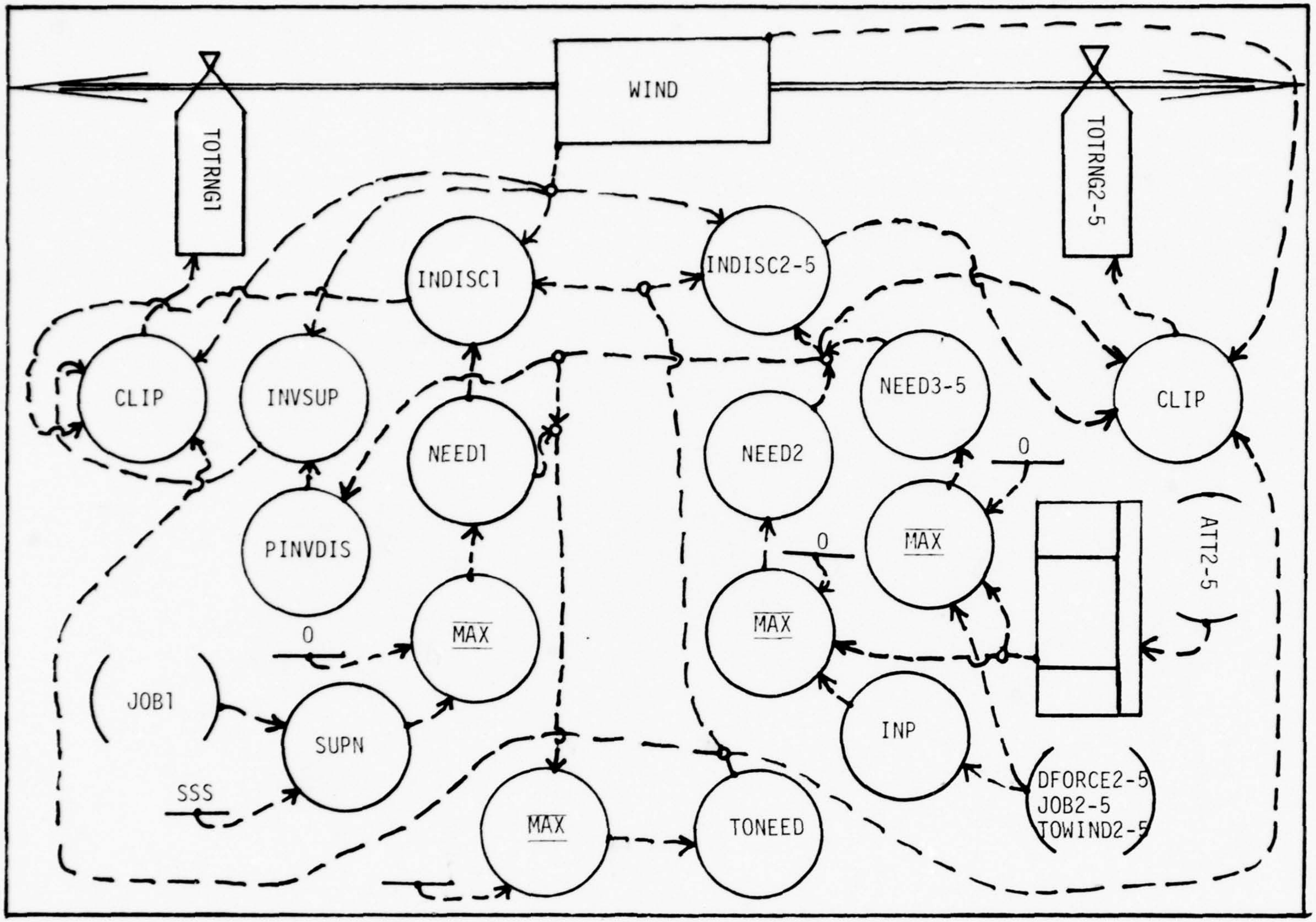

Figure 12. Assignment/Reassignment Control

next, the other four categories are discussed together. The number to be trained for rated supplement jobs is determined by Eq (8). Four values are needed to compute this rate—WIND, TONEED, INVSUP, and INDISC (1). WIND has previously been described as the level in the reassignment pool plus the rates TOWIND and UPT and minus the rates TOTRNG. The number in the reassignment window is compared to the total need (TONEED) to be met for other reassignments; the difference will be sent to the supplement.

A TONEED.K = MAX(1,SUM(NEED.K)) (29)

where

TONEED = total required personnel for assignment fills
NEED = personnel requirement in the rated supplement

TONEED is computed by a MAX function. It selects the larger number of one or the sum of the needs in the five individual categories. The need for each category must be computed. They result from three different equations, which all use the MAX function to avoid negative needs.

A NEED.K(1) = MAX(0,SUPN.K) (30)

where

NEED = personnel requirement in the rated supplement
SUPN = critical rated supplement

A NEED.K(2) = MAX((INP.K + SMOOTH(ATT.JK(2), AST)),0) (31)

where

NEED = instructor requirements
INP = projected instructor pilot needs
ATT = pilot attrition rate by category
ST = smoothing times

A NEED.K(MPIL) = MAX((DFORCE.K(MPIL) - JOB.K(MPIL)
+ TOWIND.JK(MPIL)
+ SMOOTH(ATT.JK(MPIL),AST)),0) (32)

where

NEED = pilot requirements by category
MPIL = index for noninstructor flying jobs
DFORCE = desired force size by mission
JOB = pilots in each category
TOWIND = assignment rate from pilot category
ATT = pilot attrition rate by category
ST = smoothing times

The need for the rated supplement NEED.K(1) is determined using a critical number which assumes that certain rated supplement jobs are absolutely critical to the Air Force mission (SUPN). This number is arbitrarily set at 500 (SSS) so that NEED(1) will be the difference between 500 and the number in the supplement JOB(1), if there are less than 500 in the supplement. Otherwise, NEED(1) will be zero. Normally, many more pilots than 500 are kept in the supplement to meet war-time surge requirements.

A SUPN.K = SSS - JOB.K(1) (33)

where

SUPN = critical rated supplement
SSS = viability level for rated supplement
JOB = pilots in each category

NEED(2) is instructor pilot requirements. It is a function of projected instructor pilot needs (INP.K) and a projected attrition from the instructor force. Instructor pilot needs are computed as the desired instructor pilot force size (explained in the section on force size policy) minus the number in the job plus the number leaving to the assignment window.

A INP.K = DFORCE.K(2) - JOB.K(2) + TOWIND.JK(2) (34)

where

INP = projected instructor pilot needs
DFORCE = desired force size by mission
JOB = pilots in each category
TOWIND = assignment rate from pilot category

NEED(MPIL) describes the requirements for the three pilot categories comprising the mission pilot force. It is computed in the same way as INP.K with an added factor for attrition. Separating these equations merely adds more flexibility to the model design. The sum of the five needs is the total need.

If the total need is less than the number of pilots in the assignment window, the rate to training for the supplement is equal to the pilots available for the supplement (INVSUP.K). If the number in the assignment window is less than the total need, then a share (INDISC.K(1)) is allotted to training for the supplement. INVSUP.K is computed as the number in the assignment window less those needed for flying jobs (PINVDIS.K). PINVDIS.K is the sum of the needs in all categories except the supplement.

A INVSUP.K = WIND.K - PINVDIS.K (35)

where

INVSUP = pilots available for rated supplement
WIND = pilots in reallocation process
PINVDIS = assignments to flying jobs

A PINVDIS.K = SUMV(NEED.K,2,TCAT) (36)

where

PINVDIS = assignments to flying jobs
NEED = personnel requirement in the rated supplement
TCAT = categories of pilot jobs

In the second situation, those assigned to training for the supplement is a proportion of the pilots in the window (INDISC).

A INDISC.K(CAT) = (NEED.K(CAT)/TONEED.K)*WIND.K (37)

where

INDISC = projected assignments to jobs
CAT = category iteration index
NEED = personnel requirement in the rated supplement
TONEED = total required personnel for assignment fills
WIND = pilots in reallocation process

The proportion is the ratio of the category need to the total need. Note that the need for the supplement is relatively small (normally zero) so that when those pilots in the window are less than the total need the rated supplement gets few or no inputs. This completes the discussion of the logic for the rate TOTRNG(1).

The logic for the other four categories (TOTRNG(PIL)) will now be discussed. See Eq (9). The only difference in the logic for these categories [from TOTRNG(1)] is if the total need is less than or equal to the number in the assignment window each category is allotted its need. The rest go to the rated supplement; that value is INVSUP.K as computed above.

The rated supplement thus acts as a reservoir to meet war time and contingency requirements. The model very closely approximates the actual requirements computation process of the pilot pipeline management system (Ref 2, 13).

Force Size Policy. The force size policy structure generates factors that set and adjust authorized force strength. The description of this area is organized around the rates TOWIND and is divided into two parts. The first part eminates from the rate to the window for all

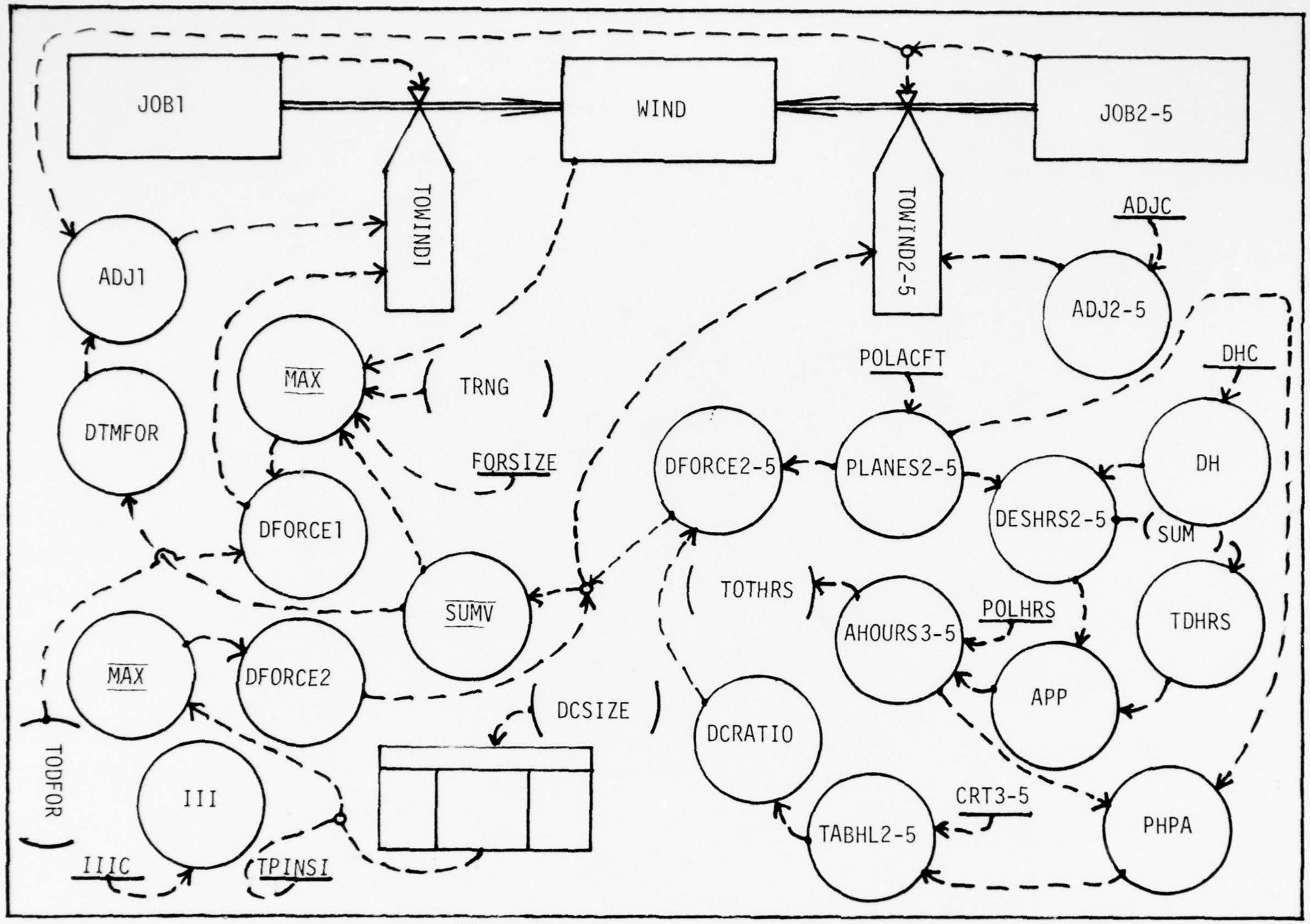

Figure 13. Force Size Policy

flying jobs (TOWIND(PIL)). The second part explains the rate to the window for the rated supplement (TOWIND(1)). See Eq (11) for a listing of TOWIND. It depends on the number in each job, an average time in job (ATJ), and the desired force in each job (DFORCE). The level JOB has been described previously. The variable ATJ will be discussed first, followed by DFORCE in both parts of the description in this section.

For all flying jobs, ATJ (2-5) is a constant ATJC. This constant is four years for UPT instructor pilots and three years for the core pilots; it can be varied with a test input, TEST11.

A ATJ.K(PIL) = ATJC(PIL)*TEST11.K(PIL) (38)

where

ATJ = average time in job
PIL = index for flying jobs
ATJC = average time in job by category
TEST11 = test on average time in flying category

This is set arbitrarily and should be varied as a desired exogenous variable in system.

The desired pilot force in each flying job (DFORCE) is computed differently for UPT instructor pilots and the mission pilots (MPIL). The desired force for UPT instructor pilots is a MAX function. It is the larger of the force based on desired UPT class size (DCSIZE) and the minimum viable instructor force size (III). Desired instructor force based on class size is calculated by taking the smoothed average of desired class size (DCSIZE) per quarter (CST=1) and dividing by the desired student-to-instructor ratio (TPINSI). This computes the number of instructors desired. Desired class size and student-to-instructor ratio have been explained in the pilot production pipeline description.

A DFORCE.K(2) = MAX((SMOOTH(DCSIZE.K,CST)/TPINSI),III.K) (39)

where

DFORCE = desired force size by mission
DCSIZE = desired UPT class size
ST = smoothing times
TPINSI = desired student/instructor ratio
III = minimum instructor force for UPT viability

The minimum viable instructor force size (III) is specified as a user input and can be modified with the TEST9 function. The normal value is 200 instructor pilots to accommodate five UPT bases.

A III.K = IIIC + TEST9.K (40)

where

III = minimum instructor force for UPT viability
IIIC = viable force level instructor pilot
TEST9 = test on instructor force minimum viability

The desired pilot force in each of the mission pilot categories is a function of the number of planes in each category times a crew ratio required to fly programmed hours (DCRATIO).

A DFORCE.K(MPIL) = DCRATIO.K(MPIL)*PLANES.K(MPIL) (41)

where

DFORCE = desired force size by mission
MPIL = index for noninstructor flying time
DCRATIO = desired crew ratio to fly programmed hours
PLANES = active aircraft by mission

A PLANES.K(MPIL) = POLACFT.K(MPIL)*TEST2.K(MPIL) (42)

where

PLANES = active aircraft by mission
MPIL = index for noninstructor flying jobs
POLACFT = active aircraft by category
TEST2 = test on number of aircraft

The number of mission aircraft assigned is a constant, POLACFT, and can be changed using the TEST2 function. No value for PLANES is used in the rated supplement or instructor force; zero values must be specified to prevent error statements in the program. The same is true for AHOURS, APP, DESHRS, DH, and DCRATIO.

The meaning of desired crew ratio has been modified for this model. It is a crew factor that combines the number of pilots per aircraft aircrew and the desired crew ratio. These figures are meant to be gross averages for the three mission categories giving the desired number of pilots per aircraft. For example, in the fighter, reconnaisance, miscellaneous category (FRM), a crew factor of 1.25 indicates an average of 1.05 pilots per aircrew with an average crew ratio of 1.19 per aircraft. The crew factor is the product of the crew ratio and number of pilots per crew. The value for desired crew factor for the FRM category comes from the crew table for crew fighters (CRT3).

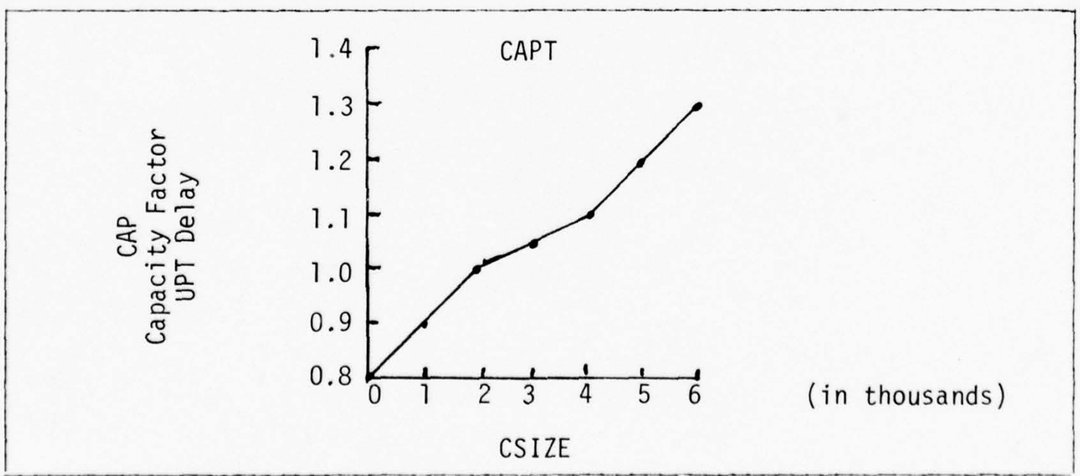

Figure 14. Crew Factor Diagram Fighter/Miscellaneous

A DCRATIO.K(3) = TABHL(CRT3,PHPA.K(3),0,120,20) (43)

where

DCRATIO = desired crew ratio to fly programmed hours
CRT3 = crew table fighters
PHPA = programmed flying hours per aircraft

T CRT3 = 0/.5/1/1.25/1.5/2/2.5 (43.1)

where

CRT3 = crew table fighters

As the flying hours per aircraft, PHPA, are increased so is the desired number of pilots per aircraft. See Appendix A for a similar discussion describing DCRATIO (4) and (5).

A PHPA.K(CAT) = AHOURS.K(CAT)/PLANES.K(CAT) (44)

where

PHPA = programmed flying hours per aircraft
CAT = category iteration index
AHOURS = authorized mission flying hours
PLANES = active aircraft by mission

Programmed flying hours per aircraft, AHOURS, is the authorized mission flying hours per category divided by the number of active mission aircraft, PLANES. PLANES is an exogenously determined constant.

A AHOURS.K(MPIL) = POLHRS*APP.K(MPIL)*TEST1.K(MPIL) (45)

where

AHOURS = authorized mission flying hours
MPIL = index for noninstructor flying jobs
POLHRS = total programmed flying hours
APP = flying hours apportioning factor
TEST1 = test on authorized hours

AHOURS is a function total programmed flying hours, POLHRS, and an apportioning factor, APP. It can be modified by the TEST1 function.

$$APP.K(MPIL) = DESHRS.K(MPIL)/TDHRS.K \quad \text{A} \tag{46}$$

where

APP = flying hours apportioning factor
MPIL = index for noninstructor flying time
DESHRS = desired flying hours per aircraft for proficiency
TDHRS = total desired mission flying hours

The apportioning factor is the ratio of the desired minimum flying hours for each mission category, DESHRS, to the total of the desired minimum flying hours for all mission categories, TDHRS.

$$DESHRS.K(MPIL) = DH.K(MPIL)*PLANES.K(MPIL) \quad \text{A} \tag{47}$$

where

DESHRS = desired flying hours per aircraft for proficiency
MPIL = index for noninstructor flying jobs
DH = desired flying hours per aircraft
PLANES = active aircraft by mission

The desired hours by category are dependent on the number of planes in each category and the desired flying hours per aircraft, DH. The desired hours per aircraft is an exogenous input, DHC, that can be modified by the TEST10 function.

$$DH.K(MPIL) = DHC(MPIL)*TEST10.K(MPIL) \quad \text{A} \tag{48}$$

where

DH = desired flying hours per aircraft
MPIL = index for noninstructor flying time
DHC = desired flying hours per aircraft for crew proficiency
TEST10 = test on desired flying hours

The total desired flying hours is the sum of the desired minimum flying hours for each mission category.

A TDHRS.K = SUMV(DESHRS.K,3,TCAT) (49)

where

TDHRS = total desired mission flying hours
DESHRS = desired flying hours per aircraft for proficiency
TCAT = categories of pilot jobs

The above sequence of logic generates the desired flying force size. This is an important factor in determining the rate of assignments out of a flying job. The other factors are the number in each job and the desired average time in the job.

The second part of the force size policy covers the rate at which pilots in the rated supplement enter the assignment window. The same basic equation for TOWIND applies; however, the average time in job and desired force are computed differently. The constant ATJC is three years. It is adjusted depending on how well the mission force is manned. The manning factor is given by the sum of all pilots in a flying job divided by the sum of the desired force size for flying jobs, DTMFOR. A higher manning ratio for the flying force gives a relatively longer average time in supplement jobs.

A ATJ.K(1) = ATJC(1)*(SUMV(JOB.K,2,TCAT)/
DTMFOR.K)*TEST11.K(1) (50)

where

ATJ = average time in job
ATJC = average time in job by category
JOB = pilots in each category
TCAT = categories of pilot jobs
DTMFOR = desired total mission force
TEST11 = test on average time in flying category

$$A \quad DTMFOR.K = SUMV(DFORCE.K,2,TCAT) \tag{51}$$

where

DTMFOR = desired total mission force
DFORCE = desired force size by mission
TCAT = categories of pilot jobs

$$A \quad DFORCE.K(1) = MAX(FORSIZE - SUMV(DFORCE.K,2,TCAT) - SUM(TRNG.K) - WIND.K,SSS) \tag{52}$$

where

DFORCE = desired force size by mission
FORSIZE = programmed total force size
TCAT = categories of pilot jobs
TRNG = pilots in training
WIND = pilots in reallocation process
SSS = viability level for rated supplement

The desired force in the rated supplement is a MAX function. It is never less than the viability level for the rated supplement (SSS=200). Normally, the desired force in the rated supplement is the remainder of the pilots after the desired flying force, those in training, and the assignment window have been subtracted from the desired force size.

Current Force Management Parameters. Current force management centers on adjusting the force size if it does not match the programmed force ceiling. The main ways to manage the force size stem from the inputs and outflows of the system. Since attrition seems to be the quickest way to impact the total force, discussion will begin with the equations which control the attrition rate. As noted before, pilot attrition by category, ATT, is a function of the number in each job category times a normal attrition rate (ATTRATE=.02/quarter) modified by an attrition adjustment factor, ATTADJ. The constant ATTRATE was chosen to be about the Air Force average of 8 percent per year. It is easily modified with the TEST4 function.

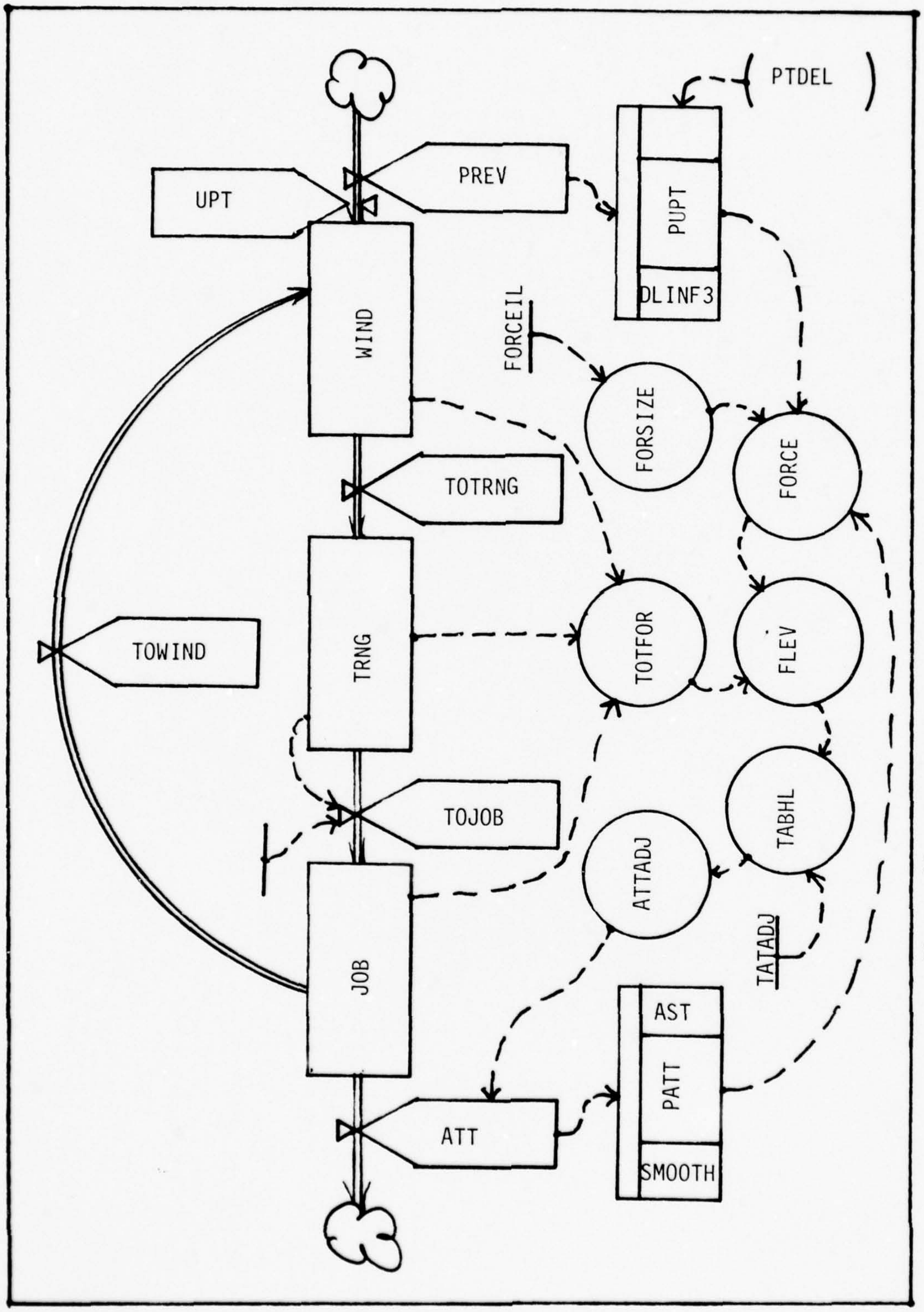

Figure 15. Current Force Management Parameter

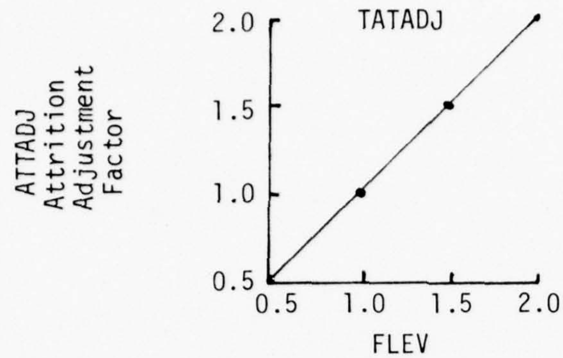

Figure 16. Attrition Adjustment Table

A   ATTADJ.K(CAT) = TABHL(TATADJ,FLEV.K,.5,2,.5)   (53)

where

ATTADJ = attrition adjustment factor
CAT = category iteration index
TATADJ = attrition rate adjustment table
FLEV = force level factor for attrition adjustment

T   TATADJ = .5/1/1.5/2   (53.1)

where

TATADJ = attrition rate adjustment table

The attrition adjustment factor increases attrition as the force level factor for attrition adjustment, FLEV, increases based on the relation specified by the TATADJ table.

A   FLEV.K(CAT) = (TOTFOR.K/(TOTFOR.K
+ FORCE.K))*TEST5.K(CAT)   (54)

where

FLEV = force level factor for attrition adjustment
CAT = category iteration index
TOTFOR = total pilot force
FORCE = programmed minus actual force size

The force level factor is a function of the total pilot force, TOTFOR, and the projected force discrepancy. The total pilot force is the sum of all pilots in the levels of the model.

A TOTFOR.K = SUM(JOB.K) + SUM(TRNG.K) + WIND.K (55)

where

TOTFOR = total pilot force
JOB = pilots in each category
TRNG = pilots in training
WIND = pilots in reallocation process

The projected force discrepancy, FORCE, subtracts from the programmed total force size the total projected pilot force.

A FORCE.K = FORSIZE.K-(TOTFOR.K-PATT.K) - 4*PUPT.K (56)

where

FORCE = programmed minus actual force size
FORSIZE = programmed total force size
TOTFOR = total pilot force
PATT = projected annual attrition
PUPT = projected UPT graduates

The actual force size, TOTFOR, minus a projected annual attrition, PATT, plus the projected annual input, 4*PUPT, is the projected annual force size. Thus, when the projected force is larger than the programmed force, the projected force discrepancy is a negative value. The projected force is a positive value when projected force is smaller than programmed force. Operating through FLEV, the attrition adjustment increases attrition when projected force is too large and reduces attrition when the projected force is too small.

A FORSIZE.K = FORCEIL + TEST7.K (57)

where

FORSIZE = programmed total force size
FORCEIL = Congress imposed pilot force ceiling
TEST7 = test on programmed total force size

Programmed total force size, FORSIZE, is a constant, FORCEIL, that can be changed by the TEST7 function.

The equation for the projected UPT graduates was described in the pilot production pipeline section. The equation for the projected annual attrition, PATT, is four times a smooth of the total quarterly attrition over the past four quarters, AST=4.

A PATT.K = 4*SMOOTH(SUM(ATT.JK),AST) (58)

where

PATT = projected annual attrition
ATT = pilot attrition rate by category
ST = smoothing times

III. Analysis and Results

This chapter documents the analysis and results of testing the PP/AMM. Determinations with respect to its validity are largely a subjective judgement (Ref 3:123). A judgement has to be made about how well the model generates behavior consistent with the pilot procurement/assignment management system in areas relevant to policy analysis. The model should show the direction and relative magnitude of major changes in system characteristics due to exogenous inputs or alternatives in policy. The results of the simulations used in the analysis are presented in this chapter under three main headings: general analysis, situational analysis, and policy forecasting analysis.

General Analysis

The first area of analysis introduces the cost module and discusses model equilibrium. This information provides a basis for further analysis.

Cost Module. This section describes the cost module attached to the model. The cost module was developed to provide relative cost information to help evaluate different management policies; it is not intended to give absolute estimates of future costs. Therefore, the numbers used are weighted averages and they are rounded off. Only current costs associated directly with the pilot resource that change with policy are included. For example, costs for allotted mission flying hours are not included. Management policy relative to the pilot resource should not change the cost of mission flying hours. Congress appropriates funds to pay for a specific number of mission flying hours. Mission flying hours are used for proficiency training. The total flying hours appropriated are always used in order to maximize pilot proficiency; management only impacts the proficiency flying hours available to each pilot, not the total cost. Conversely, pilot salary costs are included because management policies will impact the actual force size. An increasing force size will tend to increase the total salary cost. The cost module monitors six types of flows. It also accumulates total costs and total discounted costs.

The first cost category covers recruiting, precommissioning training, and accession travel costs (RCOST). The three sources of commissioning for Air Force pilot acquisitions are the USAF Academy (USAFA), Reserve Officer Training Corp (ROTC), and Officer Training School (OTS). The model does not attempt to discriminate between acquisitions by source. The actual ratio of each source varies, as does the actual cost per graduate. The costs in this area were taken from Air Force Manual (AFM) 173-10. The cost of a USAFA graduate is more than eight times the cost of an OTS acquisition. However, the USAFA graduate will enter active service whether or not he or she becomes a pilot resource. The majority of this RCOST is not influenced by the management of the pilot force. Similar arguments may be made about the RCOST for the other pilot acquisitions. Obviously, management of the pilot resource does influence the number of acquisitions needed in the Air Force. For this reason, the RCOST element is set approximately equal to the typical acquisition cost of an OTS graduate (the smallest of the three sources). See Table I for a compilation of this cost. The level RCOST.K is increased by the increment RECR.J. The term RECR.K is equal to RCR.K times the number of recruited pilot candidates each quarter. Note the level RCOST is a cumulative figure; and, for ease of model manipulation, RCF.K is equal to the constant RCFK, which is $13,000. The same computational scheme is used in each of the six cost areas.

TABLE I

RCOST

Source	Precommissioning Cost	Recruiting Cost	Accession Travel
USAFA	$103,000	$1,100	$800
ROTC	13,800	1,100	800
OTS	11,100	1,100	800

Figures are rounded to nearest 100.

A RECR.K = PREC.K*RCF.K (59)

L RCOST.K = RCOST.J + DT*RECR.J (59.1)

N RCOST = 0 (59.2)

where

RCOST = recruiting costs

The next area accounts for UPT costs for each student (UCOST). The cost of UPT is taken from data used in the DPXXA computer model used at the Pentagon and verified by Captain Michael Carpenter of the AF Manpower and Personnel Center (AFMPC). The variable UPTT.K produces the total UPT cost by using the number of UPT graduates (UPT.JK) times the cost per graduate (UCF.K=$235,000). After UPT, additional specialized training is required and is accounted for in the next category.

A UPTT.K = UPT.JK*UCF.K (60)

L UCOST.K = UCOST.J + DT*UPTT.J (60.1)

N UCOST = 0 (60.2)

where

UCOST = UPT costs

The same source is used for the cost data for specialized training. This area accounts for Combat Crew Training Schools (CCTS) and any other training such as Squadron Officer School (SOS), Instructor Pilot Instrument School (IPIS), and Aircraft Commander Upgrade School (PUPS). All specialized training is accounted for. The cost of specialized flying training is overwhelmingly significant. The average cost of the first CCTS is about $248,000. The cost of nonflying training is negligible in comparison. The average cost used for all specialized training in the module is $215,000 (TCF.K). This is approximately a 15 percent reduction of the CCTS cost and reflects about a 15 percent rate of nonflying training. The variable TCOST accumulates the specialized training costs. It is added incrementally by multiplying the average cost times the number of pilots leaving training, SUM(TOJOB.JK).

A	TRAIN.K = SUM(TOJOB.JK)*TCF.K	(61)
L	TCOST.K = TCOST.J + DT*TRAIN.J	(61.1)
N	TCOST = 0	(61.2)

where

TCOST = CCTS cost

The fourth cost area accounts for the additional expenses associated with permanent change of station (PCS) and temporary duty travel (TDY) (PCOST). The data for these costs comes from AFM 173-10. The PCOST increment, PCS, equals the number of pilots in the assignment window times the additional expenses factor, PCF.

A	PCS.K = WIND.K*PCF.K	(62)
L	PCOST.K = PCOST.J + DT*PCS.J	(62.1)
N	PCOST = 0	(62.2)

where

PCOST = PCS costs

The PCS cost per move for officers in fiscal year (FY) 1978 is $3,171. The TO/FM Other Flying factor is $1,364. A weighted average is used which sets PCF.K equal to $2,000. Less than half of the moves are considered to be PCS. All other costs associated with TDY and PCS travel are considered accounted for in the TCOST area.

The next area accounts for active duty pay. There is a wide range of pay grades within the pilot resource, but the model does not distinguish between pilots by pay grade. Therefore, the AFM 173-10 rated pay factors table provided the salary that is used. Actual average pilot salary is quite variable over time since, as retention declines, the average pay would decrease with the age mix of the pilot force. An annual factor of $24,000 ($6,000 quarterly) is drawn from the pay factor table to account for average pilot salary, SCOST. The quarterly salary cost, SAL.K, is the total active force, TOTFOR.K, times the average salary factor per quarter, SCF.K=$6,000. SCOST is then the aggregate of the quarterly costs for salary.

A $\quad$ SAL.K = TOTFOR.K*SCF.K $\quad$ (63)

L $\quad$ SCOST.K = SCOST.J + DT*SAL.J $\quad$ (63.1)

N $\quad$ SCOST = 0 $\quad$ (63.2)

where

SCOST = pilot salaries

The last of the six cost areas adds the cost of attrition to the pilot resource. A pilot promoted from lieutenant colonel to colonel, or a pilot removed from flying status is considered a loss to the pilot force in the model. Either of these cases may or may not have any cost. A certain amount of attrition results from factors (such as retirement) that management policy only indirectly effects. The cost factors applied to attrition were based mainly on involuntary separations and come from AFM 173-10. The possibility of a RIF and the associated cost is not considered. However, in any large scale force draw-down, RIF pay may become a factor that should be considered. In this module, attrition costs (ACOST) is computed by adding the increment ATCST.K for each quarter.

A	ATCST.K = SUM(ATT.JK)*ACF.K	(64)
L	ACOST.K = ACOST.J + DT*ATCST.J	(64.1)
N	ACOST = 0	(64.2)

where

ACOST = attrition costs

ATCST.K is the total number of pilots attrited from the pilot force, SUM(ATT.JK), times the attrition cost factor, ACF.K. The attrition cost factor is set to $2,500, which is about equal to the average separation travel pay. This will be the cost allotted to any pilot attrition regardless of the actual reason.

Total cost, TOTCOST, is merely the sum of the six individual cost areas. It represents the total accumulated cost.

A TOTCOST.K = SCOST.K + PCOST.K + TCOST.K + UCOST.K
+ RCOST.K + ACOST.K (65)

where

TOTCOST = total cost

The units of cost are based on constant FY 1978 dollars and are not adjusted for inflation.

The final area of the cost module computes a total cumulative cost discounted at a 10 percent annual rate. The discount factor, DFACT, is computed as exp(-0.025t). The costs are summed each quarter as QTRCST. The discounted quarterly cost, DQTR, is then the product of the discount factor and the total quarterly cost. The discounted total cost, DCOST, is the discounted sum of all the quarter cost flows.

A DFACT.K = 1/EXP(.025*TIME.K) (66)

where

DFACT - discount factor

A QTRCST.K = SAL.K + PCS.K + TRAIN.K + UPTT.K + RECR.K + ATCST.K

A DQTR.K = QTRCST.K*DFACT.K

N DCOST = 0

L DCOST.K = DCOST.J + DT*DQTR.J

where

DCOST = total cost discounted

This cost module will provide relative cost information to aid in the analysis of model behavior caused by different environmental and policy factors.

Model Equilibrium. During the initial investigation of system behavior, it is necessary to study the system in equilibrium. There are a number of reasons to study the model in equilibrium. The attainment of equilibrium provides some assurance that the general formulation of the computer model is consistent with the negative feedback structure of the conceptual model. It is important to start the model in equilibrium so that when the system is disturbed one can observe the exact response of the system to the particular perturbation. The same responses may be present under disequilibrium conditions but could be obscured by confounding oscillations in the system. Also, the system costs in equilibrium provide a good basis for analysis of policy changes within the system. In equilibrium, the inherent stability (instability) of the system could easily be demonstrated and formulation problems in the system can be identified.

Equilibrium in the PP/AMM is represented by a state in which all force levels remain constant over time, the desired force levels are exactly met, and the accession rate for UPT would provide an input to equal a constant system attrition rate (the system output). In addition, all management goals would be met. These goals are explained in the model description. It should be reemphasized at this point that the baseline force set up in this model is hypothetical.

To initialize the model, consider the force needed to man the mission aircraft at the levels which will fulfill mission requirements. To compute this, the pilots in job levels three through five are set equal to the desired crew ratio times the number of aircraft for each level (Table II). Next, select any reasonable force size for the rated supplement. A reasonable rated supplement size is large enough to support the supplement requirements to support contingency planning needs, but never smaller than the minimum viable supplement size of 500. The number chosen for this hypothetical force is 3,425 pilots.

Also shown in Table II is the computational scheme for the initial size of the UPT instructor pilot force given the mission force and supplement sizes. The constant annual attrition rate of 8 percent is shown on the right. The annual production of accessions is shown on the left. These equations insure all management goals are met.

TABLE II

Initial Equilibrium Job Levels

Force Area	No. of Aircraft	Desired Crew Factor	JOBI	2/45*JOBI
1	-	-	3,425	152.2
2	-	-	*640	-
3	3,500	1.25	4,375	194.4
4	1,000	3.0	3,000	133.3
5	900	4.0	3,600	160.0
sum:			15,040	*640.0

$$\text{JOBI}(2) \times \text{TPINSI} = \sum_{i-1}^{5} \text{JOBI}(i) \times (\text{ANNUAL ATTRITION}) \qquad \text{(II-1)}$$

$$\text{JOBI}(2) \times 1.88 = \sum_{i=1}^{5} \text{JOBI}(i) \times (.08) \qquad \text{(II-2)}$$

$$\text{JOBI}(2) \times 1.80 = \text{JOBI}(1) \times (.08) + \sum_{i=3}^{5} \text{JOBI}(i) \times (.08) \qquad \text{(II-3)}$$

$$\text{JOBI}(2) = \text{JOBI}(1) \times (2/45) + (2/45 \times \sum_{i=3}^{5} \text{JOBI}(i)$$
$$= {}^*640 \qquad \text{(II-4)}$$

where JOBI is the initial condition for the number in each job category and TPINSI is the desired student-to-UPT instructor rates.

*The sum is equal to JOBI(2).

Now, the rest of the level equations in the model can be initialized. These equations are given in Table III. The quarterly attrition rate and average time in job constants are system goals. The average time in training for each category was derived from command training requirements and is a gross average for all training and aircraft in each category. It includes all the time rquired for travel, in-processing, local base level training, and other delays that exist in the system. The figures in the levels represent pilots, but the continuous nature of the systems dynamics methodology causes fractions to be computed.

Next, examine the equations in Table II. It is evident that in equilibrium any increase in the annual attrition rate will require a larger number of UPT instructor pilots, JOB(2), if the desired UPT student-to-instructor ratio, TPINSI, is maintained. From Eq (II-3), Table II, it can be seen that an increase in the desired value of TPINSI will decrease the number of instructors required (and vice versa).

Examination of Table III also leads to some relevant conclusions. The percentage of the total pilot force in the assignment window and training pipeline is quite large—over 21 percent. Thus, a significant part of this hypothetical pilot force is in the reassignment pipeline and represents a loss of useful manpower to the system. The relationships of all the variables are very evident when all others are held constant. However, very little intuition is required to see that when these variables and others in the system begin to vary simultaneously in different directions it is impossible to tell what outcomes will result. This is one of the main reasons to use the systems dynamics approach. Appendix B contains an example of the model run in equilibrium, followed by a complete listing of the model.

TABLE III

Initial Equilibrium Values

Category	JOBI	ATTRATE	ATT	ATJC	JOBI/ATJC	*WIND	ATUPGD	*TRNG	LEVELSUM
1	3,425	.02	68.5	12	285.4	353.9	1.0	353.9	4,132.8
2	640	.02	12.8	16	40.0	52.8	1.3	68.6	761.4
3	4,375	.02	87.5	12	364.6	452.1	1.9	859.0	5,686.1
4	3,000	.02	60.0	12	250.0	310.0	2.2	682.0	3,992.0
5	3,600	.02	72.0	12	300.0	372.0	1.4	520.8	4,492.8
TOTAL	*15,040					*1,540.8		*2,484.3	19,065.1

N JOB(CAT) = JOBI(CAT) (III-1)

N ATT(CAT) = JOBI(CAT) x ATTRATE(CAT) (III-2)

N IWIND(CAT) = ATT(CAT) + JOBI(CAT)/ATJC(CAT) (III-3)

N TRNG(CAT) = ATUPGD(CAT) x IWIND(CAT) (III-4)

where JOBI is initial condition for each job category; ATTRATE is quarterly attrition rate goal; IWIND is initial condition for the number in the window each category; ATJC is average time in job constant each category; and ATUPGD is average time in training constant for each category.

*Denotes level quantities to be summed.

Situational Analysis

Build-Up Analysis. There are four specific situations that have been simulated for analysis: force build-up, force draw-down; a combination resembling the Korean War to present, and increased force attrition. A force build-up scenario is simulated to compare with the change in force size requirement experienced in the 1965 to 1967 time frame. During that period, the Vietnam build-up increased pilot resource requirements by about 9,000. The simulation actually sets as a goal the doubling of the mission pilot force. This is allowed by increasing the imposed force ceiling by 10,975 and doubling the authorized flying hours. This assumes no large acquisitions of aircraft for a limited conflict. The pilot force is increased on this basis, and no other model parameters are changed. The decision to build-up is inserted between the fourth and fifth quarters of the simulation. See Appendix C for the model output of the simulation.

The number of pilots in rated supplement drops very rapidly as the need for more pilots begins. The number goes from 3,425 to 753 in the first year and down to 385 the next year; its minimum is 318 in the third year. The level of pilots in the rated supplement oscillates at about four and one-half year intervals twice and dampens to equilibrium 13 years after the initial perturbation. The supplement seems to fit its role very well. It does not build up again because of the limits imposed on the force ceiling and, in fact, it goes to the minimum viable level for the rated supplement (500).

The UPT instructor force reacts in the opposite direction from the rated supplement. Initially, it builds up in order to cope with the increased production requirements that are imposed. It attains a maximum of 2,990 instructor pilots about 3 years after the new requirements are imposed; it then drops to its minimum viable level (400) in about 7 years and stabilizes at about 995 in 13 years after the build-up decision. The instructor force reacts consistently with our expectations. It increases to fill added needs and stabilizes to maintain the increased attrition implicit in the increased force level.

The three mission force levels all react in the same manner. They build quickly as the rated supplement is depleted to support the build-up. Then, their rate of growth decreases until the UPT instructor force is able to impact force growth. This takes two and one-half years. Then the mission force grows rapidly, overshoots its equilibrium value slightly, and finally reaches equilibrium about eight years after the initial build-up input. The final equilibrium values are listed in Table IV.

TABLE IV

Force Build-up Equilibrium Values

	Final Level	Original Level
Rated Supplement	456	3,425
UPT IP	995	640
FR	8,743	4,375
BT	5,995	3,000
C	7,194	3,600
Total	23,383	15,040
Total Force	30,040	19,065

Since the force ceiling was raised by 10,975 pilots, the desired mission force levels are slightly greater than the equilibrium force levels.

This occurs because the mission force is allotted only a proportional share of the available pilot resources when there are not adequate pilot resources to fill all needs. In this case, the rated supplement is driven below the minimum viable level. This unfulfilled need causes the smaller percentages to be allotted to the mission job categories. Some mission capabilities are sacrificed in this situation. A corrective action would be to raise the force ceiling.

The plot of training levels seems to react as expected. A dip in the number in training occurs two or three quarters after the force build-up decision. This is the time when the rated supplement inputs play-out, and UPT input has not yet caught up. The cause of the UPT delay is more easily seen on the next plot.

The delay between the decision to recruit more UPT entrants and when the graduation rate catches up is about two years. UPT class sizes are budgeted two years in advance. The course is then one year long; therefore, the delay used here allows for a good deal of flexibility for graduating different quality pilots. If quality constraints are firm, then the budgeting process will have to become more flexible. The author assumes either of these techniques could be applied. The large fluctuation in the student-to-instructor ratio is a noteworthy characteristic of a sudden force requirement change.

The last plot shows the relationship of crew ratios to desired crew ratios. It takes five years for crew ratios to reach the desired levels. This indicates individual pilots would be flying much more than peace time goals. The maximum hours flown per pilot in a quarter is 80 (HFPP(CAT)). This is far from any imposed limit.

Table V gives the cost comparison for this change from equilibrium. The cost is given through the ten-year point and accounts only for the factors discussed in the cost module section. It is not conceivable this type of force change would last for ten years. After even one or two years, other major force structure changes would have to be made.

TABLE V

Cost of Force Build-up Scenario

Cost in Millions	2 years		5 years		10 years	
	TOT	DCOST	TOT	DCOST	TOT	DCOST
Equilibrium	2,096	1,998	10,482	8,262	20,964	13,272
Build-up	2,096	1,998	12,261	9,443	30,199	18,161
Added Cost	-	-	1,779	1,181	9,235	4,889

Comparing costs in this scenario serves mainly to introduce the magnitudes under consideration. A feeling for the change in cost of pilot resources appears realistic based on current factors.

This simulation verifies succinctly the several modes of behavior exhibited by the model and the system. It shows the importance of the imposed force ceiling and demonstrates the behavior of the allocation logic in the model. Not only does the distribution of pilot resources work correctly, but the job categories all behave as system logic requires.

Draw-Down Analysis. The force draw-down scenario simulates a force reduction from 30,053 to 19,065. It represents a decision to reduce the total pilot force. This is accomplished by reducing the desired force size by 10,988 pilots and simultaneously reducing the number of aircraft by one-half. The total allotted flying hours are reduced by one-half to adjust the flying hours to the number of aircraft and force size. The resulting force is comparable to the equilibrium force previously discussed.

The mission force is cut by one-half from equilibrium manning levels. The UPT instructor level is in equilibrium for the beginning force size. The rated supplement is near a minimum, as it would be at the end of a conflict period. The decision is made between the fourth and fifth quarters to reduce the force.

Appendix D presents the results of the simulation. The total force experiences about 12 percent per year attrition and in about 12 years reaches the desired level. The mission force drops to desired levels within a year and a-half with a slight undershoot initially, and the UPT instructor force drops to nearly a minimum viable level in the same period. The rated supplement builds rapidly as it is designed to do; however, as the mission force levels out, the rated supplement attrition begins to drop the total force level. The majority of the force reduction comes from the supplement after one to two years. This continues until the total force size is small enough to allow the desired force size in the supplement to increase to the equilibrium point. Note that at this time the UPT instructor force and rated supplement begin dampened oscillations with five-year periodicity into equilibrium. The UPT instructor force begins an upswing just less than two years after the rated supplement, which reflects the delays caused by budgetary planning policies in pilot production.

The system manages the reduction in force quite well. The rated supplement and UPT instructor force vary as they were designed to do in order to maintain the desired force levels. The oscillations in the system levels are the result of information and training delays inherent in the system.

The next two plots in Appendix D show the changes in the numbers in the assignment window, training, recruiting, and UPT production levels. Initially, after the force draw-down decision, few pilots are trained in these categories; after about two years, the training rates again stabilize to maintain an experienced force. Flow rates into the rated supplement vary with the size of the supplement, as observed during real force draw-downs. The training rates for the UPT instructor pilot force change as needed to provide a force in equilibrium. Finally, desired crew ratios are established and maintained within two years.

The costs of the draw-down simulation are compared to a simulation of maintaining the original force in equilibrium. Figure 17 gives a simple representation of the total *cumulative cost differences*. Appendix E presents the results of the equilibrium simulation for this force before draw-down for a 25-year period.

The total cumulative cost of the draw-down scenario is higher than the cost of maintaining the original force in equilibrium until the 20-year point for total cost and beyond 25 years for total discounted cost. That is, no money is saved initially by reducing total force size; it is not an economy measure. The added training and attrition costs offset the savings in salary when the pilot force is cut back. One thing that biases this result is the fact that the cost module does not include retirement costs.

<u>Historical Simulation Analysis</u>. The third situation simulates the pilot force posture from 1957 to the present time. The force requirement and actual inventory are depicted graphically in Figure 18. The

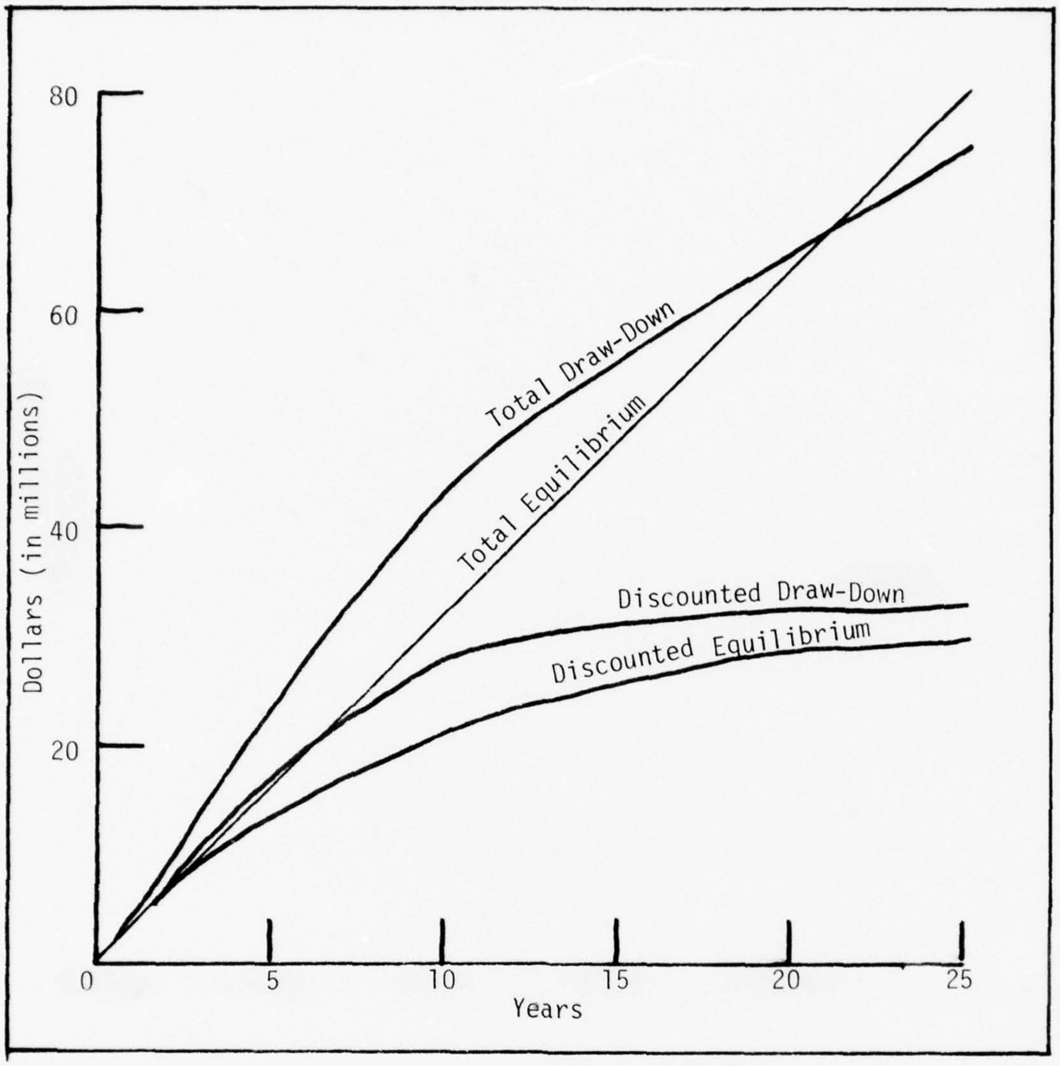

Figure 17. Equilibrium Draw-Down Cost Comparison

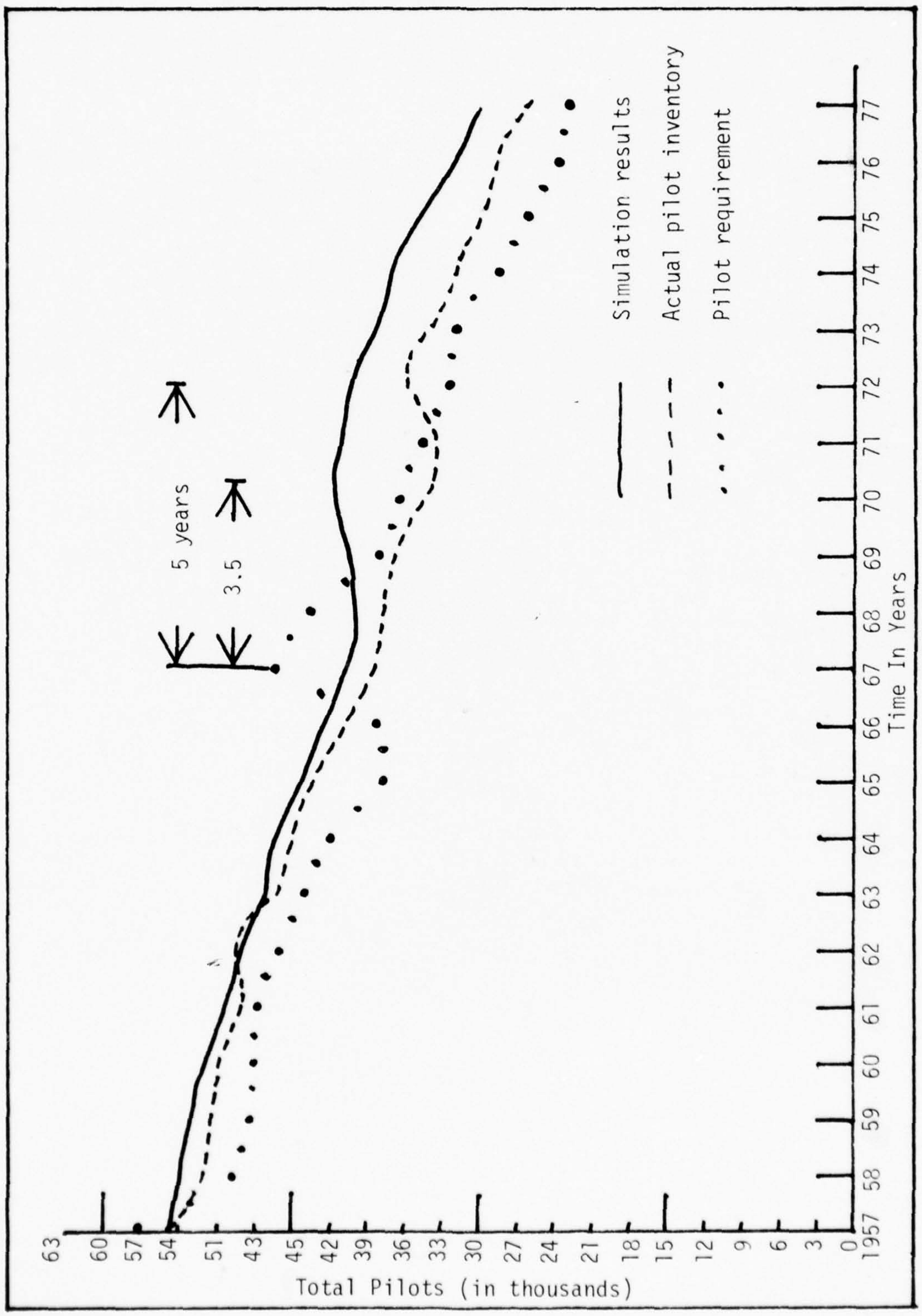

Figure 18. Korean War to 1977

force requirement draws down through 1965, experiences the Vietnam build-up to 1967, and then draws down to its current level. The actual inventory generally lags by about one and one-half years and seems to react to the increased Vietnam force requirements with a five-year lag.

The simulation was accomplished by initializing the five job categories at 9,000, 1,155, 13,125, 9,000, and 10,800, respectively. This generates an initial total force of 54,747 which is near the actual 1957 level. This simulates a force beginning to draw-down. The desired force ceiling was approximately 57,300; and this is set into force ceiling as the model is initialized. The force ceiling, mission aircraft, and allotted flying hours are then changed proportionately to follow a force size profile near to the requirement shown in Figure 18. The simulation results are given in Appendix F.

The levels throughout the simulation react as described in the build-up and draw-down situations. Using this scenario, the ability of the model to simulate the historical system behavior can be tested. The actual pilot requirements and actual inventories are plotted with the simulation results in Figure 18. The model output follows the actual inventories very well. Initially it lags slightly behind, and as simulation time increases the lag becomes greater. The Vietnam build-up is seen earlier than the actual system variation. This is not surprising since decision-making and action time delays are often underestimated in modeling. Also, the level aggregation in the model tends to cause the natural periods of the model to be shorter than the actual system. The relative magnitude of the Vietnam build-up in the simulation is slightly larger than shown by the actual system. The significant point is that the model reacted properly. The actual magnitude of the change is not as important. The usefulness of the PP/AMM model is more dependent on the proper mode of reaction than the specific magnitude of the reaction. The model is designed as a management tool for policy analysis and not as a tool for forecasting force sizes.

The model output in the appendix also demonstrates how the system maintains a fairly stable desired mission force. The rated supplement and UPT instructor force in the model respond as they have in the real system. Some difference between the model behavior and real world system behavior is to be expected, deriving from background "noise" in the real world system. The important fact is the model is not meant to predict the future but to represent the behavioral characteristics of the real system under a given policy structure.

Attrition Analysis. The fourth situation is actually a series of computer runs to show the effect of increasing attrition on the system. They are presented in Appendix G. The step increase makes the changes in the system more visible. The system reaction is the same in all cases with larger changes as the attrition rate increases. Each time the system equilibrates with all job categories, except the UPT instructors, increasing to maintain the desired total force size. The number in training, including UPT students, oscillates for about ten years.

A sudden change in the system, as presented here, is not likely; however, a possibility exists for this to happen if drastic policy changes occur. The costs are initially lower when attrition is increased, but they always become greater cumulatively after three to seven years if desired force levels are maintained. The initial savings is due to less salary cost when the force is below the desired level. However, a short fall in the mission force may be unacceptable even if it produces some savings.

Probably the most important point to notice from this situation is how the number of pilots in jobs decreases as attrition increases. That is, higher attrition rates force the system to put more pilots in the assignment window and in training to preserve equilibrium. Since the desired force size is maintained, less pilots are available to fill jobs (Figure 19). The number in the three mission categories is the same in each case since the model will fill the mission jobs whenever possible. The changes are in the rated supplement and UPT instructor force; the change in the total number of pilots available for jobs can be seen as the sum of the changes in these two job categories. As attrition increases one percent, the rated supplement is reduced by about six hundred pilots, and the UPT instructor force required is increased by about three hundred. The net loss to the job force is about three hundred pilots. The increased attrition has drawn pilots from the rated supplement to fill additional instructor positions, and more pilots are required to be in training at all times to fill additional job openings forced by the attrition.

Policy Forecasting Analysis

Forecasting is actually highly subjective; it is based on skill, experience, and judgement. It is an attempt by a decision-maker to detect future events. No information about the future can be certain. The uncertainty associated with forecasted information implies the information may not be useful. In fact, forecasted information can influence a system negatively.

Usually, a forecast is accomplished by assuming the information about the behavior of the recent past is persistent. Trends or behavior

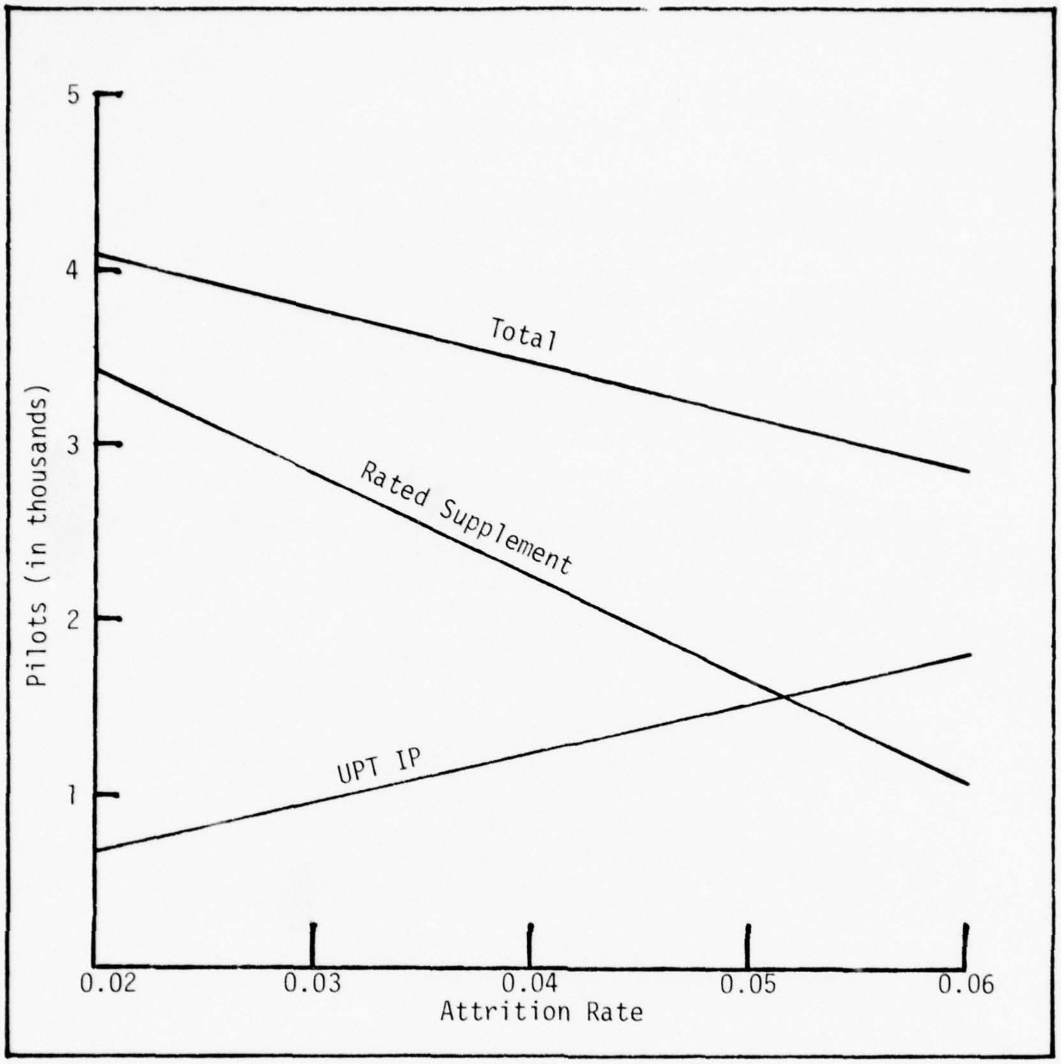

Figure 19. Attrition Rate vs UPT, IP, and Rated Supplement

found in this information are extrapolated into the future. The method used to forecast in the PP/AMM is described in Appendix L of J. W. Forrester's Industrial Dyanmics.

For this analysis, random noise was introduced into the equilibrium model in the attrition outflow. The attrition outflow is varied via a random, uniform distribution within the limits of ±10 percent. In addition, the attrition rate was doubled at the 48-quarter point to introduce a perturbation for analysis.

Noise is the effect of random and unpredictable external factors on a system. It exists in all decision points in any system (Ref 3:108). The decision functions in the model have been simplified as a matter of modeling necessity. Factors with only a slight influence on variables that are part of the system and external factors independent of the real system have been left out. Noise simulates the addition of these factors. For a discussion of the NOISE function, see the DYNAMO User's Manual. The simulation results are presented in Appendix H.

The effect of noise on the model is minimal. It remains very stable and exhibits little change from previous runs without noise. The model reacts the same to the doubling of attrition with or without the effect of noise. For example, the magnitude of the change in total force varies less than 0.2 percent at the point of maximum difference. The periods within the system do not change nor do the relationships between any of the variables in the model. This indicates the pilot production allocation system is a very flexible and effectively managed system.

In order to provide an example of policy change and forecasting, information for projected attrition, PATT, is replaced by forecasted attrition, FATT. Then, forecasted attrition is used to determine desired UPT class size, DCSIZE, and programmed minus actual force size, FORCE. The attrition in the last two quarters is used to forecast attrition forward four quarters from the present time.

The effect of the forecasted information is shown in Appendix I. The model reacts to noise and doubled attrition approximately as before, and the equilibrium values are essentially the same. When attrition doubles, the number in total force drops and then rises past the desired level, then oscillates back into equilibrium. However, in the simulation using forecasted information, the total force drops to only about 90 percent, as low as previous simulations, and returns through the desired force level in three years (one year prior to the previous simulations). It overshoots the desired force level by more than five times the previous simulations, but then stabilizes with smaller deviations than noted earlier. The number of pilots in the core forces goes lower in the simulation using forecasted information while the supplement and the UPT instructor forces remain larger than before.

The system cost using forecasted information is higher primarily since more pilots are recruited and trained. Even the discounted cost at 25 years is $100 million greater in the simulation with forecasted attrition.

Thus, forecasting information (with the technique used) does not seem to be worthwhile in this case. Increased costs, smaller numbers in the mission force, a greater overshoot of the desired total force level, and the uncertainty associated with forecasting overshadow the quicker reaction back to the desired total force level. Analysis of other types of forecasting techniques are beyond the scope of this thesis.

IV. Conclusions and Recommendations

In this chapter, the model is summarized briefly and its usefulness as a management tool is described. The conclusions derived from the research are stated and, finally, some recommendations for further study are suggested.

Model Summary

The PP/AMM maintains the pilot force so that the required primary mission forces are filled to the maximum extent possible. The rated supplement is to reduce any short-fall within the core forces as soon as possible. The supplement holds excess pilot resources when they are available, and, of course, a certain number of pilots are necessary in the supplement to fulfill the requirements for contingency planning. The UPT instructor force is maintained to provide the ability to replace pilot attrition and to provide new pilots for increased needs within the system. The system includes the pilots in these jobs and pilots in the assignment/training pipeline. In order to sustain such a complex system, a large number of pilots are always in the pipeline. The pipeline aggregates delays for processing, travel, training, and leave. The model represents the actual pilot production and allocation system of the Air Force.

Model Usefulness

The PP/AMM shows the pilot production and allocation system to be a very well-managed resilient system under a wide variety of external influences. It equilibrates when the system is impacted by even large changes in attrition. Further, it behaves very well when impacted by noise. The analysis shows the model's reaction to force build-up, draw-down, and increased attrition. The analysis demonstrates the model's ability to capture the essence of the system changes over a long span of time such as from the end of the Korean War to the present. Analysis of the model demonstrated an example of how it can be used as a management tool to evaluate the effect of policy changes within the actual system. The model will provide information for system managers at a very small cost. Probably the best argument for using this model as an aid to management analysis is the cost, in terms of dollars and time, of applying it. Managers can have results for two or three dollars of computer time and a few hours of work by an analyst. This cost is negligible when compared to the cost of training just one pilot (about five hundred thousand dollars).

Conclusions

The UPT student-to-instructor ratio is a very important factor in accomplishing system goals. The model is very sensitive to changes in this ratio, which suggests its importance in maintaining the systems stability. The rated supplement is effective in filling needs and accepting overflows. Also, the ability of the UPT instructor pilot to accept a four-fold range of student load enhances the stability of the system. This indicates UPT training plans must be kept flexible in the future. Ratios that are extreme should be a flag for management concern.

The importance of the rated supplement is demonstrated in this analysis. The number of pilots in the Air Force is decreasing to a point where the rated supplement is becoming depleted. The Korean War surplus is gone, and pilot attrition is increasing. Yet, a viable supplement is essential to support the mission of the Air Force. The ability to react quickly to increased mission requirements is tied to the rated supplement. The time has come for system managers to carefully examine the policy options available for management of aggregate force levels.

The PP/AMM is useful to managers to evaluate the cost implications of proposed policy changes. It is no surprise that system costs are extremely high. The model demonstrated that any movement out of equilibrium increases system cost. The greatest cost of force reductions could be the reduced ability to perform the mission.

Recommendations

The first recommendation is to apply the PP/AMM to more specific problems of management interest. The author feels it will be useful as an aid in the formation of management policy in areas such as stabilizing the size of the UPT instructor force and desired UPT class size.

The final recommendation is that further research be performed to enhance the capability of the model. The PP/AMM should be modified to allow it to aid in the analysis of the absorbtion problem. In particular, content must be added to account for the force experience mix. The absorbtion problem is a very complex one that is impacted by the forecasted increasing attrition rates. This model, when updated, will be applicable to a study of management policy in this area.

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APPENDIX A

DCRATIO (4) AND (5)

APPENDIX A

DCRATIO (4) and (5)

DCRATIO (4) and (5) are presented in this appendix. The reasoning is the same as for DCRATIO (3) which is explained starting on page 35 of the text.

CRT4 represents bomber and tanker resources. Average crew ratios are 1.5, and there are two pilots per aircraft (1.5 x 2 = 3).

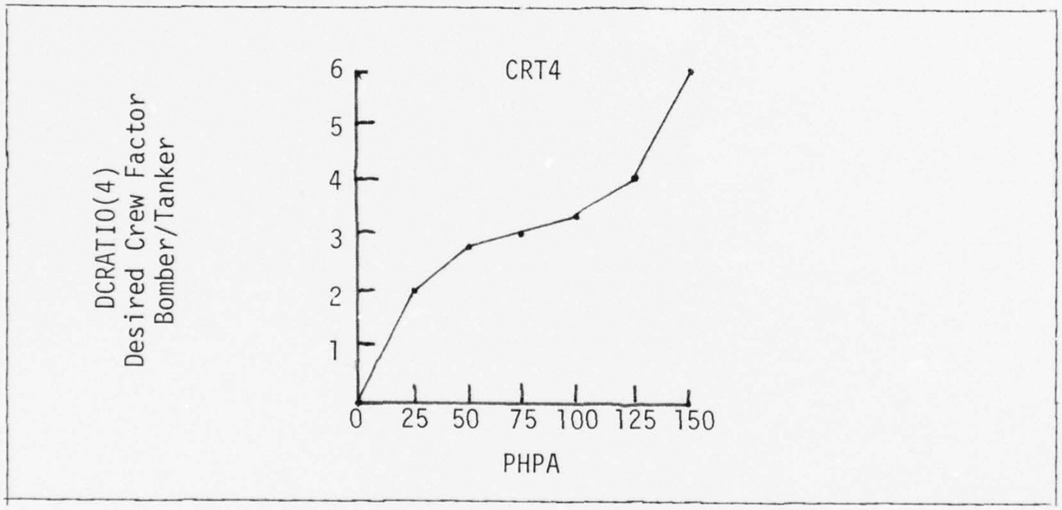

Figure 20. Crew Factor Diagram Bomber/Tanker

A DCRATIO.K(4) = TABHL(CRT4,PHPA.K(4),0,150,25) (67)

where

DCRATIO = desired crew ratio to fly programmed hours
CRT4 = crew table bombers
PHPA = programmed flying hours per aircraft

T CRT4 = 0/2/2.75/3/3.25/4/6 (67.1)

where

CRT4 = crew table bombers

CRT5 represents transport resources. Average crew ratios are 2.0, and the two pilots per aircraft (2.0 x 2.0 = 4.0).

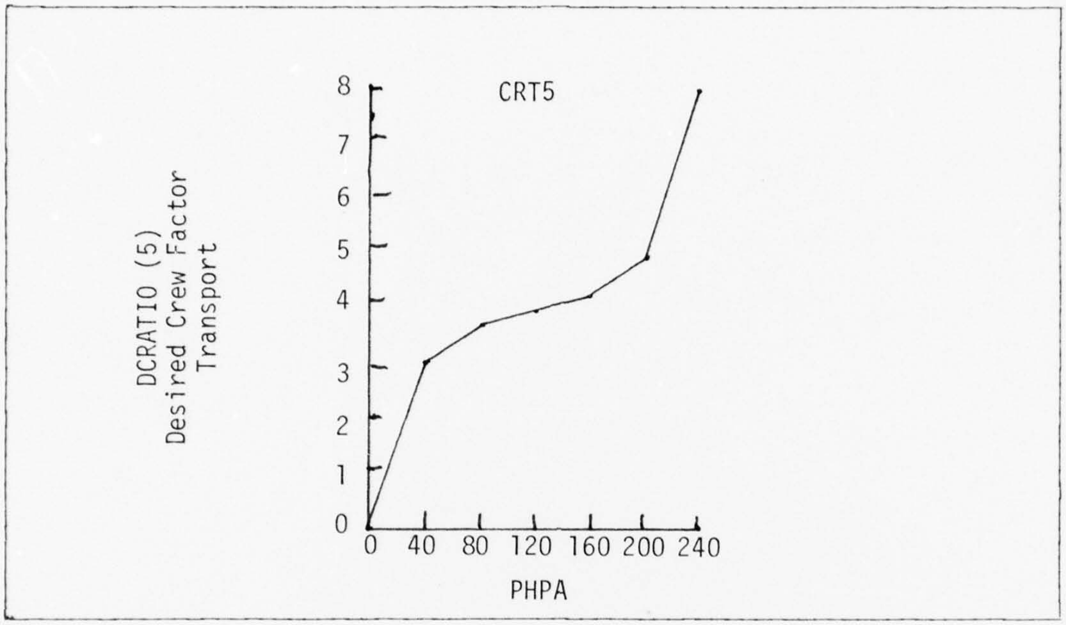

Figure 21. Crew Factor Diagram Transport

A DCRATIO.K(5) = TABHL(CRT5,PHPA.K(5),0,240,40) (68)

where

DCRATIO = desired crew ratio to fly programmed aircraft
CRT5 = crew table transports
PHPA = programmed flying hours

T CRT5 = 0/3/3.75/4/4.25/5/8 (68.1)

where

CRT5 = crew table transports

APPENDIX B

NORMAL EQUILIBRIUM

AND

PROGRAM LISTING

APPENDIX B

<u>Normal Equilibirum and Program Listing</u>

The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

```
                                            6--NORMAL EQUILIBRIUM
PAGE   1  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

 TIME       JOB     TRNG      NEED   DFORCE      ATT     WIND   DTHFOR
              2        2         2        2        2    TPINS   TOTFOR
              3        3         3        3        3      CAP   FOTFOR
              4        4         4        4        4   TONEED    DSIZE
              5        5         5        5        5    FORCE   DDSIZE
           HFPP   DEPOST      PATT   CRATIO   DCRATI      ATJ   AHOURS
              2        2      PRFC        2        2        2        2
              3        3    TRNGFC        3        3        3        3
              4        4     FOEFC        4        4        4        4
              5        5      TDEL        5        5        5        5
          SCOST    PCOST      TPAV
          PCOST    ACOST
          TCOST   TOTCOS
          UCOST    OCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 E-00      E-00     E-00      E-00     E-00     E-00     E-00     E-00
           E-00     E-00      E-00     E-00     E-00     E-00     E-00
           E-00     E-00      E-00     E-00     E-00     E-00     E-00
           E-00     E-00      E-00     E-00     E-00     E-00     E-00
           E-00     E-00      E-00     E-00     E-00     E-12     E-00
           E-00     E-00      E-00     E-00     E-00     E-00     E-00
           E-00     E-12      E-00     E-00     E-00     E-00     E-00
           E-00     E-12      E-03     E-00     E-00     E-00     E 03
           E-00     E-12      E-00     E-00     E-00     E-00     E-00
           E-00     E-12      E-00     E-00     E-00     E-00     E 03
           E 05     E 05      E-00
           E 05     E 03
           E 05     E 05
           E 05     E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 0.00    3425.0   353.93        0.   3425.0   59.500   1540.8   11515.
         540.00   59.540    52.800   640.00   12.300   1.8800   13055.
         4375.0   153.95    452.08   4375.0   87.500   1.0000   15040.
         3000.0   682.00    310.00   3000.0   60.000   1186.9   1203.2
         3600.0   520.93    372.00   3600.0   72.000     0.00   1203.2
             0.   0.0000    1203.2       0.       0.   12.000       0.
             0.    0.000    300.60       0.       0.   16.000       0.
         48.000  -59.205    211.12   1.2500   1.2500   12.000   210.00
         25.000  -14.557    1.0000   3.0100   3.0000   12.000   75000.
         30.000  -14.557    7.0000   4.0000   4.0000   12.000   133.00
             0.     0.00    1.0000
           0.00       0.
             0.       0.
            0.0       0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

PAGE 2 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

4.00	3425.0	353.37	0.	3425.0	53.500	1540.8	11515.
	640.00	58.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	373.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	682.00	310.00	3000.0	50.000	1135.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	582.08	1203.2
	0.	.3492	1203.2	0.	0.	12.000	0.
	0.	37.311	300.60	0.	0.	16.000	0.
	48.000	29.10	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	458.	15.5	1.0000				
	12.33	3018.					
	1325.	2006.					
	282.9	1998.					

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8.00	3425.0	353.37	0.	3425.0	53.500	1540.8	11515.
	640.00	68.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	682.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.30	372.00	3600.0	72.000	814.91	1203.2
	0.	.7357	1203.2	0.	0.	12.000	0.
	0.	18.137	300.60	0.	0.	16.000	0.
	48.000	29.10	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	915.	71.23	1.0000				
	24.55	5015.					
	2550.	4133.					
	553.5	3805.					

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12.00	3425.0	353.37	0.	3425.0	53.500	1540.8	11515.
	640.00	58.540	52.800	640.00	12.900	1.8800	13055.
	4375.0	858.93	452.08	4375.0	87.500	1.0000	15040.
	3000.0	682.00	310.00	3000.0	50.000	1185.9	1203.2
	3600.0	520.30	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0915	1203.2	0.	0.	12.000	0.
	0.	-7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	1373.	46.92	1.0000				
	35.98	9024.					
	3975.	6293.					
	848.3	5442.					

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PAGE    3  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

  16.00   3425.0   353.32        0.   3425.0   58.500    1540.8   11515.
          640.00   68.540   52.800   640.00   12.800    1.8800   13055.
          4375.0   958.35   452.08   4375.0   37.500    1.0000   15040.
          3000.0   582.00   310.00   3000.0   60.000    1186.9   1203.2
          3600.0   520.30   372.00   3600.0   72.000    814.91   1203.2
              0.   1.0914   1203.2       0.       0.    12.000       0.
              0.   21.328   300.60       0.       0.    16.000       0.
          48.000   29.104   211.12   1.2500   1.2500    12.000   210.00
          25.000   14.552   1.0000   3.0000   3.0000    12.000   75000.
          30.000   14.552   7.0000   4.0000   4.0000    12.000   103.00
           1830.    62.57   1.0000
           49.31   12032.
           5300.    8335.
          1131.0    5922.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  20.00   3425.0   353.32        0.   3425.0   58.500    1540.8   11515.
          640.00   68.540   52.800   640.00   12.800    1.8800   13055.
          4375.0   958.35   452.08   4375.0   37.500    1.0000   15040.
          3000.0   582.00   310.00   3000.0   60.000    1186.9   1203.2
          3600.0   520.30   372.00   3600.0   72.000    931.32   1203.2
              0.   1.0914   1203.2       0.       0.    12.000       0.
              0.    7.275   300.60       0.       0.    16.000       0.
          48.000   29.104   211.12   1.2500   1.2500    12.000   210.00
          25.000   14.552   1.0000   3.0000   3.0000    12.000   75000.
          30.000   14.552   7.0000   4.0000   4.0000    12.000   103.00
           2283.    79.21   1.0000
           61.53   15040.
           6625.   10432.
          1413.8    8262.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  24.00   3425.0   353.32        0.   3425.0   58.500    1540.8   11515.
          640.00   68.540   52.800   640.00   12.800    1.8800   13055.
          4375.0   958.35   452.08   4375.0   37.500    1.0000   15040.
          3000.0   582.00   310.00   3000.0   60.000    1186.9   1203.2
          3600.0   520.30   372.00   3600.0   72.000    814.91   1203.2
              0.   1.0914   1203.2       0.       0.    12.000       0.
              0.   35.390   300.60       0.       0.    16.000       0.
          48.000   29.104   211.12   1.2500   1.2500    12.000   210.00
          25.000   14.552   1.0000   3.0000   3.0000    12.000   75000.
          30.000   14.552   7.0000   4.0000   4.0000    12.000   103.00
           2745.    93.95   1.0000
           73.96   18048.
           7951.   12578.
          1596.5    9473.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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PAGE 4 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

28.00	3425.0	353.32	0.	3425.0	58.300	1540.8	11515.
	640.00	58.540	52.800	640.00	12.300	1.5600	13055.
	4375.0	858.35	452.08	-375.0	87.500	1.0000	150+0.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0913	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	3203.	109.43	1.0000				
	85.28	21056.					
	9276.	14675.					
	1979.3	10570.					

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32.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11515.
	640.00	58.540	52.800	640.00	12.300	1.9800	13055.
	4375.0	858.35	452.08	-375.0	87.500	1.0000	150+0.
	3000.0	532.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.30	372.00	3600.0	72.000	931.32	1203.2
	0.	1.0913	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	3661.	125.17	1.0000				
	98.51	24064.					
	10601.	15771.					
	2262.0	11562.					

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36.00	3425.0	353.92	0.	3425.0	58.500	1540.8	11615.
	640.00	58.541	52.300	640.00	12.300	1.8300	13055.
	4375.0	378.35	452.08	4375.0	37.500	1.0000	150+0.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.30	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	36.392	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	4113.	149.77	1.0000				
	110.34	27072.					
	11925.	18857.					
	2544.8	12460.					

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40.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11615.
	640.00	68.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	60.000	1186.9	1203.2
	3600.0	520.83	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	4573.	156.42	1.0000				
	123.26	30030.					
	13251.	20964.					
	2827.5	13272.					

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44.00	3425.0	353.32	0.	3425.0	55.500	1540.8	11615.
	640.00	68.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	60.000	1166.9	1203.2
	3600.0	520.83	372.00	3600.0	72.000	931.32	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	5033.	172.05	1.0000				
	135.59	33039.					
	14575.	23060.					
	3110.3	14007.					

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48.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11615.
	640.00	68.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	60.000	1186.9	1203.2
	3600.0	520.83	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	36.393	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	5491.	187.70	1.0000				
	147.32	36036.					
	15901.	25157.					
	5333.0	14673.					

- -

52.00	3425.0	353.37	0.	3425.0	53.500	1540.8	11515.
	540.00	58.540	52.800	540.00	12.300	1.5800	13055.
	4375.0	853.33	452.08	4375.0	57.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1136.9	1203.2
	3600.0	520.37	372.00	3600.0	72.000	814.91	1203.2
	0.	1.331	1203.2	0.	0.	12.000	0.
	0.	7.277	300.80	0.	0.	16.000	0.
	48.000	29.103	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.352	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.352	7.0000	4.0000	-.0000	12.000	108.00
	5948.	203.7-	1.0000				
	160.24	39114.					
	17225.	27273.					
	3675.9	15274.					

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56.00	3425.0	353.37	0.	3425.0	58.500	1540.8	11515.
	540.00	58.540	52.800	540.00	12.300	1.8800	13055.
	4375.0	853.37	452.08	4375.0	57.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.100	1186.9	1203.2
	3600.0	520.30	372.00	3500.0	72.000	931.32	1203.2
	0.	1.0911	1203.2	0.	0.	12.000	0.
	0.	7.273	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.352	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.352	7.0000	4.0000	4.0000	12.000	108.00
	6405.	213.99	1.0000				
	172.57	42112.					
	18551.	29343.					
	3958.5	15819.					

- -

60.00	3425.0	353.37	0.	3425.0	58.500	1540.8	11515.
	540.00	58.540	52.800	540.00	12.300	1.8800	13055.
	4375.0	853.37	452.08	4375.0	57.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.30	372.00	3500.0	72.000	814.91	1203.2
	0.	1.0911	1203.2	0.	0.	12.000	0.
	0.	35.371	300.80	0.	0.	16.000	0.
	48.000	23.113	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.352	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.372	7.0000	4.0000	4.0000	12.000	108.00
	6963.	234.37	1.0000				
	134.30	45120.					
	19875.	31445.					
	4241.3	16312.					

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PAGE 7 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

64.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11515.
	640.00	59.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	358.39	452.08	4375.0	37.500	1.0000	15040.
	3000.0	682.00	310.00	3000.0	50.000	1136.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	7321.	250.27	1.0000				
	197.22	48125.					
	21201.	33542.					
	4524.0	15737.					

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68.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11515.
	640.00	59.641	52.800	640.00	12.300	1.8800	13055.
	4375.0	358.39	452.08	4375.0	37.500	1.0000	15040.
	3000.0	682.00	310.00	3000.0	50.000	1136.9	1203.2
	3600.0	520.90	372.00	3600.0	72.000	931.32	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	7773.	255.91	1.0000				
	209.55	51136.					
	22525.	35633.					
	4806.8	17151.					

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72.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11515.
	640.00	58.540	52.800	640.00	12.300	1.8800	13055.
	4375.0	358.39	452.08	4375.0	37.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0911	1203.2	0.	0.	12.000	0.
	0.	36.390	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	8235.	281.57	1.0000				
	221.88	54144.					
	23852.	37735.					
	5089.5	17525.					

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75.00	3425.0	353.32	0.	3425.0	53.500	1540.8	11615.
	640.00	58.541	52.800	640.00	12.300	1.8800	13065.
	4375.0	158.39	452.08	4375.0	37.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1196.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	8694.	297.17	1.0000				
	234.20	57152.					
	25177.	39831.					
	5372.3	17855.					

80.00	3425.0	353.32	0.	3425.0	53.500	1540.8	11615.
	640.00	58.541	52.800	640.00	12.300	1.8800	13065.
	4375.0	158.39	452.08	4375.0	37.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	931.32	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	7.275	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	9151.	312.83	1.0000				
	246.53	50157.					
	26502.	41923.					
	5655.0	18135.					

84.00	3425.0	353.32	0.	3425.0	53.500	1540.8	11615.
	640.00	58.540	52.800	640.00	12.300	1.8800	13065.
	4375.0	158.39	452.08	4375.0	37.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.30	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0914	1203.2	0.	0.	12.000	0.
	0.	35.380	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	9603.	328.47	1.0000				
	258.35	53158.					
	27827.	44024.					
	5937.8	18425.					

PAGE 9 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

88.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11515.
	640.00	58.541	52.800	640.00	12.300	1.6800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.0915	1203.2	0.	0.	12.000	0.
	0.	7.275	300.60	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	10065.	344.12	1.0000				
	271.18	56176.					
	29152.	45120.					
	6220.5	18570.					

- -

92.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11615.
	640.00	68.545	52.800	640.00	12.300	1.8800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	931.32	1203.2
	0.	1.091-	1203.2	0.	0.	12.000	0.
	0.	7.275	300.60	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	10524.	359.73	1.0000				
	283.51	59184.					
	30477.	48217.					
	6503.3	18331.					

- -

95.00	3425.0	353.32	0.	3425.0	58.500	1540.8	11515.
	640.00	58.541	52.800	640.00	12.300	1.8800	13055.
	4375.0	858.35	452.08	4375.0	87.500	1.0000	15040.
	3000.0	582.00	310.00	3000.0	50.000	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.091-	1203.2	0.	0.	12.000	0.
	0.	36.381	300.60	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.2500	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	108.00
	10982.	375.40	1.0000				
	295.83	72192.					
	31802.	50313.					
	6786.0	19032.					

- -

PAGE 10 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

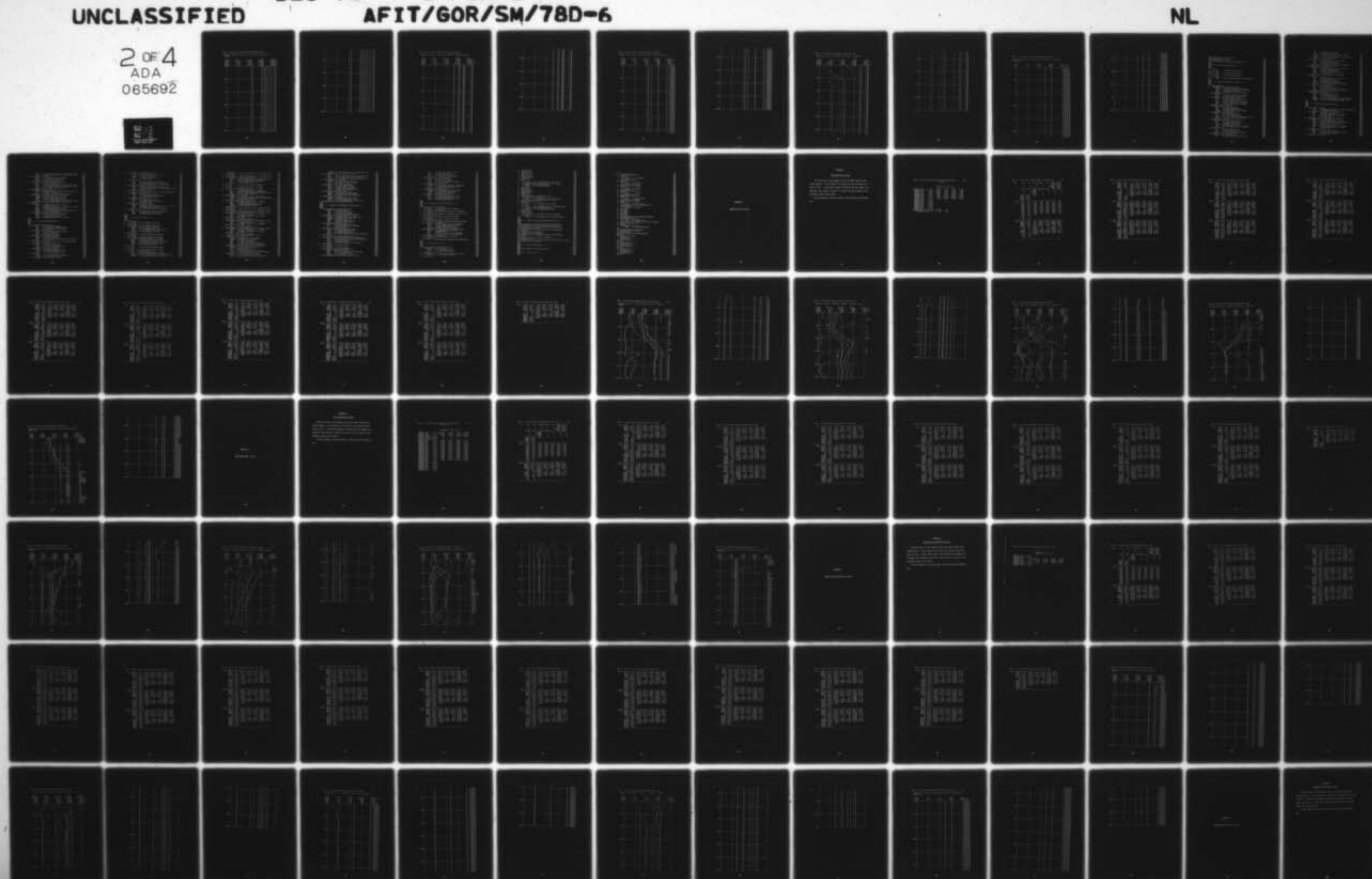
100.00	3425.0	353.00	0.	3425.0	68.500	1540.8	11515.
	640.00	53.540	52.800	640.00	12.300	1.8300	13055.
	4375.0	378.95	452.08	4375.0	37.500	1.0000	15040.
	3000.0	682.00	310.00	3000.0	60.000	1195.9	1203.2
	3600.0	520.80	372.00	3600.0	72.000	814.91	1203.2
	0.	1.1114	1203.2	0.	0.	12.000	0.
	0.	7.273	300.80	0.	0.	16.000	0.
	48.000	29.104	211.12	1.2500	1.7510	12.000	210.00
	25.000	14.552	1.0000	3.0000	3.0000	12.000	75000.
	30.000	14.552	7.0000	4.0000	4.0000	12.000	103.00
	11439.	391.0	1.0000				
	308.16	75200.					
	33127.	52410.					
	7066.8	19273.					

- -

AD-A065 692 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH--ETC F/G 5/1
SYSTEMS DYNAMICS MODELING APPROACH TO ANALYSIS OF THE USAF PILO--ETC(U)
DEC 78 P L FEKKE

UNCLASSIFIED AFIT/GOR/SM/78D-6 NL

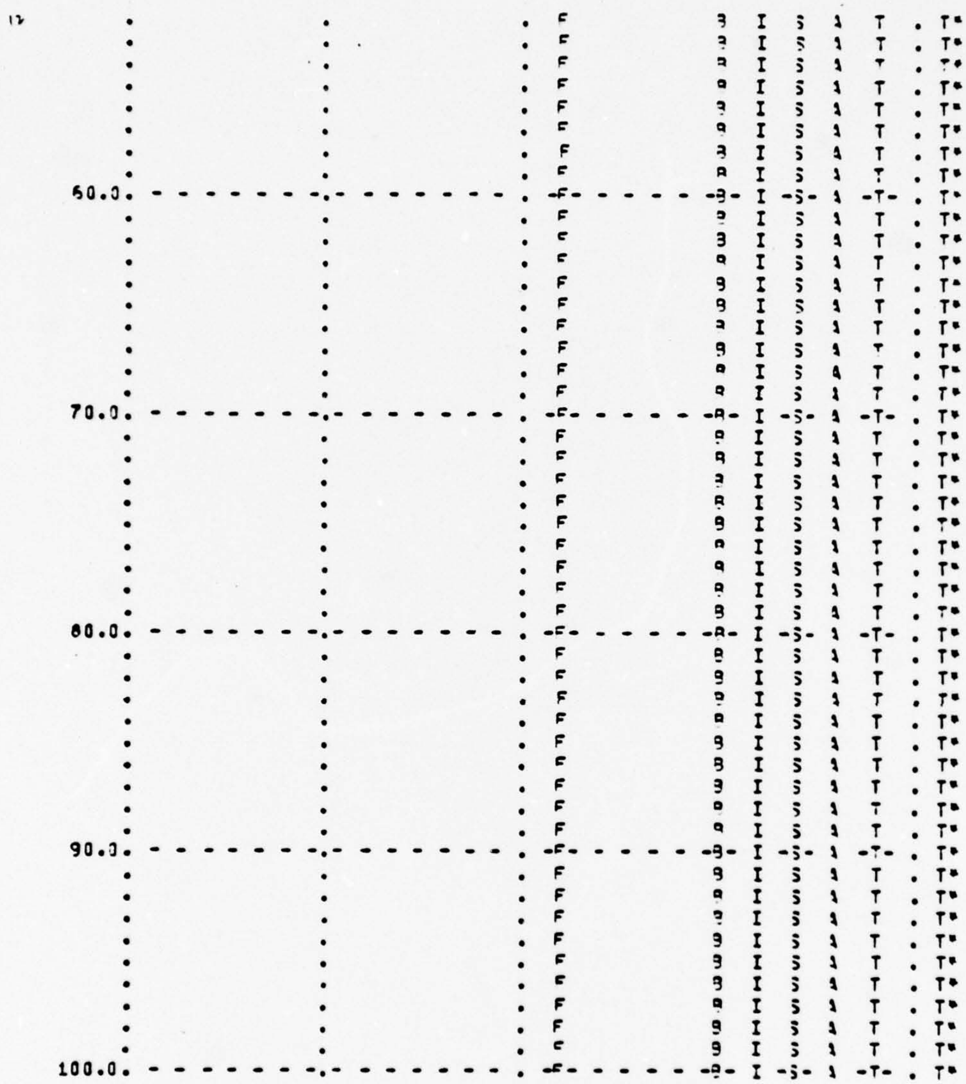
2 OF 4
ADA
065692



PAGE 11 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

```
 JOB(1)=S   JOB(2)=I   JOB(3)=F   JOB(4)=B   JOB(5)=A   TOTFOR=T
 FORSIZ=*

  0.000T           1.000T           2.000T           3.000T           4.000T S
  0.000          200.000          400.000          600.000          800.000  I
  0.000T           2.000T           4.000T           6.000T           8.000T F
  0.000T           1.000T           2.000T           3.000T           4.000T BA
  0.000T           5.000T          10.000T          15.000T          20.000T T*
   0.0. - - - - - - - -.- - - - - - - - . -F- - - - - - -B- I -S- A -T- . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
  10.0. - - - - - - - -.- - - - - - - - . -F- - - - - - -B- I -S- A -T- . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
  20.0. - - - - - - - -.- - - - - - - - . -F- - - - - - -B- I -S- A -T- . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
  30.0. - - - - - - - -.- - - - - - - - . -F- - - - - - -B- I -S- A -T- . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
  40.0. - - - - - - - -.- - - - - - - - . -F- - - - - - -B- I -S- A -T- . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
      .                .                . F             B  I  S  A  T  . T*
  50.0. - - - - - - - -.- - - - - - - - . -F- - - - - - -B- I -S- A -T- . T*
      .                .                . F             B  I  S  A  T  . T*
```


60.0
70.0
80.0
90.0
100.0

```
PAGE  12  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

  TRNG(1)=1  TRNG(2)=2  TRNG(3)=3  TRNG(4)=4  TRNG(5)=5  WIND=W

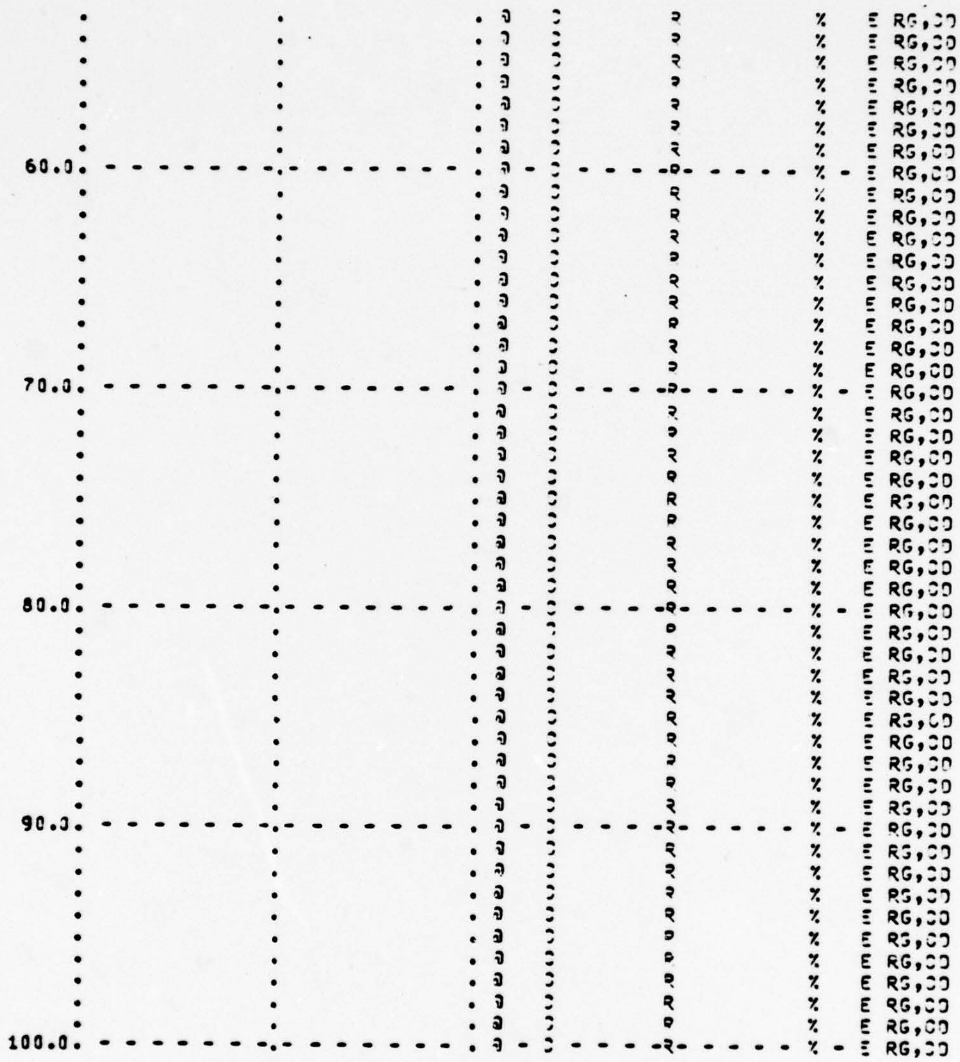
    0.000          100.000          200.000          300.000          400.000  1
    0.000           20.000           40.000           60.000           80.000  2
    0.000T            .250T            .500T            .750T           1.000T 3
    0.000          200.000          400.000          600.000          800.000  45
    0.000T            .500T           1.000T           1.500T           2.000T W
    0.0. - - - - - - - -.- - - - - - - - - . - - - - -5- - - -.W - -231- - - - . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
   10.0. - - - - - - - -.- - - - - - - - - . - - - - -5- - - -.W - -231- - - - . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
   20.0. - - - - - - - -.- - - - - - - - - . - - - - -5- - - -.W - -231- - - - . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
   30.0. - - - - - - - -.- - - - - - - - - . - - - - -5- - - -.W - -231- - - - . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
   40.0. - - - - - - - -.- - - - - - - - - . - - - - -5- - - -.W - -231- - - - . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
   50.0. - - - - - - - -.- - - - - - - - - . - - - - -5- - - -.W - -231- - - - . 24
       .               .                 .          5       .W     231        . 24
       .               .                 .          5       .W     231        . 24
```

```
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
  60.0.- - - - - - - - -.- - - - - - - - -.- - - - -5- - - -.W - -231- - - -  .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
  70.0.- - - - - - - - -.- - - - - - - - -.- - - - -5- - - -.W - -231- - - -  .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
  80.0.- - - - - - - - -.- - - - - - - - -.- - - - -5- - - -.W - -231- - - -  .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
  90.0.- - - - - - - - -.- - - - - - - - -.- - - - -5- - - -.W - -231- - - -  .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
       .                 .                 .          5       .W     231        .  24
 100.0.- - - - - - - - -.- - - - - - - - -.- - - - -5- - - -.W - -231- - - -  .  24
```

PAGE 13 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

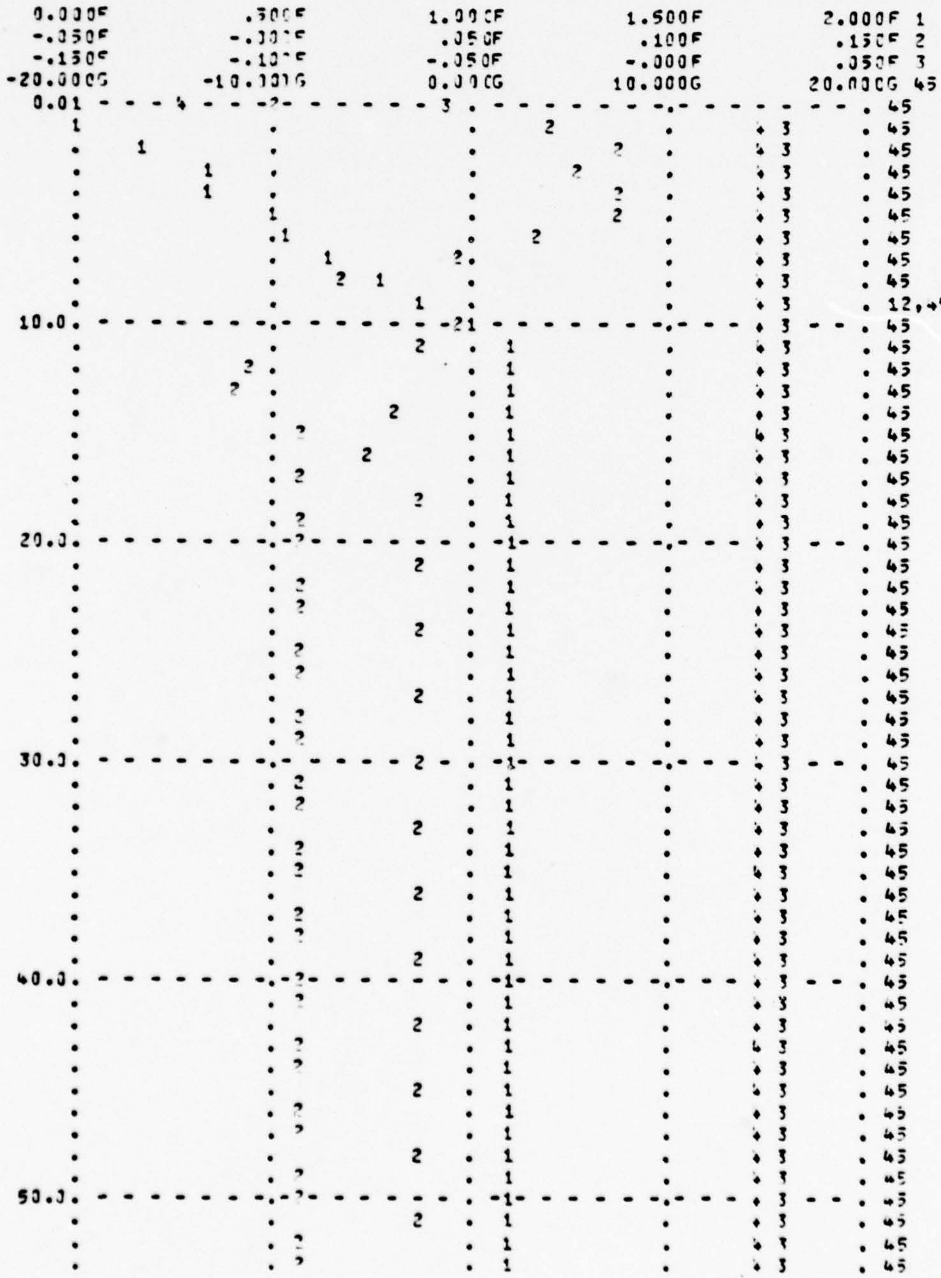
PRED=R UPT=G DSIZE=C DCSIZE=D TRINS=% EOEFC=E TRNGFD=@

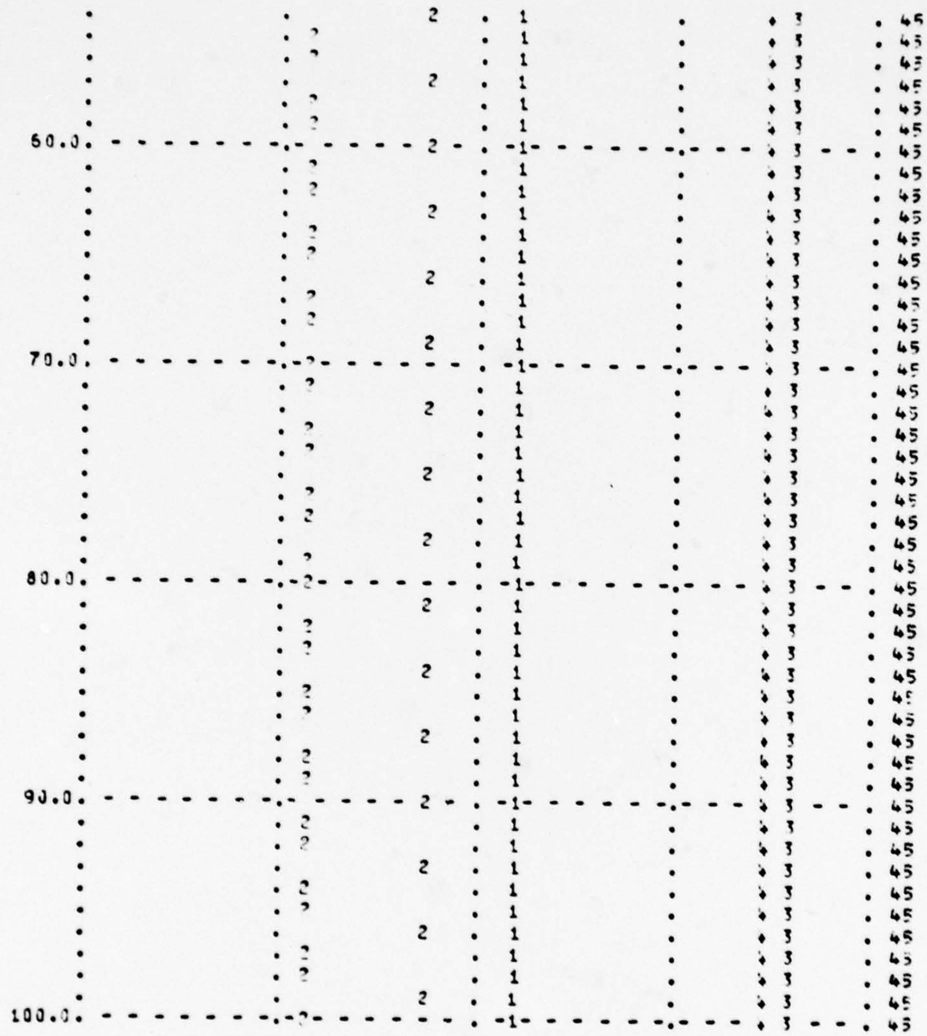
```
 0.000        100.000         200.000          300.000         400.000  RG
 0.000T          .500T          1.000T           1.500T          2.000T CD
 0.000           .500           1.000            1.500           2.000  %
 0.000           .250            .500             .750           1.000  E
 0.000           .100            .200             .300            .400  @
  0.0. - - - - - - -.- - - - - - - . @ - C - - - - -R- - - - - % - E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
 10.0. - - - - - - -.- - - - - - - . @ - C - - - - -R- - - - - % - E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
 20.0. - - - - - - -.- - - - - - - . @ - C - - - - -R- - - - - % - E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
 30.0. - - - - - - -.- - - - - - - . @ - C - - - - -R- - - - - % - E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
 40.0. - - - - - - -.- - - - - - - . @ - C - - - - -R- - - - - % - E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
 50.0. - - - - - - -.- - - - - - - . @ - C - - - - -R- - - - - % - E RG,CD
     .              .              . @   C           R           %   E RG,CD
     .              .              . @   C           R           %   E RG,CD
```


60.0
70.0
80.0
90.0
100.0

PAGE 14 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

OFDSC(1)=1 OFDSC(2)=2 OFDSC(3)=3 OFDSC(4)=4 OFDSC(5)=5




60.0
70.0
80.0
90.0
100.0

PAGE 15 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

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  CRATIO(3)=1  DCRATI(3)=2  CRATIO(4)=3  DCRATI(4)=4  CRATIO(5)=5
  DCRATI(5)=6

   0.000              .500               1.000               1.500              2.000  12
   0.000             1.000               2.000               3.000              4.000  3456
   0.0. - - - - - - - -.- - - - - - - - - . - - -21 - - -3- - - - - - - - - 5 34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
  10.0. - - - - - - - -.- - - - - - - - - . - - -1- - - -3- - - - - - - - - 5 12,34,56
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      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
  20.0. - - - - - - - -.- - - - - - - - - . - - -1- - - -3- - - - - - - - - 5 12,34,56
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      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
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      .                 .                   .        1        3                  5 12,34,56
  30.0. - - - - - - - -.- - - - - - - - - . - - -1- - - -3- - - - - - - - - 5 12,34,56
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      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
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      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
  40.0. - - - - - - - -.- - - - - - - - - . - - -1- - - -3- - - - - - - - - 5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
  50.0. - - - - - - - -.- - - - - - - - - . - - -1- - - -3- - - - - - - - - 5 12,34,56
      .                 .                   .        1        3                  5 12,34,56
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      .                 .                   .        1        3                  5 12,34,56
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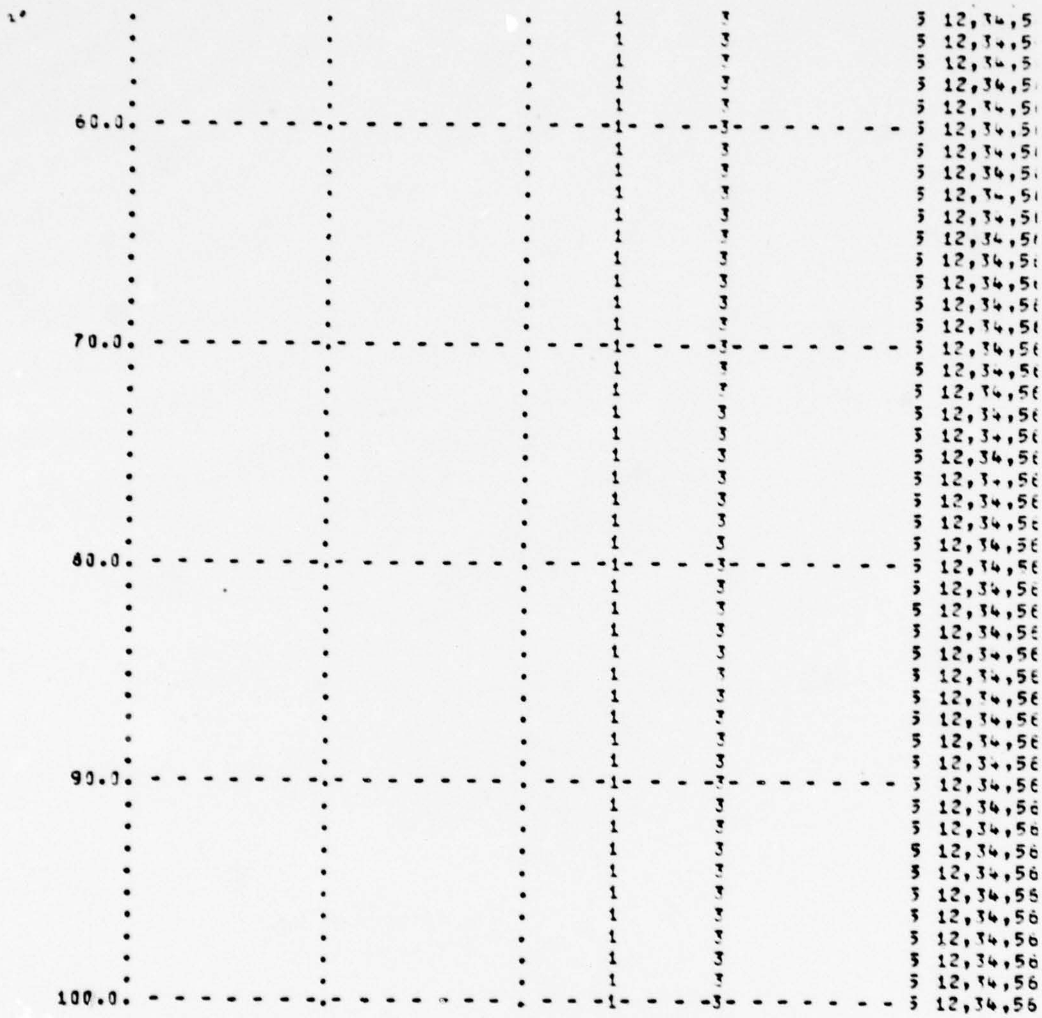
60.0
70.0
80.0
90.0
100.0

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PLF,CM77777,T/0.T18376 ,FEKKE,4014
ATTACH,DYNAMO,DYNJCL,ID=AFIT.
BEGIN,DYNAMO,DYNAMO,CM=77777.
*     PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL
NOTE
NOTE
NOTE * * * * ARRAY INITIALIZATION * * * *
NOTE
NOTE
C    TCAT=5
            TCAT      - CATEGORIES OF PILOT JOBS
FOR CAT=1,TCAT
            CAT       - CATEGORY ITERATION INDEX
FOR PIL=2,TCAT
            PIL       - INDEX FOR FLYING JOBS
FOR MPIL=3,TCAT
            MPIL      - INDEX FOR NON-INSTRUCTOR FLYING JOBS
NOTE
NOTE
NOTE * * * * FORCE STRUCTURE BY PILOT TYPE * * * *
NOTE
NOTE
L    WIND.K=WIND.J+DT*
X      (SUM(TOWIND.JK)+UPT.JK-SUM(TOTRNG.JK))
            WIND      - PILOTS IN REALLOCATION PROCESS
            TOWIND    - ASSIGNMENT RATE FROM PILOT CATEGORY
            UPT       - MISSION PILOT GRADUATES
            TOTRNG    - ASSIGNMENT RATE TO W/S TRAINING
N    WIND=SUM(IWIND)
            WIND      - PILOTS IN REALLOCATION PROCESS
            IWIND     - PILOTS IN JOB FOR REASSIGNMENT
N    IWIND(CAT)=ATT(CAT)+JOBI(CAT)/ATJC(CAT)
            IWIND     - PILOTS IN JOB FOR REASSIGNMENT
            CAT       - CATEGORY ITERATION INDEX
            ATT       - PILOT ATTRITION RATE BY CATEGORY
            JOBI      - INITIAL FORCE SIZE BY CATEGORY
            ATJC      - AVERAGE TIME IN JOB BY CATEGORY
L    TRNG.K(CAT)=TRNG.J(CAT)+DT*
X      (TOTRNG.JK(CAT)-TOJOB.JK(CAT))
            TRNG      - PILOTS IN W/S TRAINING
            CAT       - CATEGORY ITERATION INDEX
            TOTRNG    - ASSIGNMENT RATE TO W/S TRAINING
            TOJOB     - ASSIGNMENT RATE TO JOB
N    TRNG(CAT)=ATUPGD(CAT)*IWIND(CAT)
            TRNG      - PILOTS IN W/S TRAINING
            CAT       - CATEGORY ITERATION INDEX
            ATUPGD    - AVG TIME IN UPGRADE/REASSIGNMENT PIPELINE
            IWIND     - PILOTS IN JOB FOR REASSIGNMENT
L    JOB.K(CAT)=JOB.J(CAT)+DT*
X      (TOJOB.JK(CAT)-TOWIND.JK(CAT)-ATT.JK(CAT))
            JOB       - PILOTS IN EACH CATEGORY
            CAT       - CATEGORY ITERATION INDEX
            TOJOB     - ASSIGNMENT RATE TO JOB
            TOWIND    - ASSIGNMENT RATE FROM PILOT CATEGORY
            ATT       - PILOT ATTRITION RATE BY CATEGORY
N    JOB(CAT)=JOBI(CAT)
            JOB       - PILOTS IN EACH CATEGORY
            CAT       - CATEGORY ITERATION INDEX
            JOBI      - INITIAL FORCE SIZE BY CATEGORY
R    ATT.KL(CAT)=JOB.K(CAT)*ATTRATE(CAT)
X      *(ATTADJ.K(CAT)/ATADJTM(CAT))*TEST4.K(CAT)
            ATT       - PILOT ATTRITION RATE BY CATEGORY
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            CAT      - CATEGORY ITERATION INDEX
            JOB      - PILOTS IN EACH CATEGORY
            ATTRATE  - PROGRAMMED ATTRITION RATE BY CATEGORY
            ATTADJ   - ATTRITION ADJUSTMENT FACTOR
            ATADJTM  - ATTRITION RATE ADJUSTMNET TIME BY CATEGORY
            TEST4    - TEST ON ATTRITION RATE
N     ATT(CAT)=JOB(CAT)*ATTRATE(CAT)
            ATT      - PILOT ATTRITION RATE BY CATEGORY
            CAT      - CATEGORY ITERATION INDEX
            JOB      - PILOTS IN EACH CATEGORY
            ATTRATE  - PROGRAMMED ATTRITION RATE BY CATEGORY
R     TOWIND.KL(CAT)=(JOB.K(CAT)*JOB.K(CAT))/
X       (DFORCE.K(CAT)*ATJ.K(CAT))
            TOWIND   - ASSIGNMENT RATE FROM PILOT CATEGORY
            CAT      - CATEGORY ITERATION INDEX
            JOB      - PILOTS IN EACH CATEGORY
            DFORCE   - DESIRED FORCE SIZE BY MISSION
            ATJ      - AVG TIME IN JOB
A     ATJ.K(1)=ATJC(1)*(SUMV(JOB.K,2,TCAT)/DTMFOR.K)
X       *TEST11.K(1)
            ATJ      - AVG TIME IN JOB
            ATJC     - AVERAGE TIME IN JOB BY CATEGORY
            JOB      - PILOTS IN EACH CATEGORY
            TCAT     - CATEGORIES OF PILOT JOBS
            DTMFOR   - DESIRED TOTAL MISSION FORCE
            TEST11   - TEST ON AVG TIME IN FLYING CATEGORY
A     ATJ.K(PIL)=ATJC(PIL)*TEST11.K(PIL)
            ATJ      - AVG TIME IN JOB
            PIL      - INDEX FOR FLYING JOBS
            ATJC     - AVERAGE TIME IN JOB BY CATEGORY
            TEST11   - TEST ON AVG TIME IN FLYING CATEGORY
R     TOJOB.KL(CAT)=TRNG.K(CAT)*TEST12.K(CAT)/
X       (ATUPGD(CAT)+ATJTIME(CAT))
            TOJOB    - ASSIGNMENT RATE TO JOB
            CAT      - CATEGORY ITERATION INDEX
            TRNG     - PILOTS IN W/S TRAINING
            TEST12   - TEST ON ASSIGNMENT RATE TO PILOT CATEGORY
            ATUPGD   - AVG TIME IN UPGRADE/REASSIGNMENT PIPELINE
            ATJTIME  - AVG TIME TO ADJUST PILOT FORCE
NOTE
NOTE
NOTE * * * * ASSIGNMENT/REASSIGNMENT CONTROL * * * *
NOTE
NOTE
A     NEED.K(1)=MAX(0,SUPN.K)
            NEED     - PERSONNEL REQUIREMENT IN THE RATED SUPPLEMENT
            SUPN     - CRITICAL RATED SUPPLEMENT
A     NEED.K(2)=MAX((INP.K+SMOOTH(ATT.JK(2),AST)),0)
            NEED     - INSTRUCTOR REQUIREMENTS
            INP      - PROJECTED INSTRUCTOR PILOT NEEDS
            ATT      - PILOT ATTRITION RATE BY CATEGORY
            ST       - SMOOTHING TIMES
A     NEED.K(MPIL)=MAX((DFORCE.K(MPIL)-JOB.K(MPIL)
X       +TOWIND.JK(MPIL)+SMOOTH(ATT.JK(MPIL),AST)),0)
            NEED     - PILOT REQUIREMENTS BY CATEGORY
            MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
            DFORCE   - DESIRED FORCE SIZE BY MISSION
            JOB      - PILOTS IN EACH CATEGORY
            TOWIND   - ASSIGNMENT RATE FROM PILOT CATEGORY
            ATT      - PILOT ATTRITION RATE BY CATEGORY
            ST       - SMOOTHING TIMES
A     SUPN.K=SSS-JOB.K(1)
            SUPN     - CRITICAL RATED SUPPLEMENT
            SSS      - VISIBILITY LEVEL FOR RATED SUPPLEMENT
            JOB      - PILOTS IN EACH CATEGORY
A     TONEED.K=MAX(1,SUM(NEED.K))
```

```
         TONEED  - TOTAL REQUIRED PERSONNEL FOR ASSIGNMENT FILLS
         NEED    - PERSONNEL REQUIREMENT IN THE RATED SUPPLEMENT
A   INVSUP.K=WIND.K-PINVDIS.K
         INVSUP  - PILOTS AVAILABLE FOR RATED SUP
         WIND    - PILOTS IN REALLOCATION PROCESS
         PINVDIS - ASSIGNMENTS TO FLYING JOBS
A   INDISC.K(CAT)=(NEED.K(CAT)/TONEED.K)*WIND.K
         INDISC  - PROJECTED ASSIGNMENTS TO JOBS
         CAT     - CATEGORY ITERATION INDEX
         NEED    - PERSONNEL REQUIREMENT IN THE RATED SUPPLEMENT
         TONEED  - TOTAL REQUIRED PERSONNEL FOR ASSIGNMENT FILLS
         WIND    - PILOTS IN REALLOCATION PROCESS
A   PINVDIS.K=SUMV(NEED.K,2,TCAT)
         PINVDIS - ASSIGNMENTS TO FLYING JOBS
         NEED    - PERSONNEL REQUIREMENT IN THE RATED SUPPLEMENT
         TCAT    - CATEGORIES OF PILOT JOBS
R   TOTRNG.KL(1)=CLIP(INVSUP.K,INDISC.K(1),WIND.K,TONEED.K)
         TOTRNG  - ASSIGNMENT RATE TO W/S TRAINING
         INVSUP  - PILOTS AVAILABLE FOR RATED SUP
         INDISC  - PROJECTED ASSIGNMENTS TO JOBS
         WIND    - PILOTS IN REALLOCATION PROCESS
         TONEED  - TOTAL REQUIRED PERSONNEL FOR ASSIGNMENT FILLS
R   TOTRNG.KL(PIL)=CLIP(NEED.K(PIL),INDISC.K(PIL),WIND.K,
X     TONEED.K)
         TOTRNG  - ASSIGNMENT RATE TO W/S TRAINING
         PIL     - INDEX FOR FLYING JOBS
         NEED    - PERSONNEL REQUIREMENT IN THE RATED SUPPLEMENT
         INDISC  - PROJECTED ASSIGNMENTS TO JOBS
         WIND    - PILOTS IN REALLOCATION PROCESS
         TONEED  - TOTAL REQUIRED PERSONNEL FOR ASSIGNMENT FILLS
A   INP.K=DFORCE.K(2)-JOB.K(2)+TOWIND.JK(2)
         INP     - PROJECTED INSTRUCTOR PILOT NEEDS
         DFORCE  - DESIRED FORCE SIZE BY MISSION
         JOB     - PILOTS IN EACH CATEGORY
         TOWIND  - ASSIGNMENT RATE FROM PILOT CATEGORY
NOTE
NOTE
NOTE * * * * PILOT PRODUCTION PIPELINE * * * *
NOTE
NOTE
R   UPT.KL=DELAY3(PREC.JK,TDEL.K)
         UPT     - MISSION PILOT GRADUATES
         PREC    - PILOT CANDIDATE RECRUITING RATE
         TDEL    - AVG TIME THROUGH UPT PIPELINE
R   PREC.KL=(CSIZE.K/4)*MREC.K
         PREC    - PILOT CANDIDATE RECRUITING RATE
         CSIZE   - ANNUAL UPT CLASS SIZE
         MREC    - RECRUITING CAPACITY
A   MREC.K=TABLE(TREC,CSIZE.K/4,0,1400,200)
         MREC    - RECRUITING CAPACITY
         CSIZE   - ANNUAL UPT CLASS SIZE
         TREC    - CLASS SIZE ADJUST FACTOR FOR UPT RECRUITING
T   TREC=1/1/1/1/1/.95/.89/.82
         TREC    - CLASS SIZE ADJUST FACTOR FOR UPT RECRUITING
A   CSIZE.K=JOB.K(2)*TPINS.K
         CSIZE   - ANNUAL UPT CLASS SIZE
         JOB     - PILOTS IN EACH CATEGORY
         TPINS   - UPT STUDENT/INSTRUCTOR RATIO
A   TPINS.K=TABHL(TTPIR,TT.K,0,1.75,.25)
         TPINS   - UPT STUDENT/INSTRUCTOR RATIO
         TTPIR   - STUDENT INSTRUCTOR RATIO
         TT      - CLASS SIZE ADJUSTMENT FACTOR
N   TPINS=TPINSI
         TPINS   - UPT STUDENT/INSTRUCTOR RATIO
         TPINSI  - DESIRED STUDENT/INSTRUCTOR RATIO
T   TTPIR=0/.47/.94/1.41/1.88/2.35/3.15/4.0
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         TIMIR    - STUDENT INSTRUCTOR RATIO
A   TT.K=DCSIZE.K/SMOOTH(CSIZE.K,TST)
         TT       - CLASS SIZE ADJUSTMENT FACTOR
         DCSIZE   - DESIRED UPT CLASS SIZE
         CSIZE    - ANNUAL UPT CLASS SIZE
         ST       - SMOOTHING TIMES
A   TDEL.K=CAP.K*DEL
         TDEL     - AVG TIME THROUGH UPT PIPELINE
         CAP      - CAPACITY FACTOR FOR UPT TRAINING DELAY
         DEL      - INITIAL AVERAGE TIME IN UPT PIPELINE
A   CAP.K=TABHL(CAPT,CSIZE.K,0,6000,1000)
         CAP      - CAPACITY FACTOR FOR UPT TRAINING DELAY
         CAPT     - CAPACITY UTILIZATION FACTOR UPT TRAINING DELAY
         CSIZE    - ANNUAL UPT CLASS SIZE
T   CAPT=.8/1/1/1.1/1.2/1.25/1.3
         CAPT     - CAPACITY UTILIZATION FACTOR UPT TRAINING DELAY
A   PUPT.K=DLINF3(PREC.JK,PTDEL.K)
         PUPT     - PROJECTED UPT GRADUATES
         PREC     - PILOT CANDIDATE RECRUITING RATE
         PTDEL    - PERCEIVED TRAINING DELAY
A   PTDEL.K=SMOOTH(TDEL.K,ST)
         PTDEL    - PERCEIVED TRAINING DELAY
         TDEL     - AVG TIME THROUGH UPT PIPELINE
         ST       - SMOOTHING TIMES
A   DCSIZE.K=MAX(FORCE.K+PATT.K,VBL.K)
         DCSIZE   - DESIRED UPT CLASS SIZE
         FORCE    - PROGRAMMED FORCE SIZE MINUS ACTUAL FORCE SIZE
         PATT     - PROJECTED ANNUAL ATTRITION
         VBL      - CLASS SIZE FOR VIABLE UPT OPERATION
A   VBL.K=VBLD+TEST8.K
         VBL      - CLASS SIZE FOR VIABLE UPT OPERATION
         VBLD     - MINIMUN VIABLE UPT CLASS SIZE
         TEST8    - TEST ON VIABLE UPT CLASS SIZE
NOTE
NOTE
NOTE * * * * FORCE SIZE POLICY * * * *
NOTE
NOTE
A   PLANES.K(1)=0
         PLANES   - ACTIVE AIRCRAFT BY MISSION
A   PLANES.K(2)=0
         PLANES   - ACTIVE AIRCRAFT BY MISSION
A   PLANES.K(MPIL)=POLACFT.K(MPIL)*TEST2.K(MPIL)
         PLANES   - ACTIVE AIRCRAFT BY MISSION
         MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
         POLACFT  - ACTIVE AIRCRAFT BY CATEGORY
         TEST2    - TEST ON NUMBER OF AIRCRAFT
A   AHOURS.K(1)=0
         AHOURS   - AUTHORIZED MISSION FLYING HOURS
A   AHOURS.K(2)=0
         AHOURS   - AUTHORIZED MISSION FLYING HOURS
A   AHOURS.K(MPIL)=POLHRS*APP.K(MPIL)*TEST1.K(MPIL)
         AHOURS   - AUTHORIZED MISSION FLYING HOURS
         MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
        POLHRS    - TOTAL PROGRAMMED FLYING HOURS
         APP      - FLYING HOURS APPORTIONING FACTOR
         TEST1    - TEST ON AUTHORIZED HOURS
A   APP.K(1)=0
         APP      - FLYING HOURS APPORTIONING FACTOR
A   APP.K(2)=0
         APP      - FLYING HOURS APPORTIONING FACTOR
A   APP.K(MPIL)=DESHRS.K(MPIL)/TDHRS.K
         APP      - FLYING HOURS APPORTIONING FACTOR
         MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
         DESHRS   - DESIRED FLYING HOURS PER A/C FOR PROFICIENCY
         TDHRS    - TOTAL DESIRED MISSION FLYING HOURS
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```
A    DESHRS.K(1)=0
          DESHRS   - DESIRED FLYING HOURS PER A/C FOR PROFICIENCY
A    DESHRS.K(2)=0
          DESHRS   - DESIRED FLYING HOURS PER A/C FOR PROFICIENCY
A    DESHRS.K(MPIL)=DH.K(MPIL)*PLANES.K(MPIL)
          DESHRS   - DESIRED FLYING HOURS PER A/C FOR PROFICIENCY
          MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
          DH       - DESIRED FLYING HOURS PER AIRCRAFT
          PLANES   - ACTIVE AIRCRAFT BY MISSION
A    DH.K(1)=0
          DH       - DESIRED FLYING HOURS PER AIRCRAFT
A    DH.K(2)=0
          DH       - DESIRED FLYING HOURS PER AIRCRAFT
A    DH.K(MPIL)=DHC(MPIL)*TEST10.K(MPIL)
          DH       - DESIRED FLYING HOURS PER AIRCRAFT
          MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
          DHC      - DESIRED FLYING HOURS/ACFT CREW PROFFICIENCY
          TEST10   - TEST ON DSIRED FLYING HOURS
A    TDHRS.K=SUMV(DESHRS.K,3,TCAT)
          TDHRS    - TOTAL DESIRED MISSION FLYING HOURS
          DESHRS   - DESIRED FLYING HOURS PER A/C FOR PROFICIENCY
          TCAT     - CATEGORIES OF PILOT JOBS
A    PHPA.K(CAT)=AHOURS.K(CAT)/PLANES.K(CAT)
          PHPA     - PROGRAMMED FLYING HOURS PER AIRCRAFT
          CAT      - CATEGORY ITERATION INDEX
          AHOURS   - AUTHORIZED MISSION FLYING HOURS
          PLANES   - ACTIVE AIRCRAFT BY MISSION
A    DCRATIO.K(1)=0
          DCRATIO  - DESIRED CREW RATIO TO FLY PROGRAMMED HOURS
A    DCRATIO.K(2)=0
          DCRATIO  - DESIRED CREW RATIO TO FLY PROGRAMMED HOURS
A    DCRATIO.K(3)=TABHL(CRT3,PHPA.K(3),0,120,20)
          DCRATIO  - DESIRED CREW RATIO TO FLY PROGRAMMED HOURS
          CRT3     - CREW TABLE FIGHTERS
          PHPA     - PROGRAMMED FLYING HOURS PER AIRCRAFT
T    CRT3=0/.5/1/1.25/1.5/2/2.5
          CRT3     - CREW TABLE FIGHTERS
A    DCRATIO.K(4)=TABHL(CRT4,PHPA.K(4),0,150,25)
          DCRATIO  - DESIRED CREW RATIO TO FLY PROGRAMMED HOURS
          CRT4     - CREW TABLE BOMBERS
          PHPA     - PROGRAMMED FLYING HOURS PER AIRCRAFT
T    CRT4=0/2/2.75/3/3.25/4/6
          CRT4     - CREW TABLE BOMBERS
A    DCRATIO.K(5)=TABHL(CRT5,PHPA.K(5),0,240,40)
          DCRATIO  - DESIRED CREW RATIO TO FLY PROGRAMMED HOURS
          CRT5     - CREW TABLE TRANSPORTS
          PHPA     - PROGRAMMED FLYING HOURS PER AIRCRAFT
T    CRT5=0/3/3.75/4/4.25/5/8
          CRT5     - CREW TABLE TRANSPORTS
A    DFORCE.K(1)=MAX(FORSIZE.K-SUMV(DFORCE.K,2,TCAT)
X      -SUM(TRNG.K)-WIND.K,SSS)
          DFORCE   - DESIRED FORCE SIZE BY MISSION
          FORSIZE  - PROGRAMMED TOTAL FORCE SIZE
          TCAT     - CATEGORIES OF PILOT JOBS
          TRNG     - PILOTS IN W/S TRAINING
          WIND     - PILOTS IN REALLOCATION PROCESS
          SSS      - VIABILITY LEVEL FOR RATED SUPPLEMENT
A    DFORCE.K(2)=MAX((SMOOTH(DCSIZE.K,DST)/TPINSI),III.K)
          DFORCE   - DESIRED FORCE SIZE BY MISSION
          DCSIZE   - DESIRED UPT CLASS SIZE
          DST      - SMOOTHING TIMES
          TPINSI   - DESIRED STUDENT/INSTRUCTOR RATIO
          III      - MINIMUM INSTRUCTOR FORCE FOR UPT VIABILITY
A    DFORCE.K(MPIL)=DCRATIO.K(MPIL)*PLANES.K(MPIL)
          DFORCE   - DESIRED FORCE SIZE BY MISSION
          MPIL     - INDEX FOR NON-INSTRUCTOR FLYING JOBS
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           DCRATIO - DESIRED CREW RATIO TO FLY PROGRAMMED HOURS
           PLANES  - ACTIVE AIRCRAFT BY MISSION
A    III.K=IIID+TEST9.K
           III     - MINIMUM INSTRUCTOR FORCE FOR UPT VIABILITY
           IIID    - VIABLE FORCE LEVEL INSTRUCTOR PILOT
           TEST9   - TEST ON INSTRUCTOR FORCE MINIMUM VIABILITY
A    DTMFOR.K=SUMV(DFORCE.K,2,TCAT)
           DTMFOR  - DESIRED TOTAL MISSION FORCE
           DFORCE  - DESIRED FORCE SIZE BY MISSION
           TCAT    - CATEGORIES OF PILOT JOBS
A    DFDSC.K(CAT)=DFORCE.K(CAT)-JOB.K(CAT)
           DFDSC   - IN PLACE FORCE DISCREPANCY
           CAT     - CATEGORY ITERATION INDEX
           DFORCE  - DESIRED FORCE SIZE BY MISSION
           JOB     - PILOTS IN EACH CATEGORY
A    TODFOR.K=SUM(DFORCE.K)+TEST3.K
           TODFOR  - DESIRED IN PLACE FORCE SIZE
           DFORCE  - DESIRED FORCE SIZE BY MISSION
           TEST3   - TEST ON DESIRED TOTAL FORCE SIZE
A    FORSIZE.K=FORCEIL+TEST7.K
           FORSIZE - PROGRAMMED TOTAL FORCE SIZE
           FORCEIL -  IMPOSED PILOT FORCE CEILING
           TEST7   - TEST ON PROGRAMMED TOTAL FORCE SIZE
N    FORCEIL=SUM(JOBI)+SUM(IWIND)+SUM(TRNG)
NOTE
NOTE
NOTE * * * * CURRENT FORCE MANAGEMENT PARAMETERS * * * *
NOTE
NOTE
A    TOTFOR.K=SUM(JOB.K)+SUM(TRNG.K)+WIND.K
           TOTFOR  - TOTAL PILOT FORCE
           JOB     - PILOTS IN EACH CATEGORY
           TRNG    - PILOTS IN W/S TRAINING
           WIND    - PILOTS IN REALLOCATION PROCESS
A    FORCE.K=FORSIZE.K-(TOTFOR.K-PATT.K)-4*PUPT.K
           FORCE   - PROGRAMMED MINUS ACTUAL FORCE SIZE
           FORSIZE - PROGRAMMED TOTAL FORCE SIZE
           TOTFOR  - TOTAL PILOT FORCE
           PATT    - PROJECTED ANNUAL ATTRITION
           PUPT    - PROJECTED UPT GRADUATES
A    PATT.K=4*SMOOTH(SUM(ATT.JK),AST)
           PATT    - PROJECTED ANNUAL ATTRITION
           ATT     - PILOT ATTRITION RATE BY CATEGORY
           ST      - SMOOTHING TIMES
A    ATTADJ.K(CAT)=TABHL(TATADJ,FLEV.K,.5,2,.5)
           ATTADJ  - ATTRITION ADJUSTMENT FACTOR
           CAT     - CATEGORY ITERATION INDEX
           TATADJ  - ATT RATE ADJUSTMENT TABLE
           FLEV    - FORCE LEVEL FACTOR FOR ATTRITION ADJUSTMENT
T    TATADJ=.5/1/1.5/2
           TATADJ  - ATT RATE ADJUSTMENT TABLE
A    FLEV.K(CAT)=(TOTFOR.K/(TOTFOR.K+FORCE.K))*TEST5.K(CAT)
           FLEV    - FORCE LEVEL FACTOR FOR ATTRITION ADJUSTMENT
           CAT     - CATEGORY ITERATION INDEX
           TOTFOR  - TOTAL PILOT FORCE
           FORCE   - PROGRAMMED MINUS ACTUAL FORCE SIZE
A    CRATIO.K(1)=0
           CRATIO  - ACTUAL CREW RATIOS
A    CRATIO.K(2)=0
           CRATIO  - ACTUAL CREW RATIOS
A    CRATIO.K(MPIL)=JOB.K(MPIL)/PLANES.K(MPIL)
           CRATIO  - ACTUAL CREW RATIOS
           MPIL    - INDEX FOR NON-INSTRUCTOR FLYING JOBS
           JOB     - PILOTS IN EACH CATEGORY
           PLANES  - ACTIVE AIRCRAFT BY MISSION
A    FOEFC.K=SUMV(JOB.K,3,TCAT)/SUMV(DFORCE.K,3,TCAT)
```

```
         FOEFC    - SPECIFIC EFFICIENCY OF FORCE
         JOB      - PILOTS IN EACH CATEGORY
         TCAT     - CATEGORIES OF PILOT JOBS
         DFORCE   - DESIRED FORCE SIZE BY MISSION
A    TRNGFC.K=(SUM(TRNG.K)+WIND.K)/TOTFOR.K
         TRNGFC   - PIPELINE EFFICIENCY
         TRNG     - PILOTS IN W/S TRAINING
         WIND     - PILOTS IN REALLOCATION PROCESS
         TOTFOR   - TOTAL PILOT FORCE
A    TOTHRS.K=SUMV(AHOURS.K,3,TCAT)
         TOTHRS   - TOTAL AUTHORIZED MISSION FLYING HOURS
         AHOURS   - AUTHORIZED MISSION FLYING HOURS
         TCAT     - CATEGORIES OF PILOT JOBS
A    TOTACFT.K=SUMV(PLANES.K,3,TCAT)
         TOTACFT  - TOTAL AVAILABLE MISSION AIRCRAFT
         PLANES   - ACTIVE AIRCRAFT BY MISSION
         TCAT     - CATEGORIES OF PILOT JOBS
A    HFPP.K(CAT)=AHOURS.K(CAT)/JOB.K(CAT)
         HFPP     - HOURS PER PILOT PER MISSION CAT
         CAT      - CATEGORY ITERATION INDEX
         AHOURS   - AUTHORIZED MISSION FLYING HOURS
         JOB      - PILOTS IN EACH CATEGORY
NOTE
NOTE
NOTE * * * * INITIAL VALUES AND CONSTANTS * * * *
NOTE
NOTE
T    JOBI=3425/640/4375/3000/3600
         JOBI     - INITIAL FORCE SIZE BY CATEGORY
T    ATTRATE=.02/.02/.02/.02/.02
         ATTRATE  - PROGRAMMED ATTRITION RATE BY CATEGORY
T    ATADJTM=1/1/1/1/1
         ATADJTM  - ATTRITION RATE ADJUSTMNET TIME BY CATEGORY
T    ATJC=12/15/12/12/12
         ATJC     - AVERAGE TIME IN JOB BY CATEGORY
T    ATJTIME=0/0/0/0/0
         ATJTIME  - AVG TIME TO ADJUST PILOT FORCE
T    ATUPGD=1/1.3/1.9/2.2/1.4
         ATUPGD   - AVG TIME IN UPGRADE/REASSIGNMENT PIPELINE
C    DEL=7/TPINSI=1.88/VBLC=400
         DEL      - INITIAL AVERAGE TIME IN UPT PIPELINE
         TPINSI   - DESIRED STUDENT/INSTRUCTOR RATIO
         VBLC     - MINIMUN VIABLE UPT CLASS SIZE
         FORCEIL  - IMPOSED PILOT FORCE CEILING
C    POLHRS=393000/ST=8/CST=1/AST=4/TST=1/SSS=500/IIIC=200
        POLHRS    - TOTAL PROGRAMMED FLYING HOURS
        ST        - SMOOTHING TIMES
        SSS       - VIABILITY LEVEL FOR RATED SUPPLEMENT
        IIIC      - VIABLE FORCE LEVEL INSTRUCTOR PILOT
T    POLACFT=0/0/3500/1100/900
         POLACFT  - ACTIVE AIRCRAFT BY CATEGORY
T    DHC=0/0/60/75/120
         DHC      - DESIRED FLYING HOURS/ACFT CREW PROFFICIENCY
NOTE
NOTE
NOTE * * * * TEST INPUTS * * * *
NOTE
NOTE
A    TEST1.K(CAT)=RAMP(RS11(CAT),RT11(CAT))
X      +RAMP(RS12(CAT),RT12(CAT))+1
         TEST1    - TEST ON AUTHORIZED HOURS
         CAT      - CATEGORY ITERATION INDEX
A    TEST2.K(CAT)=1
X      +RAMP(RS21(CAT),RT21(CAT))+RAMP(RS22(CAT),RT22(CAT))
         TEST2    - TEST ON NUMBER OF AIRCRAFT
T    RS11=0/0/0/0/0
```

```
T    RS12=0/0/0/0/0
T    RS21=0/0/0/0/0
T    RS22=0/0/0/0/0
T    RT11=0/0/4/4/4
T    RT12=0/0/20/20/20
T    RT21=0/0/4/4/4
T    RT22=0/0/20/20/20
A    TEST3.K=TC
C    TC=0
          TEST3    - TEST ON DESIRED TOTAL FORCE SIZE
A    TEST4.K(CAT)=1+N4(CAT)*NOISE()+STEP(H4(CAT),TS4(CAT))
X      +SA4(CAT)*SIN(6.283*TIME.K/P4(CAT))
          TEST4    - TEST ON ATTRITION RATE
T    H4=0/0/0/0/0
T    TS4=4/4/4/4/4
T    SA4=0/0/0/0/0
T    P4=20/20/20/20/20
T    N4=0/0/0/0/0
A    TEST5.K(CAT)=1
A    TEST6.K=0
A    TEST7.K=RAMP(RS71,RT71)+RAMP(RS72,RT72)+
X      TABHL(TEFF,TIME.K,0,80,4)
          TEST7    - TEST ON PROGRAMMED TOTAL FORCE SIZE
T    TEFF=0/0/0/0/0/0/0/0/0/0/0/0/0/0/0/0/0/0/0/0/0
C    RS71=0/RS72=0/RT71=0/RT72=0
A    TEST8.K=0
          TEST8    - TEST ON VIABLE UPT CLASS SIZE
A    TEST9.K=0
          TEST9    - TEST ON INSTRUCTOR FORCE MINIMUM VIABILITY
A    TEST10.K(CAT)=1+STEP(H10(CAT),TS10(CAT))
          TEST10   - TEST ON DSIRED FLYING HOURS
T    H10=0/0/0/0/0
T    TS10=0/0/0/0/0
A    TEST11.K(CAT)=1
          TEST11 - TEST ON AVG TIME IN FLYING CATEGORY
A    TEST12.K(CAT)=1
          TEST12 - TEST ON ASSIGNMENT RATE TO PILOT CATEGORY
NOTE
NOTE
NOTE * * * * PRINTING AND PLOTTING SPECIFICATIONS * * * *
NOTE
NOTE
PRINT 1)JOB/2)TRNG/3)NEED/4)DFORCE/5)ATT/6)WIND,TPINS,CAP
X  ,TONEED,FORCE/7)DTMFOR,TOTFOR,TOOFOR,CSIZE,DCSIZE
PRINT 1)MEPP/2)DFDSC/3)PATT,PREC,TRNGFC,FDEFC,TDEL/4)CRATIO
X  /5)DCRATIO/6)AFDJ/7)HOURS
PLOT JOB(1)=S/JOB(2)=T/JOB(3)=F/JOB(4)=B/JOB(5)=A/TOTFOR=T
X    ,FORSIZE=*
PLOT TRNG(1)=1/TRNG(2)=2/TRNG(3)=3
X    /TRNG(4)=4/TRNG(5)=5/WIND=W
PLOT PREC=R,UPT=G/CSIZE=C,DCSIZE=D/TPINS=X/FDEFC=E/TRNGFC=0
PLOT DFDSC
PLOT CRATIO(3),DCRATIO(3)/CRATIO(4),DCRATIO(4)/
X    CRATIO(5),DCRATIO(5)
PRINT 1)SCOST,PCOST,TCOST,UCOST/2)RCOST,ACOST,TOTCOST,DCOST/3)TRAV
A    TRAV.K=WIND.K/SUM(TOJOB.JK)
NOTE
NOTE
NOTE * * * * RUN SPECIFICATIONS * * * *
NOTE
NOTE
SPEC LENGTH=100/DT=.125/PLTPER=1/PRTPER=4
NOTE
NOTE
NOTE * * * * COST MODULE * * * *
NOTE
```

```
NOTE
A    SAL.K=TOTFOR.K*SCF.K
L    SCOST.K=SCOST.J+DT*SAL.J
N    SCOST=0
           SCOST    - PILOT SALARIES
A    PCS.K=WIND.K*PCF.K
L    PCOST.K=PCOST.J+DT*PCS.J
N    PCOST=0
           PCOST    - PCS COSTS
A    TRAIN.K=SUM(TJOB.JK)*TCF.K
L    TCOST.K=TCOST.J+DT*TRAIN.J
N    TCOST=0
           TCOST    - COTS COSTS
A    UPTT.K=UPT.JK*UCF.K
L    UCOST.K=UCOST.J+DT*UPTT.J
N    UCOST=0
           UCOST    - UPT COSTS
A    RECR.K=PREC.K*RCF.K
L    RCOST.K=RCOST.J+DT*RECR.J
N    RCOST=0
           RCOST    - RECRUITING COSTS
A    ATCST.K=SUM(ATT.JK)*ACF.K
L    ACOST.K=ACOST.J+DT*ATCST.J
N    ACOST=0
           ACOST    - ATTRITION COSTS
A    TOTCOST.K=SCOST.K+PCOST.K+TCOST.K+UCOST.K
X    +RCOST.K+ACOST.K
           TOTCOST  - TOTAL COST
A    SCF.K=SCFK
A    PCF.K=PCFK
A    TCF.K=TCFK
A    UCF.K=UCFK
A    RCF.K=RCFK
A    ACF.K=ACFK
C    SCFK=6000/PCFK=2000/TCFK=215000/UCFK=235000
C    RCFK=13000/ACFK=2500
A    DFACT.K=1/EXP(.025*TIME.K)
           DFACT    - DISCOUNT FACTOR
A    QTRCST.K=SAL.K+PCS.K+TRAIN.K+UPTT.K+RECR.K+ATCST.K
A    DQTR.K=QTRCST.K*DFACT.K
N    DCOST=0
L    DCOST.K=DCOST.J+DT*DQTR.J
           DCOST    - TOTAL COST DISCOUNTED
RUN
TP   JOBI=437.5/995/8750/6000/7200
TP   POLACFT=0/0/7000/2000/1800
CP   POLHRS=785000
CP   RS71=-10988/RT71=4/RS72=10988/RT72=5
RUN  00F0
T    RS21=0/0/-.5/-.5/-.5
T    RT21=0/0/4/4/4
T    RS22=0/0/.5/.5/.5
T    RT22=0/0/5/5/5
RUN  01P
TP   RS11=0/0/-.5/-.5/-.5
TP   RT11=0/0/4/4/4
TP   RS12=0/0/.5/.5/.5
TP   RT12=0/0/5/5/5
RUN  02A
T    RS21=0/0/-.5/-.5/-.5
T    RT21=0/0/4/4/4
T    RS22=0/0/.5/.5/.5
T    RT22=0/0/5/5/5
RUN  03B
```

APPENDIX C

FORCE BUILD-UP LISTING

APPENDIX C

Force Build-Up Listing

The first part of the appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

C--Build-up

CHANGES FOR RERUN - B1A

ORIGINAL RS11	0.000	0.000	0.000	0.000	0.000
PRESENT RS11	0.000	0.000	1.000	1.000	1.000
ORIGINAL RT11	0.000	0.000	4.000	4.000	4.000
PRESENT RT11	0.000	0.000	4.000	4.000	4.000
ORIGINAL RS12	0.000	0.000	0.000	0.000	0.000
PRESENT RS12	0.000	0.000	-1.000	-1.000	-1.000
ORIGINAL RT12	0.000	0.000	20.000	20.000	20.000
PRESENT RT12	0.000	0.000	5.000	5.000	5.000
ORIGINAL RS71	0.000				
PRESENT RS71	10.975T				
ORIGINAL RT71	0.000				
PRESENT RT71	4.000				
ORIGINAL RS72	0.000				
PRESENT RS72	-10.975T				
ORIGINAL RT72	0.000				
PRESENT RT72	5.000				

ABOVE RANGE OF TABLE TREC AT TIME 0.00
IN RANGE OF TABLE TREC AT TIME 0.00

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PAGE  49  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            81A

  TIME       JOB      TRNG       NEED   DFORCE       ATT      WIND  DTMFOR
               2         2          2        2         2    TRINS  TOTFOR
               3         3          3        3         3      CAP  TODFOR
               4         4          4        4         4   TONEED   DSIZE
               5         5          5        5         5    FORCE  DDSIZE
            HFPP     DFOST       PATT   CRATIO    DDRATI      ATJ  AHOURS
               2         2       PREC        2         2        2       2
               3         3     TRNGFC        3         3        3       3
               4         4      FOEFC        4         4        4       4
               5         5       TOEL        5         5        5       5
           SCOST     RCOST       TRAV
           PCOST     ACOST
           TCOST    TOTCOST
           UCOST     DCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   E-00     E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-00     E-00      E-00     E-00    E-00
            E-00      E-00       E-03     E-00      E-00     E-00    E 03
            E-00      E-00       E-00     E-00      E-00     E-00    E 03
            E-00      E-00       E-00     E-00      E-00     E-00    E 03
            E 05      E 05       E-00
            E 06      E 05
            E 06      E 05
            E 05      E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   0.00   3425.0    353.92       0.00   3425.0    63.500   1540.8  11515.
           640.0     69.54       52.8    640.0    12.300   1.8800  13055.
          4375.0     859.3      452.1   4375.0     87.50   1.0000  15040.
          3000.0     582.?      310.0   3000.0     60.00    1187.  1203.2
          3600.0     520.?      372.0   3600.0     72.00       0.   1203.
              0.       0.0     1203.2       0.        0.   12.000      0.
              0.       0.0      300.8       0.        0.   16.000      0.
          48.000       -.0     211.12   1.2500    1.2500   12.000  210.00
          25.000       -.0     1.0000   3.0000    3.0000   12.000   75.00
          30.000       -.0     7.0000   4.0000    4.0000   12.000  108.00
              0.      0.00     1.0000
            0.00      0.00
              0.        0.
              0.        0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

4.00	3425.0	753.92	0.00	3425.0	68.500	1540.8	11515.
	640.0	58.5	52.8	640.0	12.300	1.8800	13055.
	4375.0	853.0	452.1	4375.0	87.50	1.0000	15040.
	3000.0	582.0	310.0	3000.0	60.00	1187.	1203.2
	3600.0	520.8	372.0	3600.0	72.00	0.	1203.
	0.	.0	1203.2	0.	0.	12.000	0.
	0.	.0	300.8	0.	0.	16.000	0.
	48.000	.0	211.12	1.2500	1.2500	12.000	210.00
	25.000	.0	1.0000	3.0000	3.0000	12.000	75.00
	30.000	.0	7.0000	4.0000	4.0000	12.000	108.00
	456.	15.64	1.0000				
	12.33	3.01					
	1325.	2096.					
	283.	1398.					
8.00	753.1	5.54	0.00	500.0	9.327	1332.6	27821.
	1602.9	585.31	4307.0	5871.1	21.129	4.0000	13375.
	5233.5	911.1	3848.6	8750.0	58.98	1.3000	23321.
	3499.7	720.0	2718.7	6000.0	46.13	14140.	5411.8
	4195.8	535.1	3265.9	7200.0	55.31	10023.	10957.
	0.	-253.1	943.8	0.	0.	6.268	0.
	0.	4268.2	1314.4	0.	0.	16.000	0.
	80.252	3516.5	211.13	1.4953	2.5000	12.000	420.00
	42.861	2500.3	.5890	3.4997	5.0000	12.000	150.00
	51.430	3004.2	9.1000	4.5620	8.0000	12.000	216.00
	918.	58.37	.7986				
	25.84	5.03					
	2715.	4271.					
	548.	3871.					
12.00	385.2	7.55	114.76	500.0	5.582	1342.4	25835.
	2733.5	392.17	2319.4	4935.3	39.611	2.4124	20193.
	5455.5	731.5	3651.9	8750.0	79.05	1.3000	27385.
	3705.6	593.4	2534.9	6000.0	63.70	11704.	5594.4
	4400.0	452.1	3083.5	7200.0	63.76	7579.	3593.
	0.	114.5	913.9	0.	0.	7.273	0.
	0.	2201.3	1351.9	0.	0.	16.000	0.
	76.987	3294.5	174.22	1.5587	2.5000	12.000	420.00
	40.479	2294.4	.6178	3.7056	5.0100	12.000	150.00
	49.031	2830.0	9.1000	4.8889	8.0000	12.000	216.00
	1391.	132.15	1.0454				
	35.81	7.27					
	3923.	6429.					
	940.	5555.					

16.00	318.4	30.50	181.58	500.0	5.327	1834.5	25247.
	2990.7	212.07	512.3	3296.7	30.034	1.7703	22331.
	5744.8	1054.3	3400.4	8750.0	36.11	1.2647	25747.
	3917.1	826.1	2351.0	6000.0	55.53	9241.	5294.3
	4728.6	573.1	2795.6	7200.0	73.11	4365.	5336.
	0.	181.5	1021.7	0.	0.	8.261	0.
	0.	305.0	1120.7	0.	0.	16.000	0.
	73.109	3005.2	207.41	1.6414	2.5000	12.000	420.00
	38.234	2082.3	.6556	3.9171	5.0000	12.000	150.00
	45.680	2471.4	8.8530	5.2540	8.0000	12.000	216.00
	1899.	197.57	1.1529				
	48.35	9.32					
	5123.	8962.					
	1680.	7340.					
20.00	356.7	48.73	143.32	500.0	6.372	2443.8	23543.
	2316.8	14.90	0.0	1592.8	44.537	1.1985	25625.
	6626.3	1576.4	2639.4	8750.0	127.67	1.0777	24043.
	4509.8	1238.3	1839.1	6000.0	86.89	6736.	2775.6
	5518.4	975.0	2114.4	7200.0	106.32	975.	2207.
	0.	143.3	1231.5	0.	0.	9.670	0.
	0.	-724.0	694.1	0.	0.	16.000	0.
	63.384	2123.7	245.74	1.8932	2.5000	12.000	420.00
	33.251	1490.2	.7587	4.5098	5.0000	12.000	150.00
	39.142	1581.5	7.5436	6.1316	8.0000	12.000	216.00
	2470.	248.11	1.1476				
	65.30	13.21					
	6703.	12261.					
	2755.	9443.					
24.00	423.8	56.03	76.25	500.0	8.984	2952.2	22239.
	1140.2	.53	0.0	289.1	24.173	.7418	23277.
	7878.7	2050.3	1589.3	8750.0	157.04	.9692	22739.
	5376.9	1530.5	1111.0	6000.0	114.00	4046.	345.8
	6530.0	1237.3	1269.0	7200.0	138.44	-1658.	400.
	0.	75.2	1519.3	0.	0.	11.291	0.
	0.	-851.2	211.4	0.	0.	16.000	0.
	53.308	871.7	270.77	2.2511	2.5000	12.000	420.00
	27.897	523.1	.9014	5.3769	5.0000	12.000	150.00
	33.078	570.0	6.7841	7.2555	8.0000	12.000	216.00
	3123.	258.27	1.0748				
	87.24	17.32					
	8810.	15313.					
	4007.	11737.					

28.00	753.0	437.39	0.00	500.0	15.388	2711.3	22154.
	471.7	.02	0.0	213.8	9.952	1.2067	31001.
	8820.5	1883.1	832.3	8750.0	136.09	.9138	22554.
	6056.2	1520.3	563.7	6000.0	127.77	2099.	559.2
	7237.5	1109.1	702.9	7200.0	152.69	-1513.	400.
	0.	-253.0	1772.1	0.	0.	12.229	0.
	0.	-257.9	142.3	0.	0.	16.000	0.
	47.615	-70.5	247.16	2.5202	2.5000	12.000	420.00
	24.768	-56.7	1.0075	6.0562	5.0000	12.000	150.00
	29.845	-37.5	6.3968	8.0415	3.0000	12.000	216.00
	3857.	277.39	.9300				
	110.08	22.07					
	11265.	20407.					
	4874.	13926.					
32.00	1442.4	184.37	0.00	500.0	29.031	2557.7	22653.
	426.7	213.49	305.3	703.1	3.588	3.2427	30733.
	8744.4	1576.9	908.9	8750.0	175.99	1.0000	23153.
	6004.3	1316.9	616.7	6000.0	120.85	2583.	1333.7
	7189.6	1036.1	752.2	7200.0	144.70	-193.	1636.
	0.	-942.4	1889.8	0.	0.	11.847	0.
	0.	275.3	345.9	0.	0.	16.000	0.
	48.031	5.5	226.85	2.4984	2.5000	12.000	420.00
	24.982	-4.3	.9995	6.0043	5.0000	12.000	150.00
	30.043	10.1	7.0000	7.9985	5.0000	12.000	216.00
	4601.	288.39	.9919				
	131.13	26.97					
	13650.	23935.					
	5297.	15627.					
36.00	745.4	2.57	0.00	500.0	14.571	2255.7	23242.
	1173.0	281.31	199.8	1291.9	22.929	2.1177	29936.
	8645.7	1506.9	989.6	8750.0	159.01	1.0484	23742.
	5927.3	1279.3	679.6	6000.0	115.87	2587.	2484.0
	7110.1	963.5	817.7	7200.0	138.99	694.	2571.
	0.	-245.4	1877.2	0.	0.	11.801	0.
	0.	118.9	621.0	0.	0.	16.000	0.
	48.579	104.3	213.19	2.4702	2.5000	12.000	420.00
	25.307	72.7	.9878	5.9273	5.0000	12.000	150.00
	30.379	89.3	7.3388	7.9002	8.0000	12.000	216.00
	5331.	313.94	.9617				
	150.27	31.67					
	15777.	27155.					
	5551.	16991.					

40.00	463.8	8.41	36.17	500.0	3.111	2270.7	23271.
	1357.6	119.60	72.6	1320.9	25.666	1.7922	23548.
	8540.9	1623.3	1073.5	8750.0	157.77	1.0433	23771.
	5857.1	1286.7	735.8	6000.0	115.05	2900.	2433.0
	7029.5	983.[illegible]	881.9	7200.0	138.08	537.	2335.
	0.	36.2	1847.5	0.	0.	11.750	0.
	0.	-36.7	608.3	0.	0.	16.000	0.
	49.175	209.1	213.17	2.4403	2.5000	12.000	420.00
	25.610	142.3	.9762	5.8571	6.0000	12.000	150.00
	30.727	170.4	7.3031	7.8107	8.0000	12.000	216.00
	6044.	346.90	1.0115				
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	17732.	30193.					
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	1120.8	21.35	5.2	1024.9	22.461	1.6650	23750.
	8588.5	1728.7	1033.1	6750.0	172.12	1.0000	23475.
	5885.4	1369.7	711.6	6000.0	117.95	2544.	1355.1
	7074.6	1051.1	843.9	7200.0	141.78	-61.	1731.
	0.	50.2	1842.3	0.	0.	11.840	0.
	0.	-95.8	466.5	0.	0.	16.000	0.
	48.903	161.5	222.89	2.4538	2.5000	12.000	420.00
	25.487	114.5	.9817	5.8854	6.0000	12.000	150.00
	30.532	125.1	7.0000	7.8607	8.0000	12.000	216.00
	6755.	375.32	1.0287				
	186.92	40.84					
	19700.	33404.					
	6347.	19284.					
48.00	483.0	95.02	17.00	500.0	3.761	2457.4	22733.
	850.5	48.13	58.5	333.4	17.189	1.9250	30118.
	8749.3	1755.7	902.4	8750.0	176.83	1.0000	23233.
	5998.3	1406.4	619.7	6000.0	121.23	2340.	1552.2
	7200.3	1064.1	742.0	7200.0	145.52	-313.	1547.
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	29.999	-.3	7.0000	8.0003	8.0000	12.000	216.00
	7473.	397.17	.9998				
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52.00	658.5	79.30	0.00	500.0	13.220	2424.9	22353.
	358.3	129.98	113.7	903.0	17.230	2.0014	30211.
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	24.991	-4.6	1.0003	6.0046	6.0000	12.000	150.00
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	8199.	417.37	.9941				
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	23882.	40115.					
	7341.	21312.					
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	1003.3	144.40	105.8	1029.8	20.102	1.9456	30092.
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	5998.3	1364.7	621.4	6000.0	119.59	2377.	1353.1
	7200.4	1040.9	743.7	7200.0	143.54	97.	1374.
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	48.005	.3	220.74	2.4997	2.5000	12.000	420.00
	25.007	1.7	.9999	5.9983	6.0000	12.000	150.00
	29.998	-.4	7.0000	8.0005	8.0000	12.000	215.00
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	7755.	22158.					
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	48.139	25.2	219.94	2.4928	2.5000	12.000	420.00
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	30.095	22.7	7.0000	7.9743	8.0000	12.000	216.00
	9642.	467.51	.9957				
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	27999.	46603.					
	8170.	22917.					

64.00	454.9	43.49	45.07	500.0	9.100	2390.9	22953.
	1017.5	92.14	71.1	1003.5	20.353	1.8436	30002.
	8722.4	1717.2	926.4	8750.0	174.48	1.0000	23453.
	5980.1	1362.9	636.0	6000.0	119.62	2439.	1375.8
	7179.2	1041.2	760.7	7200.0	143.61	-5.	1353.
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	0.	-14.0	469.0	0.	0.	16.000	0.
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	25.093	19.9	.9969	5.9801	6.0000	12.000	150.00
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	30040.	49952.					
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68.00	456.0	43.39	43.95	500.0	9.135	2399.2	22923.
	975.0	98.25	79.0	972.8	19.529	1.8727	30048.
	8743.9	1724.9	908.8	8750.0	175.14	1.0000	23423.
	5995.7	1370.0	623.3	6000.0	120.09	2403.	1325.9
	7195.1	1045.5	747.7	7200.0	144.12	-44.	1825.
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	47.992	-1.4	221.93	2.5004	2.5000	12.000	420.00
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75.00	455.2	43.37	44.77	500.0	9.100	2387.9	22950.
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	8746.7	1712.5	907.0	8750.0	174.85	1.0000	23450.
	5997.8	1359.3	621.8	6000.0	119.90	2406.	1531.7
	7197.0	1038.2	746.5	7200.0	143.97	14.	1835.
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	48.018	3.3	221.46	2.4991	2.5000	12.000	420.00
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	7191.6	1040.1	750.8	7200.0	143.83	0.	1370.
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	25.030	7.3	.9988	5.9927	5.0000	12.000	150.00
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	5994.9	1363.0	624.1	6000.0	119.92	2410.	1354.3
	7193.9	1040.7	748.9	7200.0	143.91	-6.	1355.
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	992.0	107.04	83.2	993.4	19.341	1.8826	30043.
	8743.9	1715.7	909.1	8750.0	174.89	1.0000	23443.
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	15403.	652.20	.9998				
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	44435.	72719.					
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	994.7	107.33	83.1	995.9	19.392	1.8820	30040.
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	7194.2	1039.7	748.7	7200.0	143.97	2.	1373.
	0.	44.1	1370.6	0.	0.	11.990	0.
	0.	1.2	468.0	0.	0.	16.000	0.
	48.038	7.0	221.61	2.4980	2.5000	12.000	420.00
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	995.8	106.72	82.7	996.4	19.315	1.6803	30039.
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	5994.5	1361.5	624.4	6000.0	119.88	2411.	1372.5
	7193.5	1039.9	749.3	7200.0	143.86	2.	1373.
	0.	44.2	1870.5	0.	0.	11.989	0.
	0.	.5	468.1	0.	0.	16.000	0.
	48.043	7.9	221.61	2.4977	2.5000	12.000	420.00
	25.023	5.4	.9991	5.9946	6.0000	12.000	150.00
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- -

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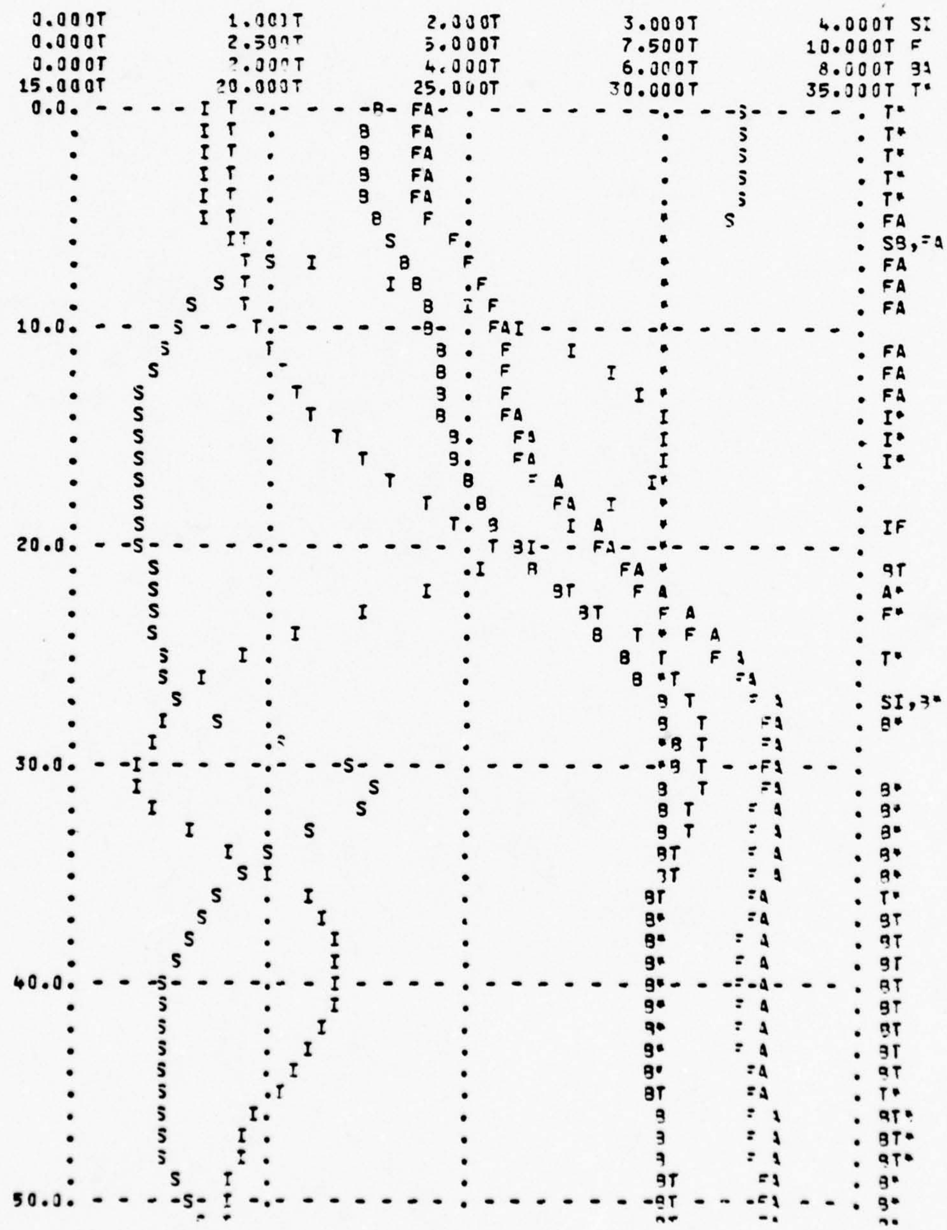

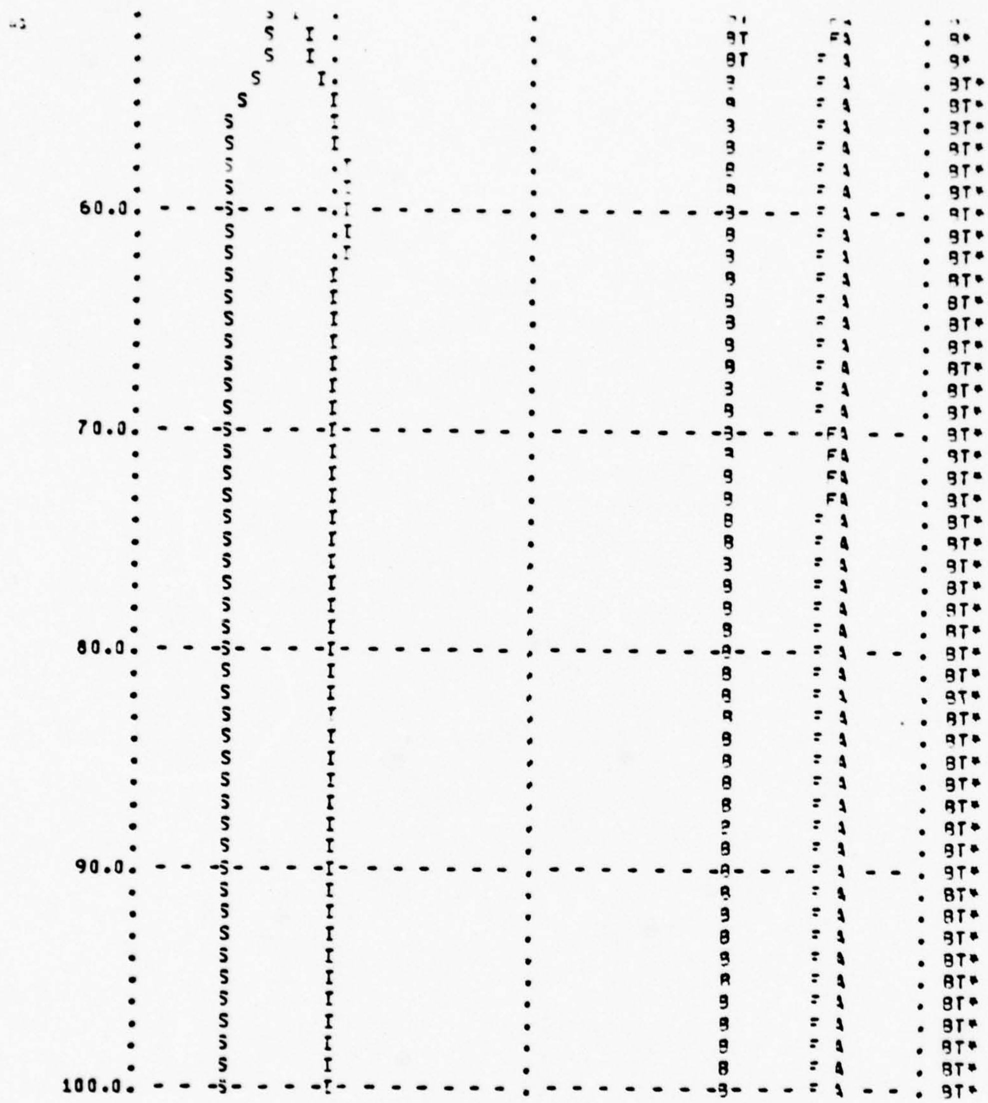
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PAGE 50 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL 81A

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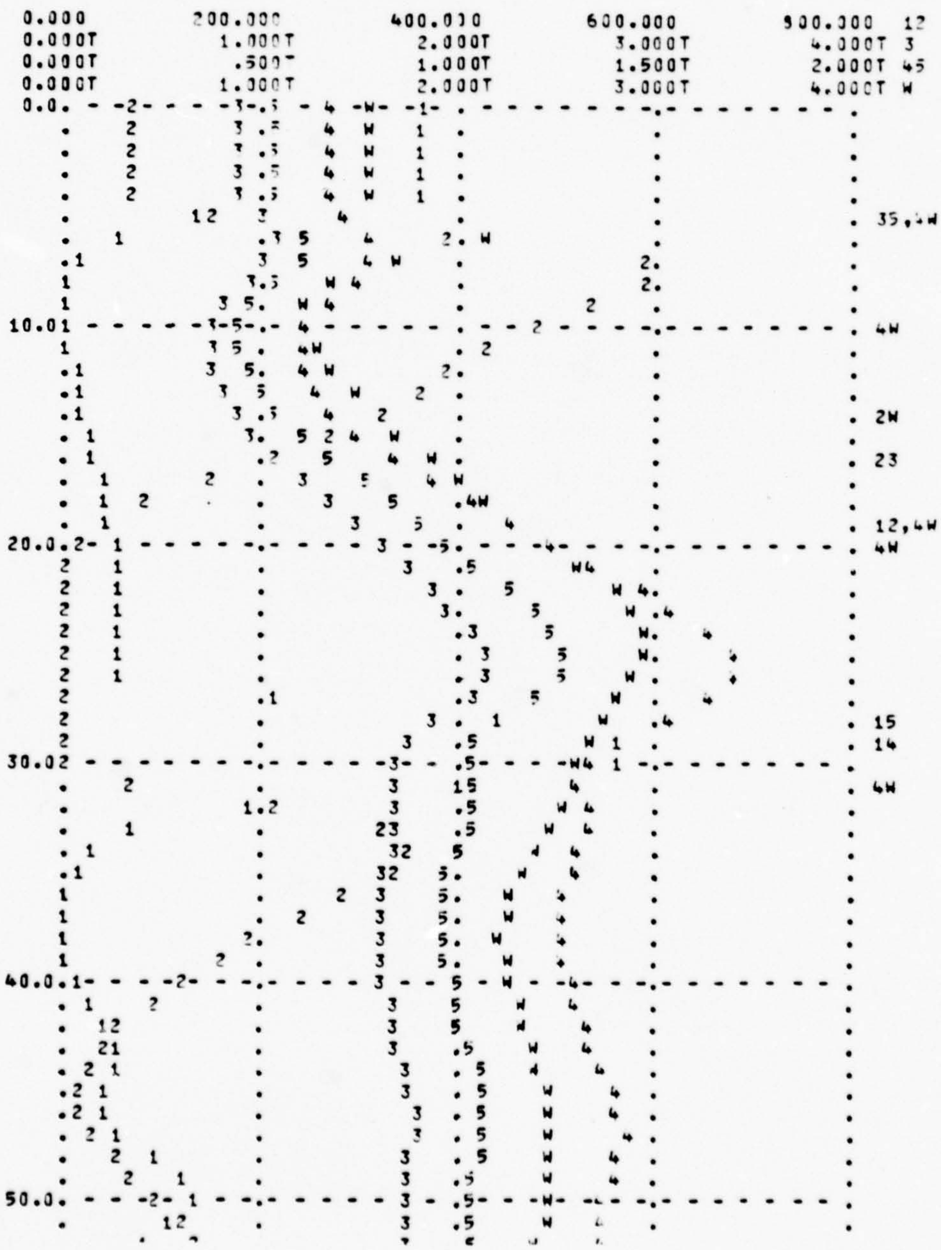

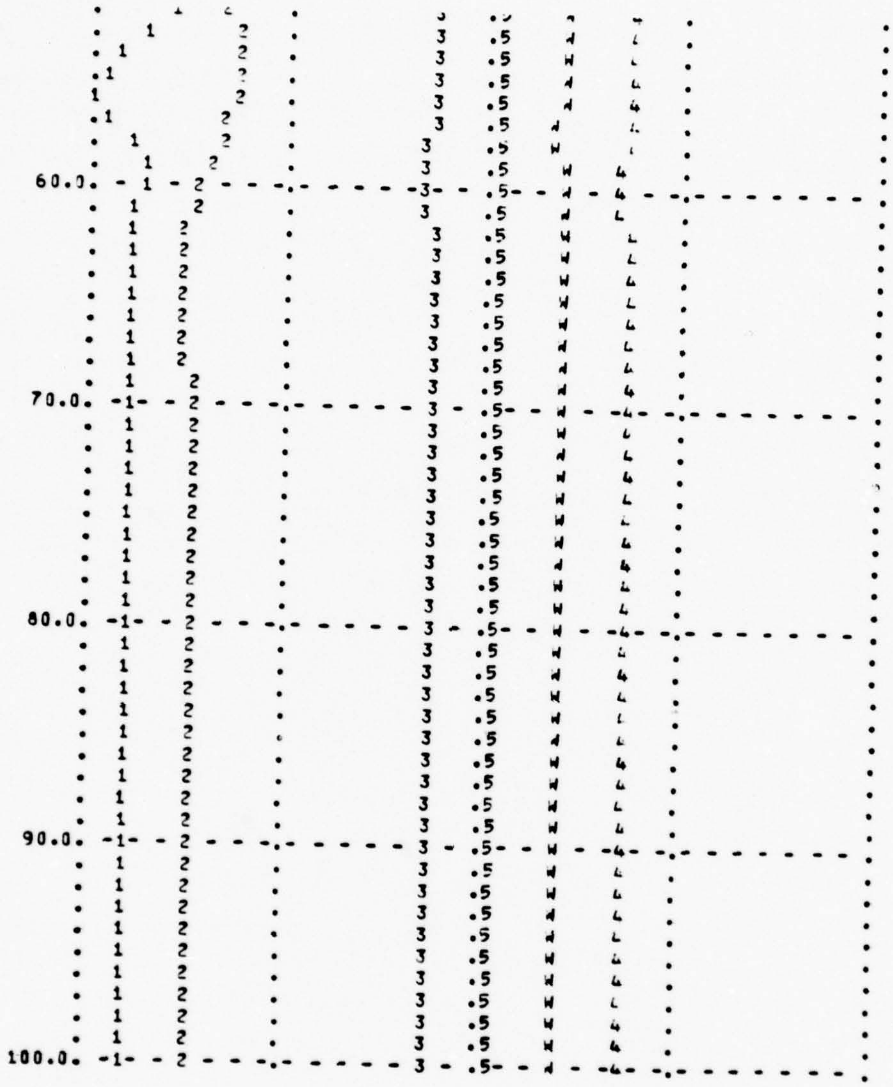
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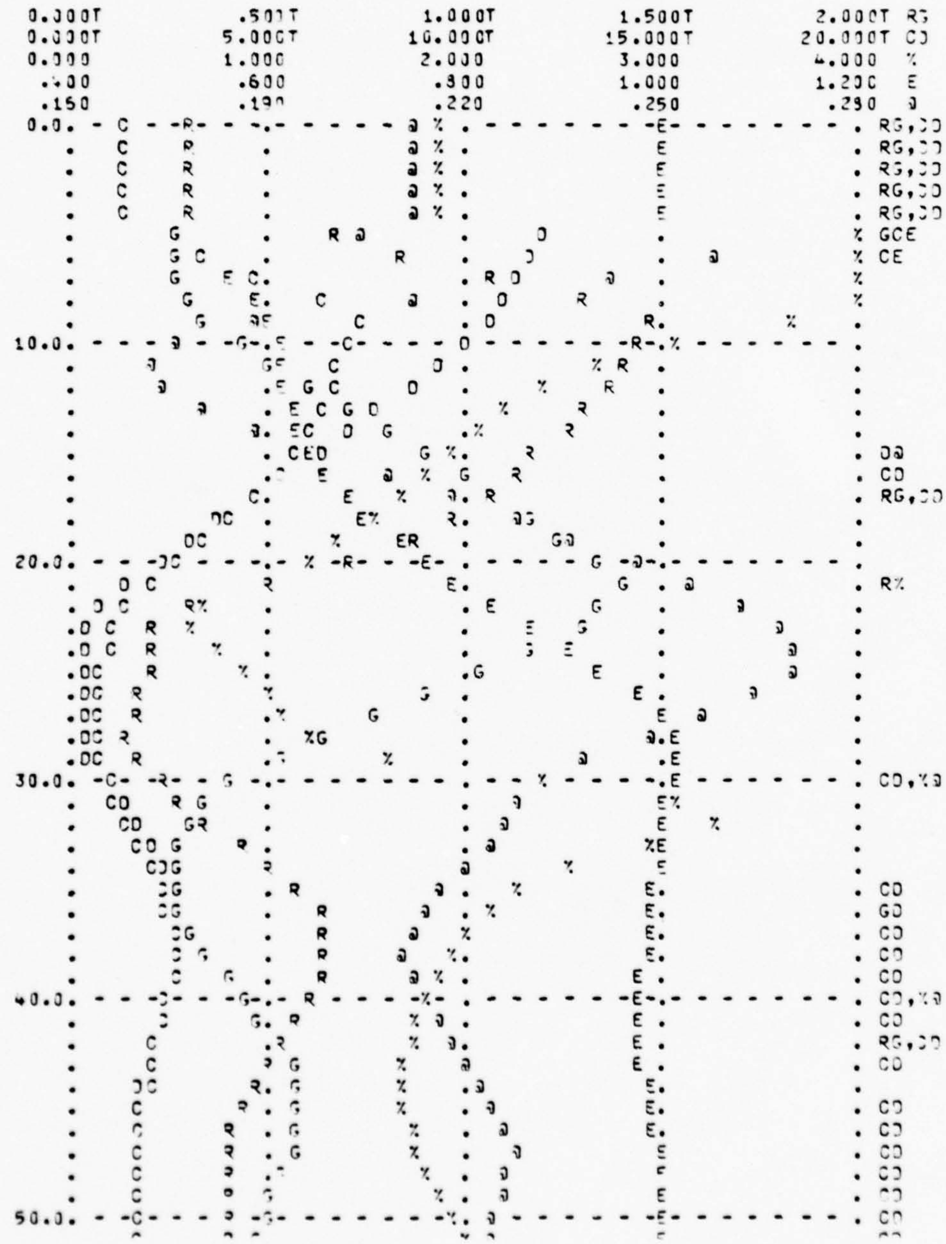

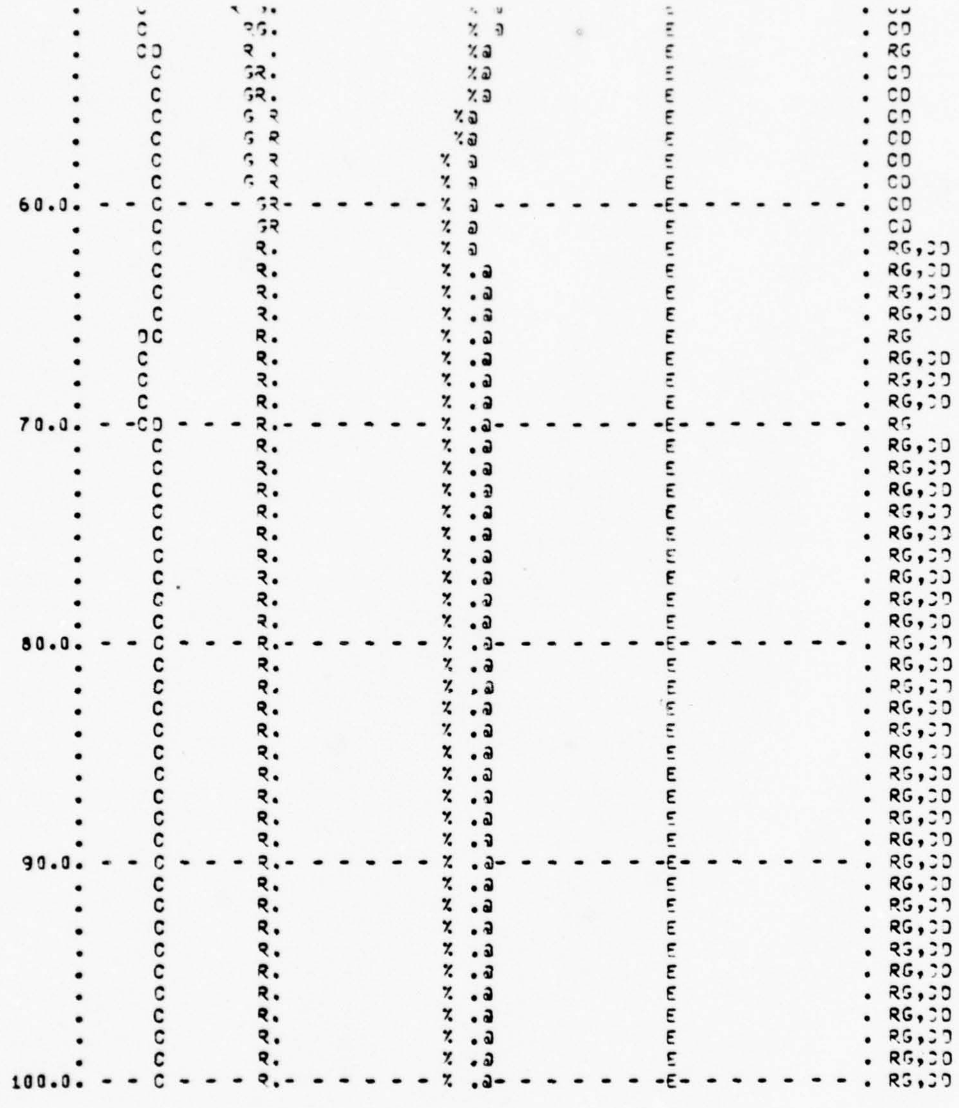

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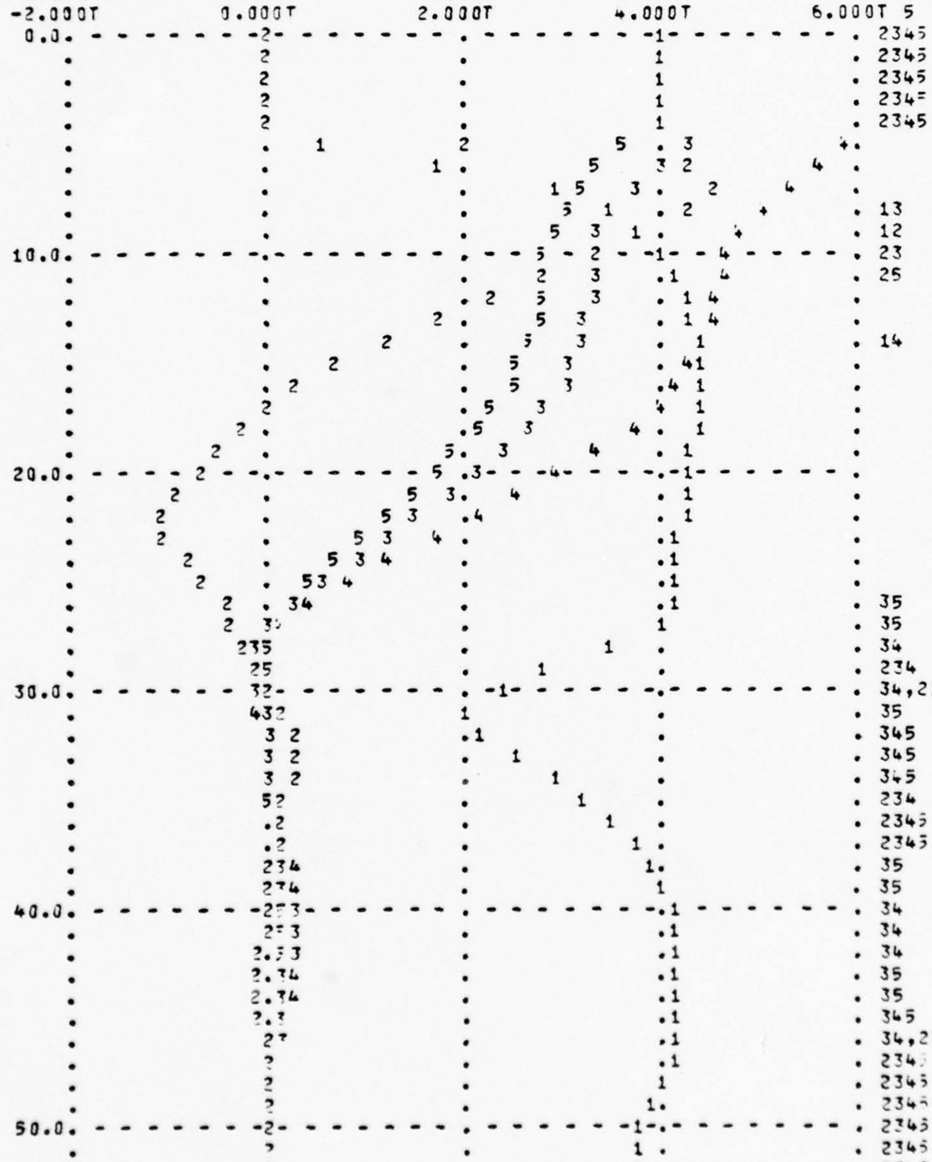

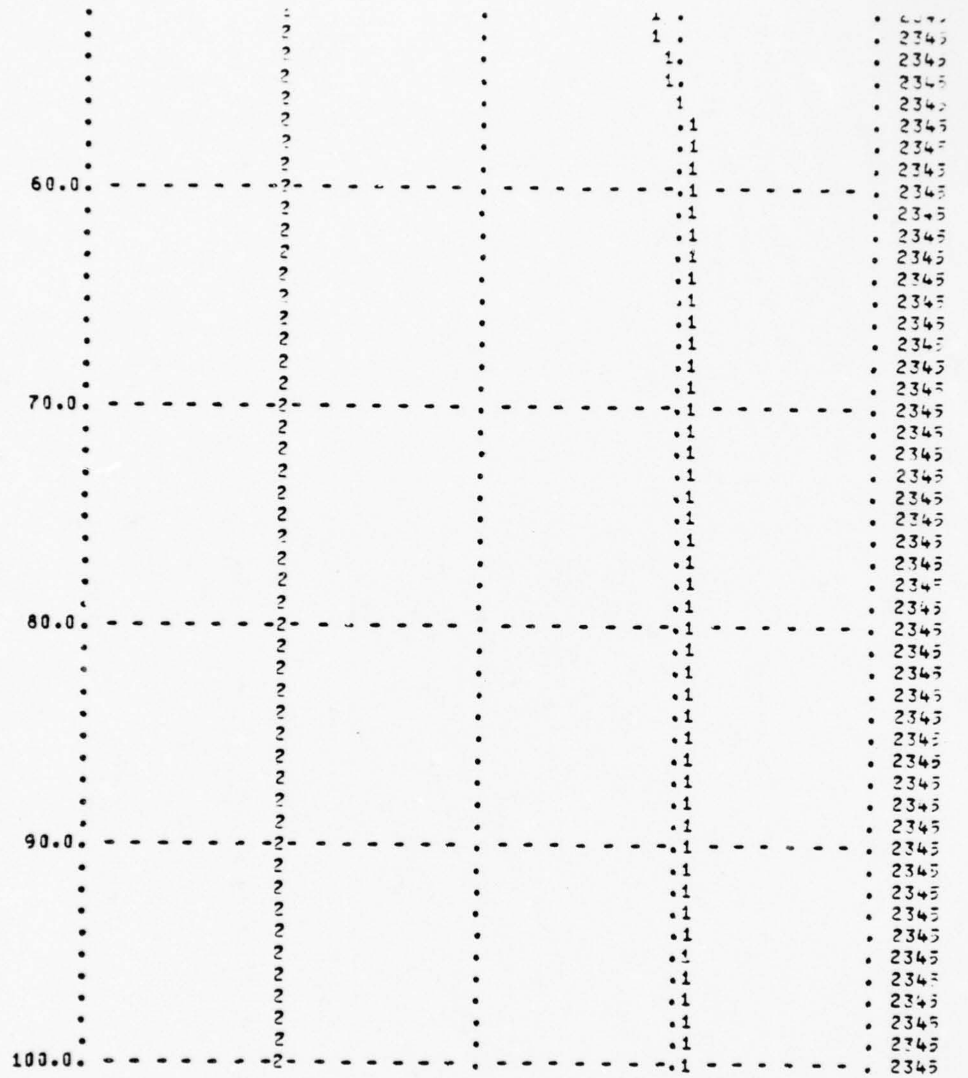
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    .           .        1   3  5  2     4  6         .
    .           .         1  .3  5 2     4  6         .
    .           .          1 . 3 5 2     4  6         .
20.0. - - - - - .- - - - -  1. -3 -2- - -4- 6 - - - - . 25
    .           .            1   3 25    4  6         .
    .           .            .1    2 5   4  6         . 23
    .           .            . 1   2 3 5 4  6         .
    .           .            .  1  2 3  54  6         .
    .           .            .   1 2   3 4  6         . 45
    .           .            .    12   3 4 56         .
    .           .            .     1     3  5         . 12,34,56
    .           .            .     21    3  5         . 34,56
    .           .            .     21   43  5         . 56
30.0. - - - - - .- - - - - - . - --21 --43  5 - - - - . 56
    .           .            .     21    3  5         . 34,56
    .           .            .     1     3  5         . 12,34,56
    .           .            .     1     3  5         . 12,34,56
    .           .            .     1     3  5         . 12,34,56
    .           .            .     1     3  5         . 12,34,56
    .           .            .     1    34 56         . 12
    .           .            .     1    34 56         . 12
    .           .            .     1    34 56         . 12
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40.0. - - - - - .- - - - - - . - --1- - 34-56 - - - - . 12
    .           .            .     1    34 56         . 12
    .           .            .     1    34 56         . 12
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    .           .            .     1     3  5         . 12,34,56
    .           .            .     1     3  5         . 12,34,56
    .           .            .     1     3  5         . 12,34,56
    .           .            .     21    3  5         . 34,56
50.0. - - - - - .- - - - - - . - --21 - -3- 5 - - - - . 34,56
    .           .            .     21    3  5         . 34,56
                                   21    3  5           34,56
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     .                   .                   .        21         3    5                 .  34,56
     .                   .                   .        1          3    5                 .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
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 60.0. - - - - - - - - - . - - - - - - - - - . - - - -1- - - - -3-  5 - - - - - - - - - .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
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 70.0. - - - - - - - - - . - - - - - - - - - . - - - -21- - - - -3-  5 - - - - - - - - - .  34,56
     .                   .                   .        21         3    5                 .  34,56
     .                   .                   .        21         3    5                 .  34,56
     .                   .                   .        21         3    5                 .  34,56
     .                   .                   .        1          3    5                 .  12,34,56
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     .                   .                   .        1          3    5                 .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
 80.0. - - - - - - - - - . - - - - - - - - - . - - - -1- - - - -3-  5 - - - - - - - - - .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
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     .                   .                   .        1          3    5                 .  12,34,56
 90.0. - - - - - - - - - . - - - - - - - - - . - - - -1- - - - -3-  5 - - - - - - - - - .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
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     .                   .                   .        1          3    5                 .  12,34,56
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     .                   .                   .        1          3    5                 .  12,34,56
     .                   .                   .        1          3    5                 .  12,34,56
100.0. - - - - - - - - - . - - - - - - - - - . - - - -1- - - - -3-  5 - - - - - - - - - .  12,34,56
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APPENDIX D

FORCE DRAW-DOWN LISTING

APPENDIX D

Force Draw-Down Listing

The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

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CHANGES FOR FERJN - 03B

ORIGINAL	JOBI	7.425T	640.000	4.375T	3.000T	3.600T
PRESENT	JOBI	437.510	995.000	8.750T	6.000T	7.200T
ORIGINAL	POLADF	0.000	0.000	3.500T	1.000T	300.000
PRESENT	POLADF	0.000	0.000	7.000T	2.000T	1.800T
ORIGINAL	POLHRS	393.000T				
PRESENT	POLHRS	786.000T				
ORIGINAL	RS11	0.000	0.000	0.000	0.000	0.000
PRESENT	RS11	0.000	0.000	-.500	-.500	-.500
ORIGINAL	RT11	0.000	0.000	4.000	4.000	4.000
PRESENT	RT11	0.000	0.000	4.000	4.000	4.000
ORIGINAL	RS12	0.000	0.000	0.000	0.000	0.000
PRESENT	RS12	0.000	0.000	.500	.500	.500
ORIGINAL	RT12	0.000	0.000	20.000	20.000	20.000
PRESENT	RT12	0.000	0.000	5.000	5.000	5.000
ORIGINAL	RS21	0.000	0.000	0.000	0.000	0.000
PRESENT	RS21	0.000	0.000	-.500	-.500	-.500
ORIGINAL	RT21	0.000	0.000	4.000	4.000	4.000
PRESENT	RT21	0.000	0.000	4.000	4.000	4.000
ORIGINAL	RS22	0.000	0.000	0.000	0.000	0.000
PRESENT	RS22	0.000	0.000	.500	.500	.500
ORIGINAL	RT22	0.000	0.000	20.000	20.000	20.000
PRESENT	RT22	0.000	0.000	5.000	5.000	5.000
ORIGINAL	RS71	0.000				
PRESENT	RS71	-10.998T				
ORIGINAL	RT71	0.000				
PRESENT	RT71	4.000				
ORIGINAL	RS72	0.000				
PRESENT	RS72	10.998T				
ORIGINAL	RT72	0.000				
PRESENT	RT72	5.000				

```
PAGE  46  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            038

  TIME      JOB     TRNG      NEED  DFORCE      ATT     WIND  DTMFOR
              2        2         2       2        2    TRINS  TOTFOR
              3        3         3       3        3      CAP  TODFOR
              4        4         4       4        4   TONEED   DSIZE
              5        5         5       5        5    FORCE  DDSIZE
           HERR    DEDSC      PATT  CRATIO   CCRATI      ATJ  AHOURS
              2        2      PREC       2        2        2       2
              3        3    TRNGFC       3        3        3       3
              4        4     FCEFC       4        4        4       4
              5        5      TDEL       5        5        5       5
          SCOST    RCOST      TRAV
          PCOST    ACOST
          TCOST   TOTCOS
          UCOST    DCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  E-00     E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-00    E-00     E-00     E-00    E-00
           E-00     E-00      E-03    E-00     E-00     E-00    E 03
           E-00     E-00      E-00    E-00     E-00     E-00    E 03
           E-00     E-00      E-00    E-00     E-00     E-00    E 03
           E 05     E 05      E-00
           E 06     E 07
           E 06     E 05
           E 05     E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  0.00    437.5     45.2    62.500   500.0     8.75   2395.5  22945.
         995.00   106.71     82.09  995.00   19.900   1.9800  30053.
         8750.0   1717.9    904.17  8750.0   175.00   1.0000  23445.
         6000.0   1364.0    620.00  6000.0   120.00   2412.8  1370.6
         7200.0   1041.5    744.00  7200.0   144.00       0.  1370.6
             0.     62.5    1870.6      0.       0.   12.000      0.
             0.     0.00    467.65      0.       0.   16.000      0.
         48.000      -.0    221.97  1.2500   1.2500   12.000  420.00
         25.000      -.0    1.0000  3.0000   3.0000   12.000  150.00
         30.000      -.0    7.0000  4.0000   4.0000   12.000  215.00
             0.     0.00    1.0000
           0.00       0.
             0.       0.
            0.0       0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

4.00	458.1	42.7	41.945	500.0	9.16	2392.1	22946.
	394.32	105.97	32.73	995.53	19.396	1.8810	30053.
	8745.2	1715.1	908.09	8750.0	174.99	1.0000	23446.
	5996.7	1362.5	622.69	6000.0	119.93	2402.5	1371.3
	7196.3	1041.7	747.07	7200.0	143.92	1.	1372.0
	0.	41.9	1971.0	0.	0.	11.993	0.
	0.	.71	467.82	0.	0.	16.000	0.
	48.025	4.3	221.67	1.2493	1.2500	12.000	420.00
	25.014	3.7	.9995	2.9964	3.0000	12.000	150.00
	30.015	3.7	7.0000	3.9979	4.0000	12.000	215.00
	721.	24.32	1.0005				
	19.14	4575.					
	2059.	3263.					
	439.6	3115.					

8.00	5202.3	4049.2	0.000	500.0	154.53	4732.3	11200.
	574.32	5.15	0.00	225.36	17.175	1.0882	23401.
	5751.6	214.1	0.00	4375.0	170.85	.9291	11700.
	4012.1	227.5	0.00	3000.0	119.18	1.0	525.5
	4571.9	59.3	0.00	3500.0	135.81	-9606.	400.0
	0.	-4702.3	2310.8	0.	0.	15.975	0.
	0.	-549.47	156.39	0.	0.	16.000	0.
	36.512	-1376.5	315.91	1.6433	1.2500	12.000	210.00
	18.693	-1312.1	1.3062	4.0121	3.0000	12.000	75.00
	23.622	-971.9	6.4758	5.0799	4.0000	12.000	105.00
	1436.	33.95	1.1145				
	45.77	11333.					
	4919.	7332.					
	886.2	5619.					

12.00	5194.7	4503.3	0.000	500.0	147.90	6040.0	11189.
	314.15	.29	0.00	212.94	8.344	1.4972	29599.
	4166.1	845.9	696.75	4375.0	118.51	.8941	11535.
	2850.4	537.4	434.76	3000.0	61.15	1699.9	470.3
	3488.8	509.5	516.65	3500.0	99.33	-8539.	400.0
	0.	-4694.7	2122.0	0.	0.	11.605	0.
	0.	-101.21	117.59	0.	0.	16.000	0.
	50.407	209.3	442.00	1.1903	1.2500	12.000	210.00
	26.312	149.3	.9572	2.8504	3.0000	12.000	75.00
	30.956	111.2	6.2565	3.3765	4.0000	12.000	105.00
	2134.	41.05	1.0515				
	92.66	15208.					
	9361.	12856.					
	1210.8	10911.					

16.00	4687.2	4045.7	0.000	500.0	133.56	5150.9	11138.
	213.40	14.33	22.90	212.77	5.332	1.8480	27755.
	4433.1	978.7	449.09	4375.0	121.15	.8789	11538.
	3027.3	813.7	317.86	3000.0	62.73	1168.0	394.3
	3638.3	553.1	376.17	3600.0	99.43	-7442.	400.0
	0.	-4387.2	1910.2	0.	0.	12.133	0.
	0.	-.53	98.59	0.	0.	16.000	0.
	47.371	-58.1	416.34	1.2566	1.2500	12.000	210.00
	24.775	-27.3	1.0113	3.0273	3.0000	12.000	75.00
	29.684	-39.3	6.1521	4.0426	4.0000	12.000	108.00
	2812.	46.53	.9624				
	135.34	20635.					
	14184.	19613.					
	1413.3	14973.					
20.00	4638.9	3704.3	0.000	500.0	122.47	4809.3	11138.
	215.76	25.96	17.90	212.77	5.535	1.8701	25535.
	4384.9	992.4	479.89	4375.0	114.53	.8807	11535.
	3016.5	593.5	321.17	3000.0	78.79	1215.7	403.5
	3605.3	553.5	396.76	3600.0	94.17	-6231.	400.0
	0.	-4199.9	1783.7	0.	0.	12.037	0.
	0.	-2.99	100.87	0.	0.	16.000	0.
	47.832	-9.3	401.75	1.2528	1.2500	12.000	210.00
	24.863	-15.5	1.0029	3.0166	3.0000	12.000	75.00
	29.956	-5.7	6.1649	4.0059	4.0000	12.000	108.00
	3465.	51.31	.9775				
	176.95	25037.					
	18500.	23866.					
	1546.9	18339.					
24.00	4398.5	3259.5	0.000	500.0	110.13	4354.5	11138.
	213.57	23.91	18.71	212.77	5.348	1.8753	25423.
	4392.5	908.7	474.19	4375.0	109.73	.8801	11539.
	3001.7	721.3	328.05	3000.0	75.16	1210.1	400.5
	3507.4	547.4	389.16	3600.0	90.32	-5117.	400.0
	0.	-3998.5	1669.1	0.	0.	12.019	0.
	0.	-.91	100.13	0.	0.	16.000	0.
	47.918	-7.7	386.39	1.2521	1.2500	12.000	210.00
	24.996	-1.7	1.0015	3.0017	3.0000	12.000	75.00
	29.939	-7.4	6.1607	4.0092	4.0000	12.000	108.00
	4090.	57.01	.9723				
	213.62	29045.					
	22553.	28635.					
	1651.9	21131.					

25.00	-124.0	2860.7	0.000	500.0	99.17	3957.7	11195.
	213.34	24.00	18.34	212.77	5.130	1.8774	24321.
	4393.0	893.5	466.29	4375.0	105.39	.8801	11536.
	3005.7	711.3	320.11	3000.0	72.30	1193.0	400.5
	3605.4	542.4	396.28	3600.0	36.70	-4092.	400.0
	0.	-3624.0	1569.1	0.	0.	12.022	0.
	0.	-.57	100.13	0.	0.	16.000	0.
	47.912	-8.0	369.57	1.2523	1.2500	12.000	210.00
	24.944	-6.7	1.0018	3.0067	3.0000	12.000	75.00
	29.955	-5.4	6.1607	4.0060	4.0000	12.000	108.00
	4687.	62.23	.9720				
	246.93	32851.					
	26337.	33115.					
	1748.7	23445.					
32.00	3852.4	2492.7	0.000	500.0	89.09	3589.2	11156.
	213.12	23.71	18.19	212.77	4.328	1.8793	23290.
	4381.2	987.1	465.13	4375.0	101.31	.8801	11535.
	3004.3	704.0	318.69	3000.0	59.47	1195.1	400.3
	3604.9	537.7	382.89	3600.0	83.36	-3147.	400.0
	0.	-3352.4	1478.8	0.	0.	12.017	0.
	0.	-.37	100.08	0.	0.	16.000	0.
	47.932	-6.2	353.53	1.2518	1.2500	12.000	210.00
	24.964	-4.3	1.0014	3.0043	3.0000	12.000	75.00
	29.959	-4.2	6.1604	4.0054	4.0000	12.000	108.00
	5259.	67.47	.9720				
	277.14	35444.					
	29673.	37162.					
	1943.5	25362.					
36.00	3587.5	2157.0	0.000	500.0	79.88	3252.6	11138.
	213.05	23.43	18.01	212.77	4.744	1.8787	22335.
	4380.9	879.7	461.18	4375.0	97.55	.8801	11539.
	3004.2	698.7	316.10	3000.0	56.89	1175.1	400.3
	3604.4	533.7	379.85	3600.0	80.26	-2274.	400.0
	0.	-3087.5	1396.2	0.	0.	12.016	0.
	0.	-.23	100.07	0.	0.	16.000	0.
	47.935	-5.3	337.80	1.2517	1.2500	12.000	210.00
	24.955	-4.2	1.0013	3.0042	3.0000	12.000	75.00
	29.953	-4.4	6.1604	4.0049	4.0000	12.000	108.00
	5805.	72.65	.9719				
	304.53	39839.					
	32708.	40869.					
	1937.7	26950.					

40.00	4909.9	1177.3	0.000	2530.2	105.01	2006.3	11138.
	213.02	23.25	17.83	212.77	4.556	1.8769	21403.
	4330.5	972.9	457.04	4375.0	93.59	.8800	13738.
	3004.1	693.0	313.57	3000.0	54.25	1165.7	400.2
	3604.3	529.1	376.78	3600.0	77.08	-1388.	400.0
	0.	-2329.7	1356.0	0.	0.	12.015	0.
	0.	-.23	100.06	0.	0.	16.000	0.
	47.938	-5.3	247.44	1.2516	1.2500	12.000	210.00
	24.966	-4.1	1.0013	3.0041	3.0000	12.000	75.00
	29.964	-4.7	6.1603	4.0047	4.0000	12.000	103.00
	6332.	77.85	.8405				
	325.61	43149.					
	35322.	44134.					
	2031.8	28213.					
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
44.00	4874.1	433.4	0.000	3364.1	99.59	1657.0	11359.
	255.36	101.62	143.69	384.01	5.218	3.0282	20442.
	4381.2	964.5	453.01	4375.0	99.52	.9547	14743.
	3004.5	585.5	310.46	3000.0	51.39	1280.3	773.3
	3604.6	524.1	373.14	3600.0	73.65	-433.	922.1
	0.	-1490.0	1354.6	0.	0.	11.980	0.
	0.	128.65	193.32	0.	0.	16.000	0.
	47.932	-5.2	211.44	1.2518	1.2500	12.000	210.00
	24.953	-4.5	1.0014	3.0045	3.0000	12.000	75.00
	29.952	-4.5	6.6826	4.0051	4.0000	12.000	103.00
	6834.	84.32	.9654				
	340.34	45552.					
	37016.	46446.					
	2124.1	29031.					
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
48.00	3945.8	275.7	0.000	3362.1	78.38	1504.2	11693.
	659.17	170.53	103.57	717.98	13.093	2.1196	13502.
	4379.5	958.1	450.66	4375.0	85.39	1.0000	15055.
	3003.4	581.7	308.98	3000.0	59.56	1234.2	1397.2
	3603.5	527.7	371.09	3600.0	71.58	135.	1435.0
	0.	-583.7	1299.7	0.	0.	11.951	0.
	0.	59.32	349.29	0.	0.	16.000	0.
	47.949	-4.5	204.59	1.2513	1.2500	12.000	210.00
	24.972	-3.4	1.0010	3.0034	3.0000	12.000	75.00
	29.971	-3.7	7.0000	4.0039	4.0000	12.000	103.00
	7314.	98.45	.9745				
	353.55	49746.					
	38410.	48431.					
	2225.1	29667.					

52.00	3460.5	393.2	0.000	3412.1	58.75	1491.9	11728.
	778.25	71.32	37.58	753.13	15.462	1.8049	13142.
	4376.4	855.0	451.74	4375.0	35.35	1.0000	15140.
	3001.0	631.7	309.49	3000.0	59.62	1159.8	1434.7
	3601.2	513.7	371.79	3600.0	71.54	128.	1375.2
	0.	-43.4	1248.0	0.	0.	12.029	0.
	0.	-25.03	351.17	0.	0.	15.000	0.
	47.984	-1.-	205.05	1.2504	1.2500	12.000	210.00
	24.992	-1.0	1.0003	3.0010	3.0000	12.000	75.00
	29.990	-1.2	7.0000	4.0013	4.0000	12.000	103.00
	7779.	117.72	1.0007				
	365.44	52801.					
	39705.	50421.					
	2401.0	30232.					
56.00	3414.3	371.3	0.000	3438.9	58.31	1542.6	11617.
	674.07	34.65	26.25	642.05	13.326	1.7609	13072.
	4374.5	853.0	452.62	4375.0	37.78	1.0000	15055.
	2999.5	637.0	310.43	3000.0	60.19	1151.6	1185.9
	3599.7	520.3	372.33	3600.0	72.23	-53.	1159.7
	0.	24.5	1222.4	0.	0.	12.032	0.
	0.	-32.02	296.74	0.	0.	16.000	0.
	48.006	.7	210.23	1.2499	1.2500	12.000	210.00
	25.003	.4	.9999	2.9996	3.0000	12.000	75.00
	30.002	.7	7.0000	3.9997	4.0000	12.000	103.00
	5237.	134.19	1.0064				
	377.58	55321.					
	41002.	52472.					
	2666.2	30765.					
60.00	3502.4	382.1	0.000	3438.3	70.45	1562.8	11563.
	589.54	53.57	48.76	583.45	11.361	1.8704	13129.
	4374.7	860.1	452.71	4375.0	39.00	1.0000	15002.
	2999.7	683.0	310.45	3000.0	60.34	1184.4	1102.8
	3599.8	521.7	372.49	3600.0	72.41	-110.	1105.2
	0.	-63.5	1215.3	0.	0.	12.000	0.
	0.	-1.13	275.71	0.	0.	15.000	0.
	48.004	.7	212.40	1.2499	1.2500	12.000	210.00
	25.002	.7	.9999	2.9997	3.0000	12.000	75.00
	30.002	.2	7.0000	3.9997	4.0000	12.000	103.00
	8695.	148.39	1.0026				
	390.03	58848.					
	42332.	54539.					
	2964.2	31253.					

76.00	3418.6	355.5	0.000	3426.2	58.39	1541.5	11615.
	644.03	64.77	49.46	640.00	12.385	1.8645	13051.
	4374.9	859.0	452.15	4375.0	37.53	1.0000	15041.
	2999.9	683.1	310.05	3000.0	60.02	1183.7	1200.8
	3599.9	520.9	372.04	3600.0	72.02	-6.	1197.3
	0.	7.7	1203.6	0.	0.	12.004	0.
	0.	-4.07	300.20	0.	0.	16.000	0.
	48.001	.1	211.11	1.2500	1.2500	12.000	210.00
	25.001	.1	1.0000	2.9999	3.0000	12.000	75.00
	30.001	.1	7.0000	3.9999	4.0000	12.000	108.00
	10528.	210.91	1.0009				
	439.42	70997.					
	47645.	52979.					
	4082.1	32619.					

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80.00	3433.2	357.7	0.000	3427.0	58.71	1543.6	11508.
	633.50	66.71	52.33	633.39	12.679	1.8791	13072.
	4374.9	859.1	452.16	4375.0	37.56	1.0000	15035.
	3000.0	682.1	310.06	3000.0	60.04	1186.6	1190.4
	3600.0	520.9	372.06	3600.0	72.05	-13.	1190.7
	0.	-6.2	1203.8	0.	0.	12.000	0.
	0.	-.11	297.60	0.	0.	16.000	0.
	48.001	.1	211.31	1.2500	1.2500	12.000	210.00
	25.000	.0	1.0000	3.0000	3.0000	12.000	75.00
	30.000	.0	7.0000	3.9999	4.0000	12.000	108.00
	10985.	226.47	1.0003				
	451.76	73917.					
	48972.	55078.					
	4367.4	33108.					

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84.00	3434.5	354.4	0.000	3425.4	58.70	1541.8	11512.
	635.29	69.87	54.12	637.09	12.708	1.8868	13073.
	4375.0	853.0	452.09	4375.0	37.52	1.0000	15037.
	3000.0	682.1	310.00	3000.0	60.01	1188.2	1193.7
	3600.0	520.9	372.01	3600.0	72.01	-4.	1200.4
	0.	-9.1	1203.9	0.	0.	11.998	0.
	0.	1.31	299.67	0.	0.	16.000	0.
	48.000	-.0	211.19	1.2500	1.2500	12.000	210.00
	25.000	-.0	1.0000	3.0000	3.0000	12.000	75.00
	30.000	-.0	7.0000	4.0000	4.0000	12.000	108.00
	11444.	241.97	.9997				
	464.11	76327.					
	50299.	67177.					
	4650.7	33379.					

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88.00	3427.1	352.5	0.000	3424.4	68.53	1540.1	11517.
	640.35	69.97	53.16	641.66	12.315	1.8833	13057.
	4375.0	853.9	452.05	4375.0	87.48	1.0000	15041.
	3000.0	682.0	309.98	3000.0	59.39	1187.6	1205.9
	3600.0	520.5	371.98	3600.0	71.99	4.	1207.5
	0.	-2.7	1203.6	0.	0.	11.999	0.
	0.	.81	301.72	0.	0.	16.000	0.
	47.999	-.0	211.06	1.2500	1.2500	12.000	210.00
	25.000	-.0	1.0000	3.0000	3.0000	12.000	75.00
	30.000	-.0	7.0000	4.0000	4.0000	12.000	108.00
	11901.	257.53	.9997				
	476.43	79935.					
	51625.	69272.					
	4932.3	37623.					
92.00	3422.8	353.7	0.000	3424.8	68.45	1540.1	11517.
	642.38	58.65	52.52	641.91	12.346	1.8783	13054.
	4375.0	858.9	452.07	4375.0	87.49	1.0000	15042.
	3000.0	632.0	309.99	3000.0	59.99	1185.6	1205.6
	3600.0	520.8	371.99	3600.0	71.99	3.	1205.1
	0.	2.7	1203.3	0.	0.	12.001	0.
	0.	-.47	301.65	0.	0.	16.000	0.
	43.000	-.0	211.06	1.2500	1.2500	12.000	210.00
	25.000	-.0	1.0000	3.0000	3.0000	12.000	75.00
	30.000	-.0	7.0000	4.0000	4.0000	12.000	108.00
	12359.	273.28	1.0000				
	488.75	32947.					
	52949.	71367.					
	5214.1	33844.					
96.00	3424.0	354.3	0.000	3425.4	68.48	1540.9	11515.
	640.53	68.05	52.35	639.99	12.311	1.8779	13054.
	4375.0	853.0	452.09	4375.0	87.50	1.0000	15040.
	3000.0	682.0	310.01	3000.0	60.00	1186.5	1202.9
	3600.0	521.5	372.00	3600.0	72.00	-1.	1202.4
	0.	1.4	1203.2	0.	0.	12.001	0.
	0.	-.53	300.71	0.	0.	16.000	0.
	48.000	.0	211.13	1.2500	1.2500	12.000	210.00
	25.000	.0	1.0000	3.0000	3.0000	12.000	75.00
	30.000	.0	7.0000	4.0000	4.0000	12.000	108.00
	12816.	238.37	1.0001				
	501.08	33951.					
	54274.	73464.					
	5497.0	34047.					

100.00	3426.1	374.[illegible]	0.000	3425.5	55.53	1541.2	11514.
	639.12	59.[illegible]	52.75	639.12	12.764	1.8799	13766.
	4375.0	383.[illegible]	452.09	4375.0	37.51	1.0000	15040.
	3000.0	547.[illegible]	310.01	3000.0	60.01	1186.9	1201.5
	3600.0	570.[illegible]	372.01	3600.0	72.01	-2.	1201.6
	0.	-.[illegible]	1203.2	0.	0.	12.000	0.
	0.	-.00	300.37	0.	0.	16.000	0.
	48.000	[illegible]	211.15	1.2500	1.2500	12.000	210.00
	25.000	.[illegible]	1.0000	3.0000	3.0000	12.000	75.00
	30.000	.0	7.0000	4.0000	4.0000	12.000	105.00
	13274.	304.5[illegible]	1.0000				
	513.41	88953.					
	55593.	75550.					
	5780.1	34226.					

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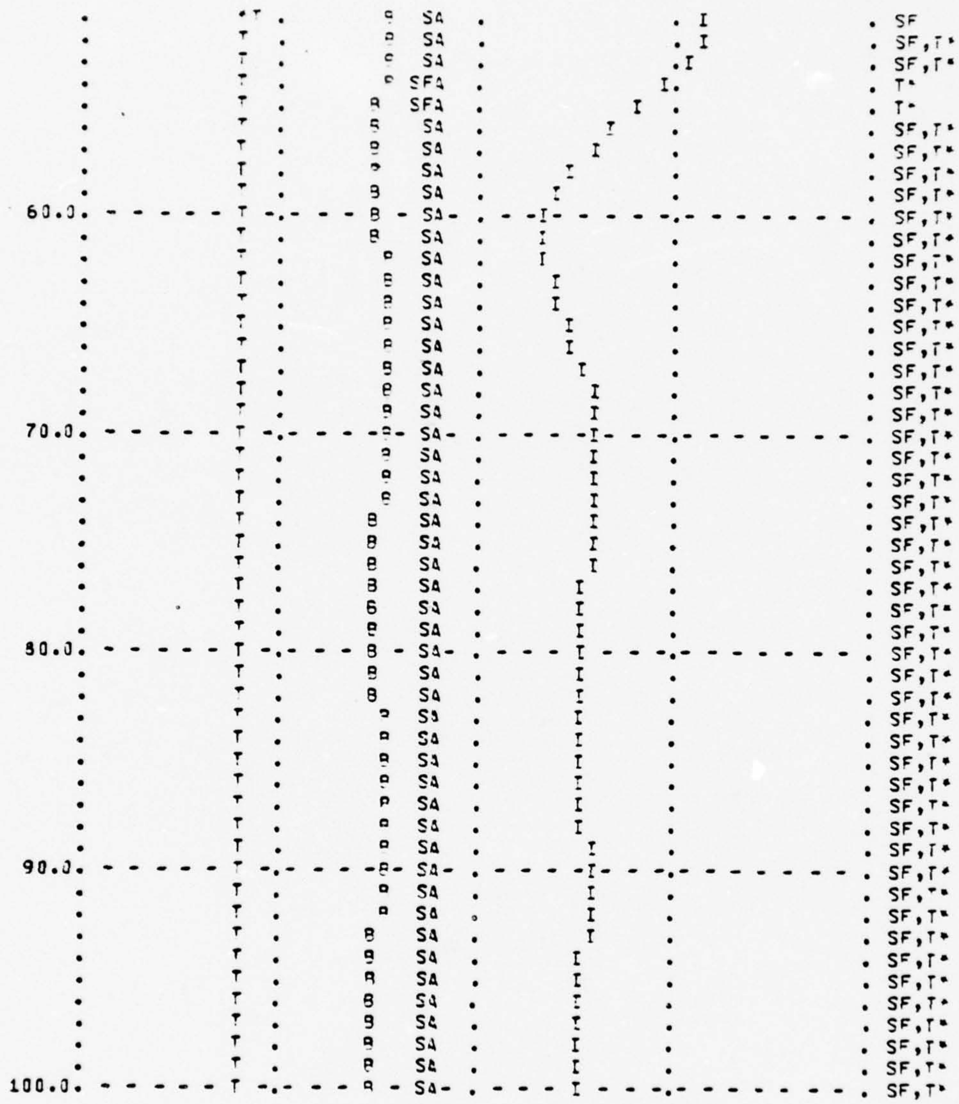
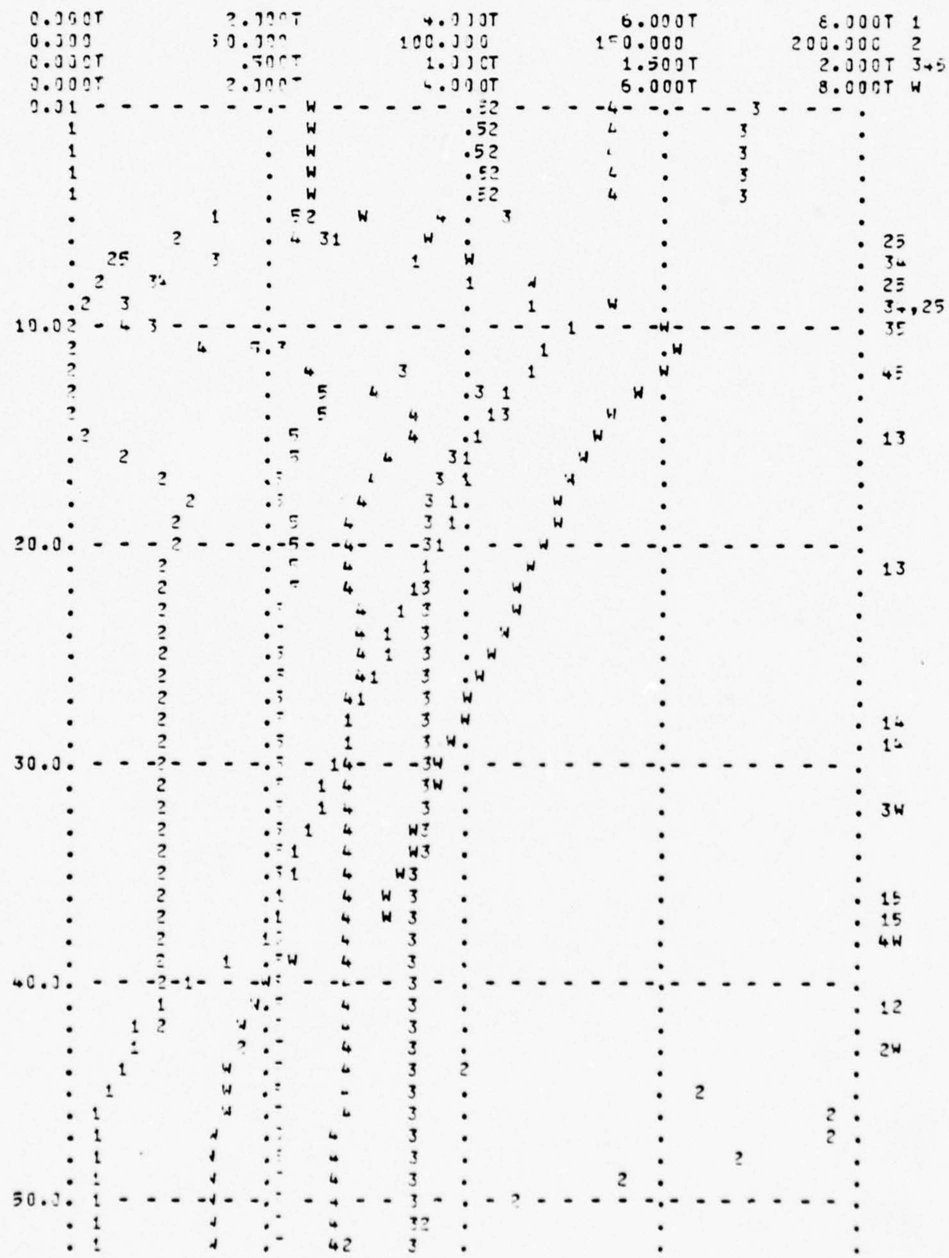
PAGE  36  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL             D33

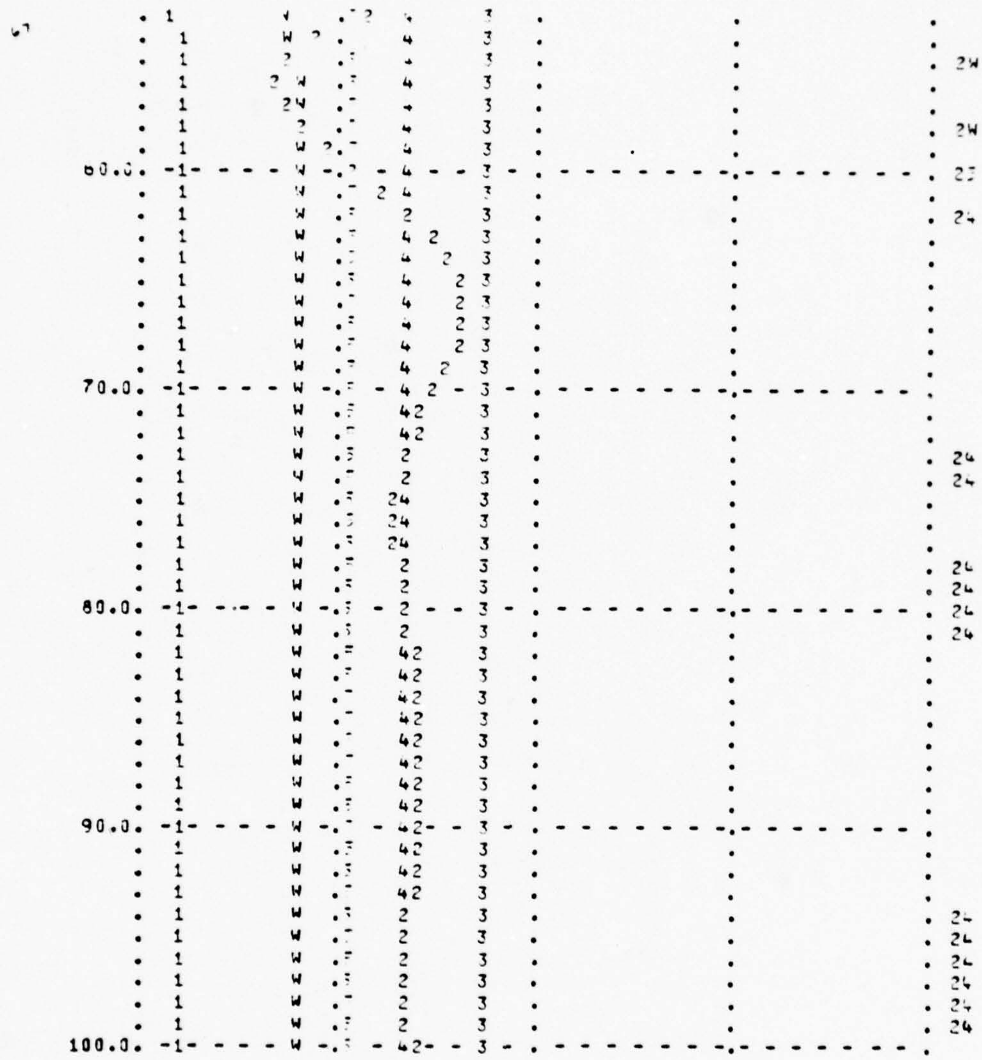
  JOB(1)=S  JOB(2)=I  JOB(3)=F  JOB(4)=B  JOB(5)=A  TOTFOR=T
  FORSIZ=*

  0.000T              2.000T              4.000T              6.000T              8.000T S
  0.000T               .250T               .500T               .750T              1.000T I
  0.000T              2.500T              5.000T              7.500T             10.000T F
  0.000T              2.000T              4.000T              6.000T              8.000T BA
 15.000T             20.000T             25.000T             30.000T             35.000T T*
     0.0. -S- - - - - -.- - - - - - - - - . - - - - - - - - -B- - - -FA - - I BT*
        .   S               .                   .                  B         F A        I BT*
        .   S               .                   .                  B         F A        I BT*
        .   S               .                   .                  B         F A        I BT*
        .   S               .                   .                  B         F A        I BT*
        .          S    *   .                   .                B T       FA        I  .
        .               *   .       S           .          B       FA     I             . FT
        .               *   .                   .   SB      F   I T.                    . FA
        .               *   .                   B    IF     S    T  .                   . IA
        .               *   .               B IAF              ST  .                   .
    10.0. - - - - - - * -.- - - - BI-AF . - - - - - - S -.- - - - - - - - - . ST
        .               *   .       IB      F   .             ST    .                   . FA
        .               *   .    I  B    FA     .           S T     .                   .
        .               *   .  I    B    F  A   .          S T      .                   .
        .               *   I        B     FA   .        S   T      .                   .
        .               *  I.        B     FA   .        S  T       .                   .
        .               *I  .          F    F   .        ST         .                   . FA
        .               *I  .          B    F   .       ST          .                   . FA
        .               *I  .          B    F   .       ST          .                   . FA
        .               *I  .          B   FA   .       S           .                   . ST
    20.0. - - - - - - *I-.- - - -B- FA- . - -S- - - - - -.- - - - - - - - - . ST
        .               *I  .          B   FA   .    TS             .                   .
        .               *I  .          B   FA   .   TS              .                   .
        .               *I  .        B     FA   . T  S              .                   .
        .               *I  .          B   FA   .T S                .                   .
        .               *I  .          B   FA   T S                 .                   .
        .               *I  .          B   FA   T S                 .                   .
        .               *I  .          B   FA T.S                   .                   .
        .               *I  .          B   FAT .S                   .                   .
        .               *I  .          B   FA   S                   .                   . AT
    30.0. - - - - - - *I-.- - - -B- FA- S - - - - - - - - -.- - - - - - - - - . FT
        .               *I  .          B   FA S.                    .                   . FT
        .               *I  .          B TFA S.                     .                   .
        .               *I  .          BT FAS .                     .                   .
        .               *I  .          B  FAS .                     .                   . BT
        .               *I  .          B  FS  .                     .                   . SA,BT
        .               *I  .        TB   FS  .                     .                   . SA
        .               *I  .       T  B  SA  .                     .                   . SF
        .               *I  .       T  B  FAS .                     .                   .
        .               *I  .      T   B  FA  .   S                 .                   .
    40.0. - - - - - - *I-.- -T- -B- FA- . - - -S- - - -.- - - - - - - - - .
        .               *I  .   T      B  FA  .          S          .                   .
        .               *I  .   T      B  FA  .          S          .                   .
        .               *I  .  -       B  FA  .          S          .                   .
        .               *   IT         B  FA  .         S           .                   .
        .               *   .-    I    B  FA  .      S              .                   .
        .               *    T         -  FI  .   S                 .                   . IA
        .               *  T.          B  FA  .S  I                 .                   .
        .               *  T.          B  FA  S            I        .                   .
        .               *-  .          B  FAS .                  I.                     .
    50.0. - - - - - - *T-.- - - -B- FS- . - - - - - - - - -.I - - - - - - - . SA
```


60.0
70.0
80.0
90.0
100.0

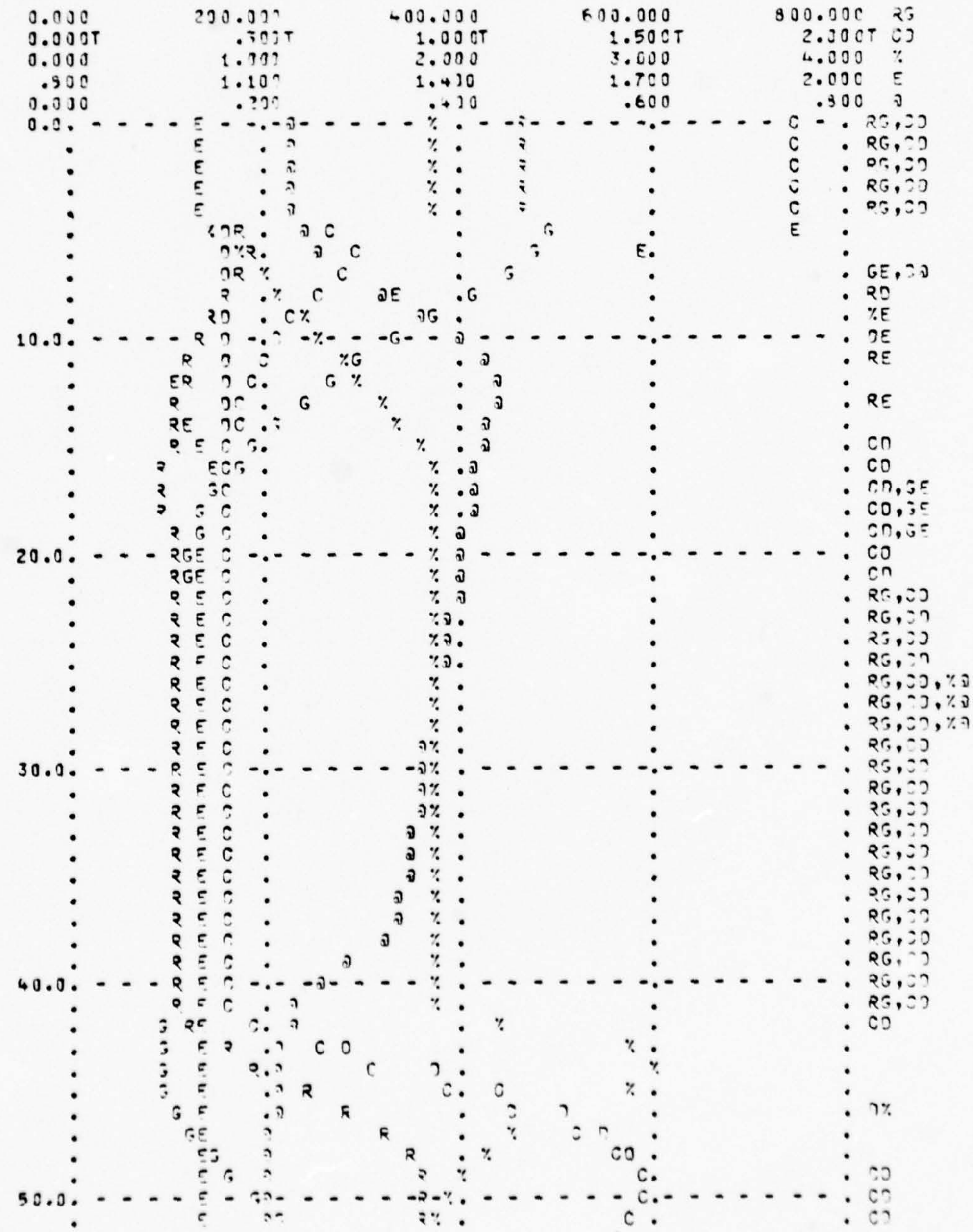
TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W

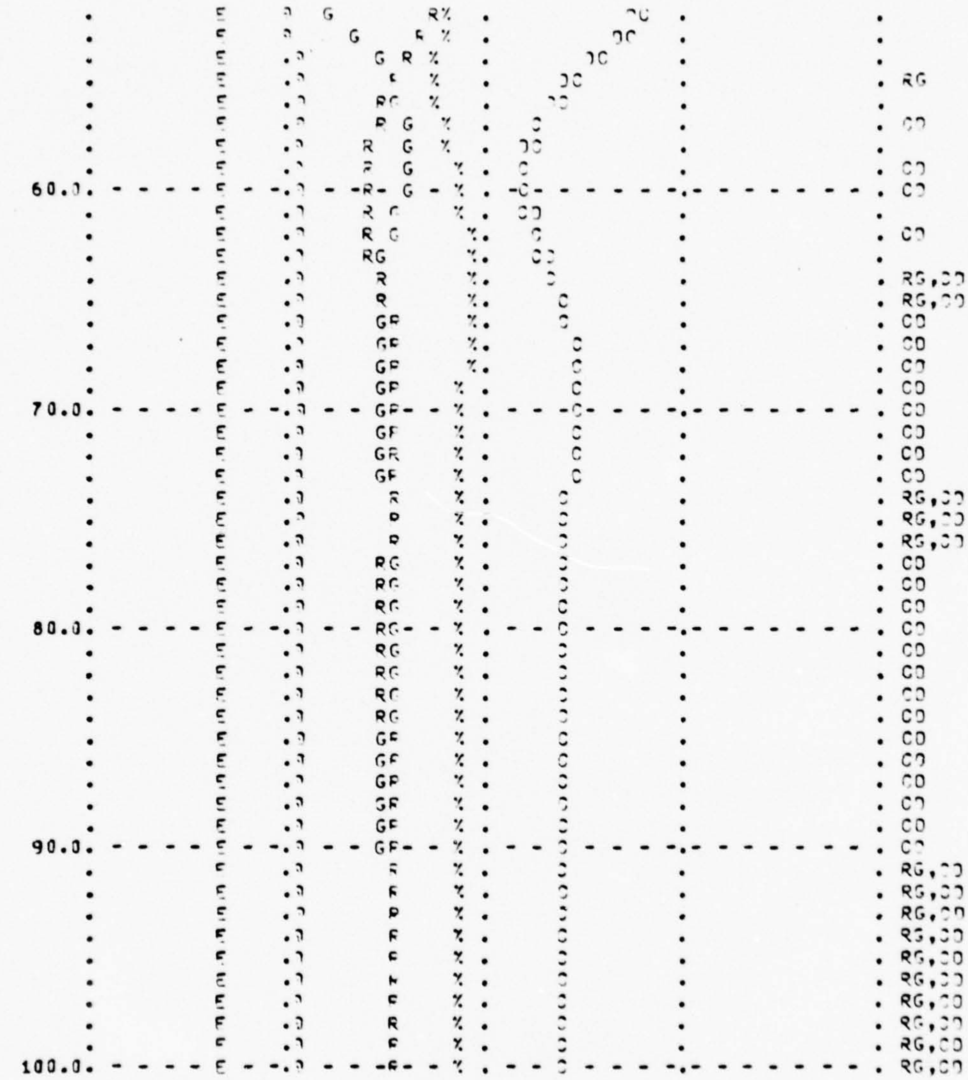



60.0
70.0
80.0
90.0
100.0

PAGE 58 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL C33

PREC=R UPT=G CSIZE=C OCSIZE=O TRINS=% FOSFC=E TRNSFC=@




60.0
70.0
80.0
90.0
100.0

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70
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      .                  .   15 3     .                  .                  . 12,34,56
      .                  .   15 3     .                  .                  . 12,34,56
      .                  .   15 3     .                  .                  . 12,34,56
      .                  .   15 3     .                  .                  . 12,34,56
      .                  .   15 3     .                  .                  . 12,34,56
 60.0 . - - - - - - - -.- -15 3 - - - . - - - - - - - -.- - - - - - - - . 12,34,56
      .                  .   15 3     .                  .                  . 12,34,56
      .                  .   15 43    .                  .                  . 12,56
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 70.0 . - - - - - - - -.- -15 43- - - . - - - - - - - -.- - - - - - - - . 12,56
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      .                  .   15 3     .                  .                  . 12,34,56
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      .                  .   15 3     .                  .                  . 12,34,56
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 90.0 . - - - - - - - -.- -15 43- - - . - - - - - - - -.- - - - - - - - . 12,56
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      .                  .   15 3     .                  .                  . 12,34,56
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      .                  .   15 3     .                  .                  . 12,34,56
      .                  .   15 3     .                  .                  . 12,34,56
100.0 . - - - - - - - -.- -15 3 - - - . - - - - - - - -.- - - - - - - - . 12,34,56
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PAGE 59 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL   C3R

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CRATIO(3)=1  DCRATI(3)=2  CRATIO(4)=3  DCRATI(4)=4  CRATIO(5)=5
DCRATI(5)=6

 0.000            1.000           2.000           3.000           4.000  12
 0.000            2.000           4.000           6.000           8.000  34
 2.000            3.500           5.000           6.500           8.000  56
 0.0. - - - - - - - -.- -15 43- - - . - - - - - - - -.- - - - - - - - . 12,56
    .                .  15 3        .                .                . 12,34,56
    .                .  15 3        .                .                . 12,34,56
    .                .  15 3        .                .                . 12,34,56
    .                .  15 3        .                .                . 12,34,56
    .                .  26 4        .     1      3   .            5   .
    .                .  26 4        . 1      3       .5               .
    .                .  26 4      1 .    3   5       .                .
    .                .  26 4  1     35               .                .
    .                .  26 1  5 3   .                .                . 14
10.0. - - - - - - - -.- -2154 3 - - . - - - - - - - -.- - - - - - - - . 16
    .                . 126 3        .                .                . 34,25
    .                . 12634        .                .                . 25
    .                . 12534        .                .                . 56
    .                . 125 3        .                .                . 34,56
    .                .  15 3        .                .                . 12,34,56
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    .                .  15 3        .                .                . 12,34,56
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    .                .  15 43       .                .                . 12,56
    .                .  15 43       .                .                . 12,56
    .                .  15 43       .                .                . 12,56
30.0. - - - - - - - -.- -15 43- - - . - - - - - - - -.- - - - - - - - . 12,56
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    .                .  15 43       .                .                . 12,56
    .                .  15 43       .                .                . 12,56
40.0. - - - - - - - -.- -15 43- - - . - - - - - - - -.- - - - - - - - . 12,56
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    .                .  15 43       .                .                . 12,56
    .                .  15 43       .                .                . 12,56
50.0. - - - - - - - -.- -15 43- - - . - - - - - - - -.- - - - - - - - . 12,56
    .                .  15 43       .                .                . 12,56
    .                .  15 43       .                .                . 12,56
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APPENDIX E

LARGE FORCE EQUILIBRIUM LISTING

APPENDIX E

Large Force Equilibrium Listing

The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

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PAGE 16 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

E--

EQUILIBRIUM - 30003
CHANGES FOR PEPIN - LFE

ORIGINAL	LENGTH	100.000				
PRESENT	LENGTH	150.000				
ORIGINAL	JOBI	3.425T	640.000	4.375T	3.000T	3.600T
PRESENT	JOBI	437.500	995.000	8.750T	6.000T	7.200T
ORIGINAL	POLACF	0.000	0.000	3.500T	1.000T	300.000
PRESENT	POLACF	0.000	0.000	7.000T	2.000T	1.300T
ORIGINAL	POLHRS	393.000T				
PRESENT	POLHRS	786.000T				

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PAGE  17  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL              LFE

 TIME       JOB      TRNG      NEED  DFORCE      ATT     WIND  DTMFOR
              2         2         2       2        2    TPINS  TOTFOR
              3         3         3       3        3      CAP  TODFOR
              4         4         4       4        4   TONEED   DSIZE
              5         5         5       5        5    FORCE  DDSIZE
           HEPP     DPOST      PATT  CRATIO  DCRATI       ATJ  AHOURS
              2         2      PREC       2        2        2       2
              3         3    TRNGFC       3        3        3       3
              4         4     FOEFC       4        4        4       4
              5         5      TOEL       5        5        5       5
          SCOST     RCOST      TRAV
          PCOST     ACOST
          TCOST    TOTCOS
          UCOST     DCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 E-00      E-00      E-00      E-00    E-00     E-00     E-00    E-00
           E-00      E-00      E-00    E-00     E-00     E-00    E-00
           E-00      E-00      E-00    E-00     E-00     E-00    E-00
           E-00      E-00      E-00    E-00     E-00     E-00    E-00
           E-00      E-00      E-00    E-00     E-00     E-00    E-00
           E-00      E-00      E-00    E-00     E-00     E-00    E-00
           E-00      E-03      E-00    E-00     E-00     E-00    E-00
           E-00      E-00      E-03    E-00     E-00     E-00    E 03
           E-00      E-00      E-00    E-00     E-00     E-00    E 03
           E-00      E-00      E-00    E-00     E-00     E-00    E 03
           E 06      E 05      E-00
           E 05      E 05
           E 06      E 07
           E 06      E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 0.00    437.50    45.209    62.500  500.00   3.7500   2335.5  22345.
         995.00    106.71    82.087  995.00   19.300   1.8800  30053.
         8750.0    1717.3    904.17  8750.0   175.00   1.0000  23445.
         6000.0    1364.0    620.00  6000.0   120.00   2412.8  1370.6
         7200.0    1041.5    744.00  7200.0   144.00   0.0000  1370.6
             0.    52.500    1370.6      0.       0.   12.000      0.
             0.      0.00    467.65      0.       0.   16.000      0.
         48.000    -.0000    221.97  1.2500   1.2500   12.000  420.00
         25.000    -.1000    1.0000  3.0000   3.0000   12.000  150.00
         30.000    -.0000    7.0000  4.0000   4.0000   12.000  215.00
             0.      0.00    1.0000
           0.00      0.00
             0.      0.00
             0.        0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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4.00	459.05	42.207	41.945	500.00	9.1509	2392.1	22945.
	994.52	105.37	82.733	995.53	19.396	1.8810	30053.
	8745.2	1715.7	908.09	8750.0	174.90	1.0000	23445.
	5996.7	1352.3	622.49	6000.0	119.33	2402.5	1371.3
	7196.3	1041.2	747.07	7200.0	143.92	.9653	1372.0
	0.	41.947	1971.0	0.	0.	11.993	0.
	0.	305.3	467.82	0.	0.	16.000	0.
	48.025	4.7576	221.67	1.2493	1.2500	12.000	420.00
	25.014	3.253	.9995	2.9984	3.0000	12.000	150.00
	30.015	3.7359	7.0000	3.9979	4.0000	12.000	215.00
	721.	24.37	1.0005				
	19.14	4.59					
	2053.	3.27					
	440.	3115.					
8.00	455.88	44.13	44.117	500.00	9.1173	2391.9	22345.
	995.50	106.73	82.496	995.91	19.309	1.8804	30052.
	8745.6	1715.7	907.72	8750.0	174.91	1.0000	23445.
	5997.0	1352.7	622.45	6000.0	119.33	2403.8	1372.0
	7196.3	1041.1	746.99	7200.0	143.92	1.2202	1372.3
	0.	44.117	1871.1	0.	0.	11.994	0.
	0.	401.14	467.99	0.	0.	16.000	0.
	48.024	4.354	221.68	1.2494	1.2500	12.000	420.00
	25.013	3.1067	.9995	2.9985	3.0000	12.000	150.00
	30.015	3.6573	7.0000	3.9980	4.0000	12.000	216.00
	1443.	48.57	.9999				
	39.28	9.73					
	4115.	6.53					
	879.	5932.					
12.00	455.98	43.772	44.016	500.00	9.1195	2392.0	22945.
	995.41	106.57	82.415	995.73	19.308	1.8802	30052.
	8745.5	1715.3	907.82	8750.0	174.91	1.0000	23445.
	5996.9	1352.7	622.49	6000.0	119.34	2403.7	1371.5
	7196.3	1041.7	746.98	7200.0	143.92	.6899	1371.8
	0.	44.317	1871.1	0.	0.	11.994	0.
	0.	313.93	467.98	0.	0.	16.000	0.
	48.025	4.4355	221.69	1.2494	1.2500	12.000	420.00
	25.013	3.0577	.9995	2.9985	3.0000	12.000	150.00
	30.015	3.6663	7.0000	3.9960	4.0000	12.000	216.00
	2164.	72.96	1.0000				
	57.41	14.07					
	6173.	9.83					
	1319.	8430.					

16.00	456.00	43.797	43.999	500.00	9.1199	2392.1	22345.
	995.13	106.67	82.420	995.47	19.902	1.8802	30053.
	8745.7	1715.7	907.69	8750.0	174.91	1.0000	23445.
	5997.0	1362.3	622.42	6000.0	119.94	2403.4	1371.1
	7196.4	1040.7	746.90	7200.0	143.93	.2349	1371.4
	0.	43.399	1871.2	0.	0.	11.994	0.
	0.	340.19	467.77	0.	0.	16.000	0.
	48.024	4.3325	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9797	.9995	2.9985	3.0000	12.000	150.00
	30.015	3.5541	7.0000	3.9980	4.0000	12.000	216.00
	2885.	97.31	1.0000				
	76.55	13.71					
	8230.	13.07					
	1753.	10787.					
20.00	456.00	43.797	43.997	500.00	9.1200	2392.1	22345.
	995.03	106.59	82.467	995.43	19.910	1.8804	30053.
	8745.8	1716.4	907.59	8750.0	174.91	1.0000	23445.
	5997.1	1362.6	622.35	5000.0	119.94	2403.2	1371.0
	7196.5	1040.7	746.82	7200.0	143.93	.2289	1371.4
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	400.54	467.76	0.	0.	16.000	0.
	48.023	4.2148	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9390	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4639	7.0000	3.9981	4.0000	12.000	216.00
	3605.	121.65	1.0000				
	95.59	23.39					
	10287.	16.33					
	2199.	12873.					
24.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22346.
	995.11	106.77	82.461	995.52	19.902	1.8804	30053.
	8745.8	1716.4	907.58	8750.0	174.91	1.0000	23445.
	5997.1	1362.9	622.34	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.81	7200.0	143.93	.4026	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	411.39	467.61	0.	0.	16.000	0.
	48.023	4.1995	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8787	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4580	7.0000	3.9981	4.0000	12.000	216.00
	4329.	145.95	1.0000				
	114.82	28.07					
	12345.	19.60					
	2639.	14752.					

28.00	456.00	43.793	43.998	500.00	9.1199	2392.0	22346.
	995.18	106.71	82.465	995.57	19.303	1.8804	30053.
	8745.8	1715.	907.61	3750.0	174.91	1.0000	23446.
	5997.1	1362.	622.36	6000.0	119.94	2403.3	1371.3
	7196.5	1041.	746.83	7200.0	143.93	.4611	1371.7
	0.	43.998	1871.2	0.	0.	11.994	0.
	0.	387.93	467.83	0.	0.	16.000	0.
	48.023	4.2317	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9117	.9995	2.9985	3.0100	12.000	150.00
	30.015	3.4327	7.0000	3.9981	4.0100	12.000	215.00
	5043.	170.22	1.0000				
	133.36	32.77					
	14402.	22.87					
	3079.	16479.					
32.00	456.00	43.793	43.998	500.00	9.1199	2392.0	22346.
	995.18	106.62	82.461	995.55	19.303	1.8803	30053.
	8745.8	1715.4	907.61	3750.0	174.91	1.0000	23446.
	5997.1	1362.1	622.36	6000.0	119.94	2403.3	1371.3
	7196.5	1041.7	746.84	7200.0	143.93	.3969	1371.6
	0.	43.999	1871.2	0.	0.	11.994	0.
	0.	372.55	467.82	0.	0.	16.000	0.
	48.023	4.2415	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9190	.9995	2.9985	3.0100	12.000	150.00
	30.015	3.4392	7.0000	3.9981	4.0000	12.000	216.00
	5770.	194.61	1.0000				
	153.09	37.42					
	16459.	26.13					
	3518.	19016.					
36.00	456.00	43.793	43.998	500.00	9.1199	2392.1	22345.
	995.14	106.63	82.462	995.51	19.303	1.8803	30053.
	8745.8	1715.	907.60	3750.0	174.91	1.0000	23445.
	5997.1	1362.5	622.36	6000.0	119.94	2403.2	1371.2
	7196.5	1041.7	746.83	7200.0	143.93	.3375	1371.6
	0.	43.995	1871.2	0.	0.	11.994	0.
	0.	376.35	467.80	0.	0.	16.000	0.
	48.023	4.2257	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3977	.9995	2.9986	3.0100	12.000	150.00
	30.014	3.4762	7.0000	3.9981	4.0000	12.000	215.00
	6491.	218.34	1.0000				
	172.23	47.13					
	19516.	29.49					
	3957.	19415.					

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PAGE 21 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL LFE

40.00	456.00	43.733	43.997	500.00	9.1200	2392.1	22345.
	995.12	106.73	82.459	995.51	19.302	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23445.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1041.7	746.82	7200.0	143.93	.3383	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	385.03	467.80	0.	0.	16.000	0.
	48.023	4.2104	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3871	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4647	7.0000	3.9981	4.0000	12.000	215.00
	7213.	243.27	1.0000				
	191.37	46.79					
	20573.	32.65					
	4397.	20631.					
44.00	456.00	43.733	43.997	500.00	9.1199	2392.1	22345.
	995.13	106.77	82.461	995.52	19.302	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23445.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3636	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	386.69	467.21	0.	0.	16.000	0.
	48.023	4.2095	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3861	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4642	7.0000	3.9981	4.0000	12.000	215.00
	7934.	257.53	1.0000				
	210.50	51.45					
	22630.	35.33					
	4837.	21326.					
48.00	456.00	43.733	43.997	500.00	9.1199	2392.1	22346.
	995.15	106.70	82.459	995.53	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3728	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	383.50	467.81	0.	0.	16.000	0.
	48.023	4.2142	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3901	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4642	7.0000	3.9981	4.0000	12.000	215.00
	8655.	291.32	1.0000				
	229.64	55.14					
	24689.	39.21					
	5277.	22852.					

52.00	456.00	43.793	43.997	500.00	3.1199	2392.1	22345.
	995.15	106.70	82.457	995.53	19.903	1.8804	30053.
	8745.8	1715.	907.59	8730.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3645	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	381.77	467.81	0.	0.	16.000	0.
	48.023	4.2167	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9917	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4695	7.0000	3.9981	4.0000	12.000	215.00
	9377.	316.2	1.0000				
	248.78	50.91					
	25745.	42.45					
	5715.	23810.					
56.00	456.00	43.793	43.997	500.00	3.1199	2392.1	22346.
	995.14	106.70	82.457	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8730.0	174.91	1.0000	23445.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3565	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	381.91	467.81	0.	0.	16.000	0.
	48.023	4.2147	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9901	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4680	7.0000	3.9981	4.0000	12.000	215.00
	10098.	340.57	1.0000				
	267.31	55.49					
	28802.	45.73					
	6155.	24648.					
60.00	456.00	43.793	43.997	500.00	3.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1041.7	746.82	7200.0	143.93	.3566	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	383.02	467.80	0.	0.	16.000	0.
	48.023	4.2125	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.9898	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4665	7.0000	3.9981	4.0000	12.000	215.00
	10919.	354.89	1.0000				
	297.05	70.17					
	30859.	49.00					
	6595.	25416.					

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64.00	456.00	43.733	43.997	500.00	9.1199	2392.1	229+6.
	995.14	106.73	82.458	995.52	19.307	1.5304	30153.
	8745.8	1716.4	907.59	8750.0	174.91	1.0000	234+6.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1041.7	746.82	7200.0	143.93	.3602	1371.6
	0.	43.337	1871.2	0.	0.	11.994	0.
	0.	383.34	467.81	0.	0.	16.000	0.
	48.023	4.2123	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8387	.9995	2.3986	3.0000	12.000	150.00
	30.014	3.4657	7.0000	3.9981	4.0000	12.000	215.00
	11540.	389.22	1.0000				
	306.19	74.97					
	32915.	52.25					
	7035.	26111.					
68.00	456.00	43.733	43.997	500.00	9.1139	2392.1	229+5.
	995.14	106.70	82.458	995.52	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	234+5.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1041.7	746.82	7200.0	143.93	.3616	1971.6
	0.	43.997	1871.2	0.	0.	11.394	0.
	0.	382.39	467.81	0.	0.	16.000	0.
	48.023	4.2175	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8393	.9995	2.3966	3.0000	12.000	150.00
	30.014	3.4671	7.0000	3.3981	4.0000	12.000	215.00
	12262.	413.55	1.0000				
	325.32	79.57					
	34973.	53.37					
	7475.	25739.					
72.00	456.00	43.737	43.997	500.00	9.1199	2392.1	229+5.
	995.14	106.73	82.458	995.52	19.303	1.8804	30053.
	8745.8	1716.4	907.59	8750.0	174.91	1.0000	234+6.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1971.2
	7196.5	1040.7	746.82	7200.0	143.93	.3605	1371.6
	0.	43.337	1871.2	0.	0.	11.994	0.
	0.	392.60	467.81	0.	0.	16.000	0.
	48.023	4.2139	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8395	.9995	2.3986	3.0000	12.000	150.00
	30.014	3.4671	7.0000	3.3991	4.0000	12.000	215.00
	12983.	437.97	1.0000				
	344.46	94.29					
	37031.	58.30					
	7915.	27319.					

76.00	456.00	43.797	43.997	500.00	9.1199	2392.1	22946.
	995.14	106.79	82.458	995.52	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3594	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.83	467.81	0.	0.	16.000	0.
	48.023	4.2135	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3397	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4672	7.0000	3.9981	4.0000	12.000	215.00
	13704.	462.20	1.0000				
	363.50	88.83					
	39089.	52.05					
	8355.	27823.					
80.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22946.
	995.14	106.79	82.458	995.52	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3594	1871.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.84	467.81	0.	0.	16.000	0.
	48.023	4.2133	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3331	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4679	7.0000	3.9981	4.0000	12.000	216.00
	14425.	486.52	1.0000				
	382.73	93.55					
	41145.	55.33					
	8795.	28288.					
84.00	455.00	43.797	43.997	500.00	9.1199	2392.1	22946.
	995.14	106.79	82.458	995.52	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.89	467.81	0.	0.	16.000	0.
	48.023	4.2133	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8891	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4679	7.0000	3.9981	4.0000	12.000	216.00
	15147.	510.87	1.0000				
	401.87	98.24					
	43202.	68.53					
	9234.	28710.					

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PAGE 25 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL LFE

88.00	456.00	43.737	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.77	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.62	7200.0	143.93	.3601	1371.6
	0.	43.337	1871.2	0.	0.	11.994	0.
	0.	382.83	467.61	0.	0.	16.000	0.
	48.023	4.2135	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3332	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	215.00
	15363.	535.19	1.0000				
	421.01	102.37					
	45259.	71.85					
	9674.	29031.					
92.00	456.00	43.737	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.77	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.62	7200.0	143.93	.3600	1371.6
	0.	43.337	1871.2	0.	0.	11.994	0.
	0.	382.73	467.61	0.	0.	16.000	0.
	48.023	4.2135	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3332	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4671	7.0000	3.9981	4.0000	12.000	216.00
	16583.	559.50	1.0000				
	440.14	107.53					
	47315.	75.13					
	10114.	29435.					
96.00	456.00	43.737	43.997	500.00	9.1199	2392.1	22345.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.62	7200.0	143.93	.3598	1371.6
	0.	43.337	1871.2	0.	0.	11.994	0.
	0.	382.73	467.61	0.	0.	16.000	0.
	48.023	4.2174	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3332	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4671	7.0000	3.9981	4.0000	12.000	215.00
	17311.	593.33	1.0000				
	459.28	112.27					
	49374.	79.37					
	10559.	29749.					

100.00	456.00	43.797	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1716.	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.31	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8892	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	18032.	598.17	1.0000				
	478.41	116.37					
	51431.	81.53					
	10993.	30039.					
- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
104.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1716.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1352.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.81	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8892	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	18753.	532.42	1.0000				
	497.55	121.63					
	53488.	84.93					
	11433.	30296.					
- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
108.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1716.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	382.81	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8892	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	19474.	656.81	1.0000				
	516.59	125.71					
	55545.	88.13					
	11873.	30517.					

PAGE 27 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL LFE

112.00	456.00	43.793	43.997	500.00	3.1139	2392.1	22345.
	995.14	105.79	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.30	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8392	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	20195.	681.17	1.0000				
	535.92	130.9[illegible]					
	57602.	91.4[illegible]					
	12313.	30726.					
116.00	456.00	43.793	43.997	500.00	3.1139	2392.1	22345.
	995.14	105.79	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.[illegible]	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	392.30	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8392	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	20917.	705.45	1.0000				
	554.35	135.65					
	59659.	94.72					
	12752.	30916.					
120.00	456.00	43.793	43.997	500.00	3.1139	2392.1	22345.
	995.14	106.79	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.5	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.397	1871.2	0.	0.	11.994	0.
	0.	382.30	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8392	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	21639.	729.79	1.0000				
	574.10	140.34					
	61717.	97.93					
	13192.	31037.					

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124.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22345.
	995.14	106.70	82.458	995.52	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	382.80	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8833	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	215.00
	22359.	754.11	1.0000				
	593.23	145.02					
	63774.	101.25					
	13632.	31242.					
128.00	455.00	43.797	43.997	500.00	9.1199	2392.1	22345.
	995.14	106.70	82.458	995.52	19.303	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.3	622.35	6000.0	119.94	2403.2	1971.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	382.80	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3833	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	216.00
	23081.	778.43	1.0000				
	612.37	149.70					
	65831.	104.52					
	14071.	31332.					
132.00	455.00	43.793	43.997	500.00	9.1199	2392.1	22345.
	995.14	106.70	82.458	395.52	19.303	1.8804	30053.
	8745.9	.715.-	907.59	6750.0	174.91	1.0000	23445.
	5997.1	1362.9	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1041.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1871.2	0.	0.	11.994	0.
	0.	382.81	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.3832	.9995	2.9986	3.0010	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	215.00
	23802.	302.73	1.0000				
	631.51	154.39					
	67988.	107.73					
	14511.	31519.					

136.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.6	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1371.2	0.	0.	11.994	0.
	0.	382.80	467.61	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8832	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	215.00
	24523.	327.03	1.0000				
	650.54	159.05					
	69945.	111.05					
	14951.	31624.					

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140.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1371.2	0.	0.	11.994	0.
	0.	382.80	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8832	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	215.00
	25245.	351.41	1.0000				
	669.78	153.77					
	72002.	114.32					
	15391.	31728.					

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144.00	456.00	43.793	43.997	500.00	9.1199	2392.1	22346.
	995.14	106.70	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.6	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1371.6
	0.	43.997	1371.2	0.	0.	11.994	0.
	0.	382.80	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8832	.9995	2.9985	3.0000	12.000	150.00
	30.014	3.4670	7.0000	3.9981	4.0000	12.000	215.00
	25965.	375.74	1.0000				
	698.32	153.41					
	74060.	117.52					
	15830.	31822.					

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148.00	456.00	43.797	43.907	500.00	9.1139	2392.1	22346.
	995.14	196.77	82.458	995.52	19.903	1.8804	30053.
	8745.8	1715.4	907.59	8750.0	174.91	1.0000	23446.
	5997.1	1362.8	622.35	6000.0	119.94	2403.2	1371.2
	7196.5	1040.7	746.82	7200.0	143.93	.3599	1871.6
	0.	43.937	1871.2	0.	0.	11.994	0.
	0.	382.80	467.81	0.	0.	16.000	0.
	48.023	4.2134	221.69	1.2494	1.2500	12.000	420.00
	25.012	2.8332	.9995	2.9986	3.0000	12.000	150.00
	30.014	3.4677	7.0000	3.9981	4.0000	12.000	216.00
	26687.	900.05	1.0000				
	708.05	173.09					
	76117.	120.35					
	16270.	31907.					

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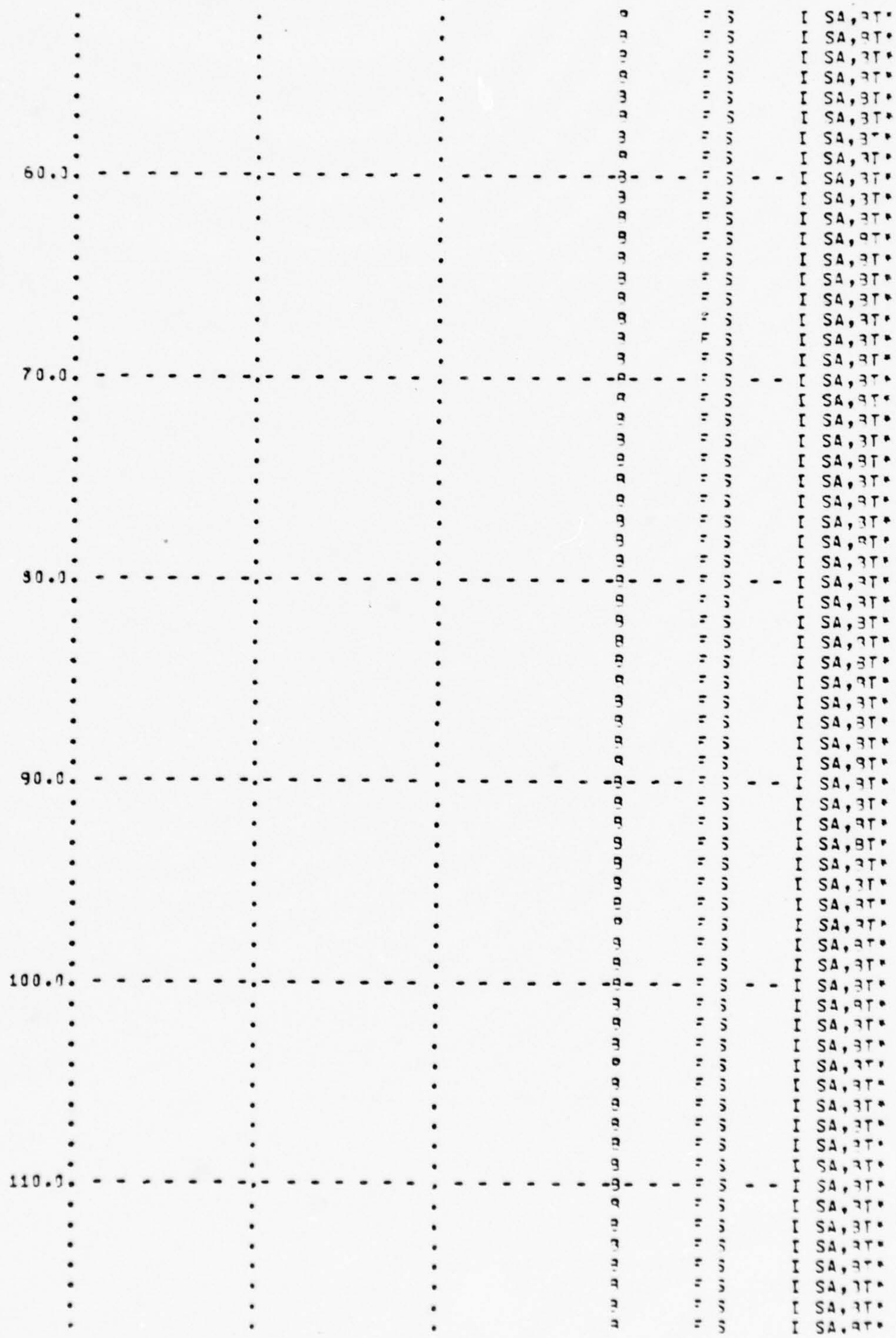
PAGE  31  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            LFE

 JOB(1)=S   JOB(2)=I   JOB(3)=F   JOB(4)=B   JOB(5)=A   TOTFOR=T
 FORSIZ=*

420.000          430.000          440.000          450.000          460.000  S
  0.000T            .250T            .500T            .750T            1.000T I
  0.000T           2.500T           5.000T           7.500T           10.000T F
  0.000T           2.000T           4.000T           6.000T            8.000T BA
  0.000T          10.000T          20.000T          30.000T           40.000T T*
  0.0. - - - - - - - -.- - - - - S - . - - - - - - - -B- - - -FA - - I  BT*
     .                .                .          S   B       F A      I  BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F A     SI  BT*
     .                .                .              B       F A   S  I  BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       FSA      I  BT*
     .                .                .              B       FSA      I  BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
 10.0. - - - - - - - -.- - - - - - - - . - - - - - - - -B- - - F S - - I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
 20.0. - - - - - - - -.- - - - - - - - . - - - - - - - -B- - - F S - - I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
 30.0. - - - - - - - -.- - - - - - - - . - - - - - - - -B- - - F S - - I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
 40.0. - - - - - - - -.- - - - - - - - . - - - - - - - -B- - - F S - - I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
 50.0. - - - - - - - -.- - - - - - - - . - - - - - - - -B- - - F S - - I  SA,BT*
     .                .                .              B       F S      I  SA,BT*
```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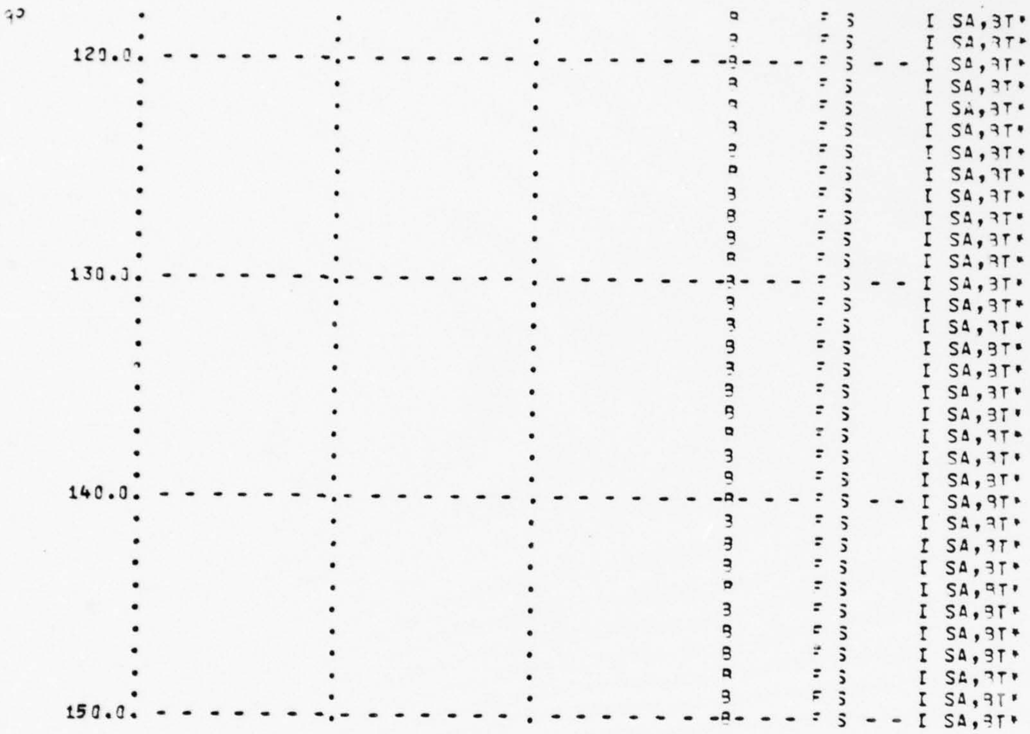
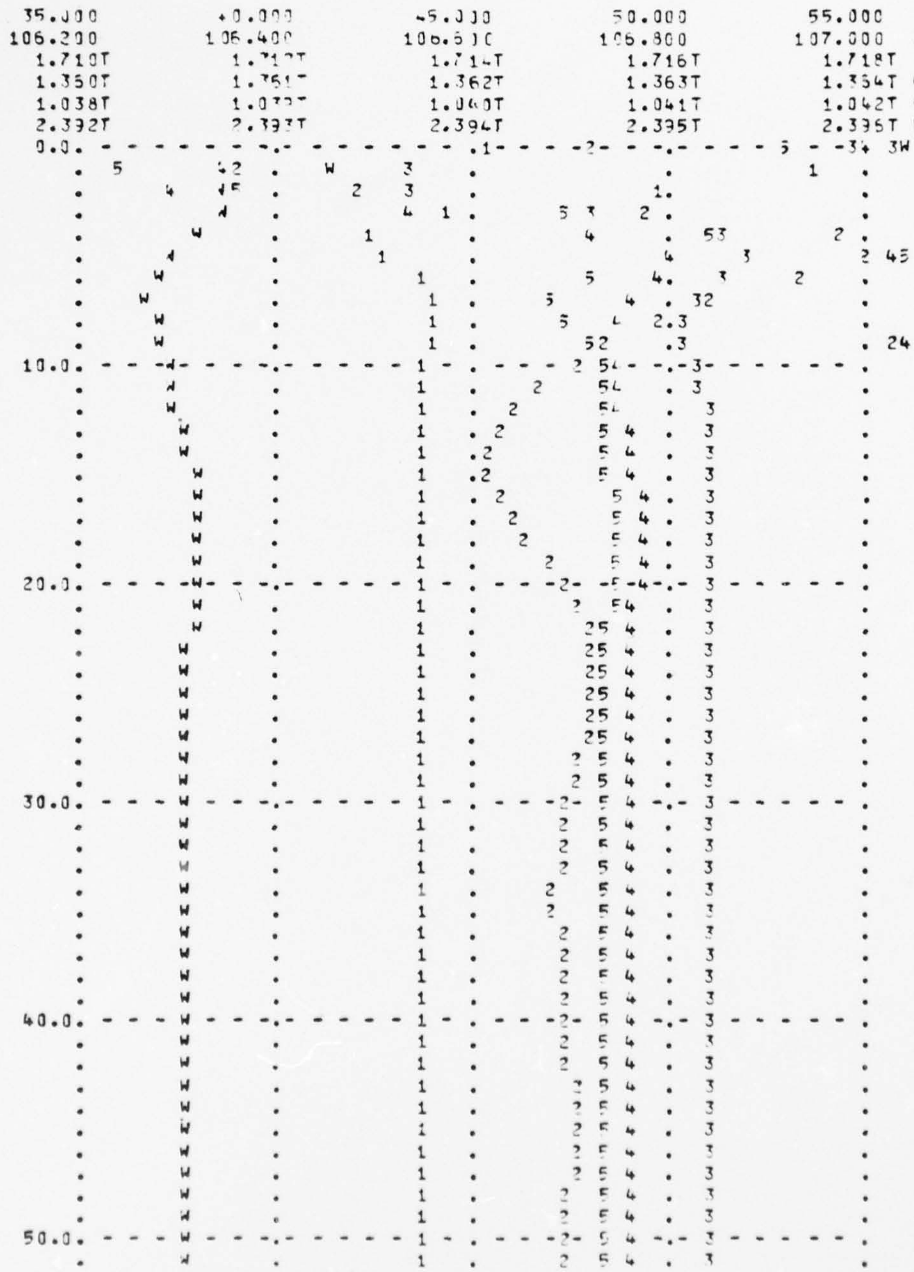
70.0
80.0
90.0
100.0
110.0

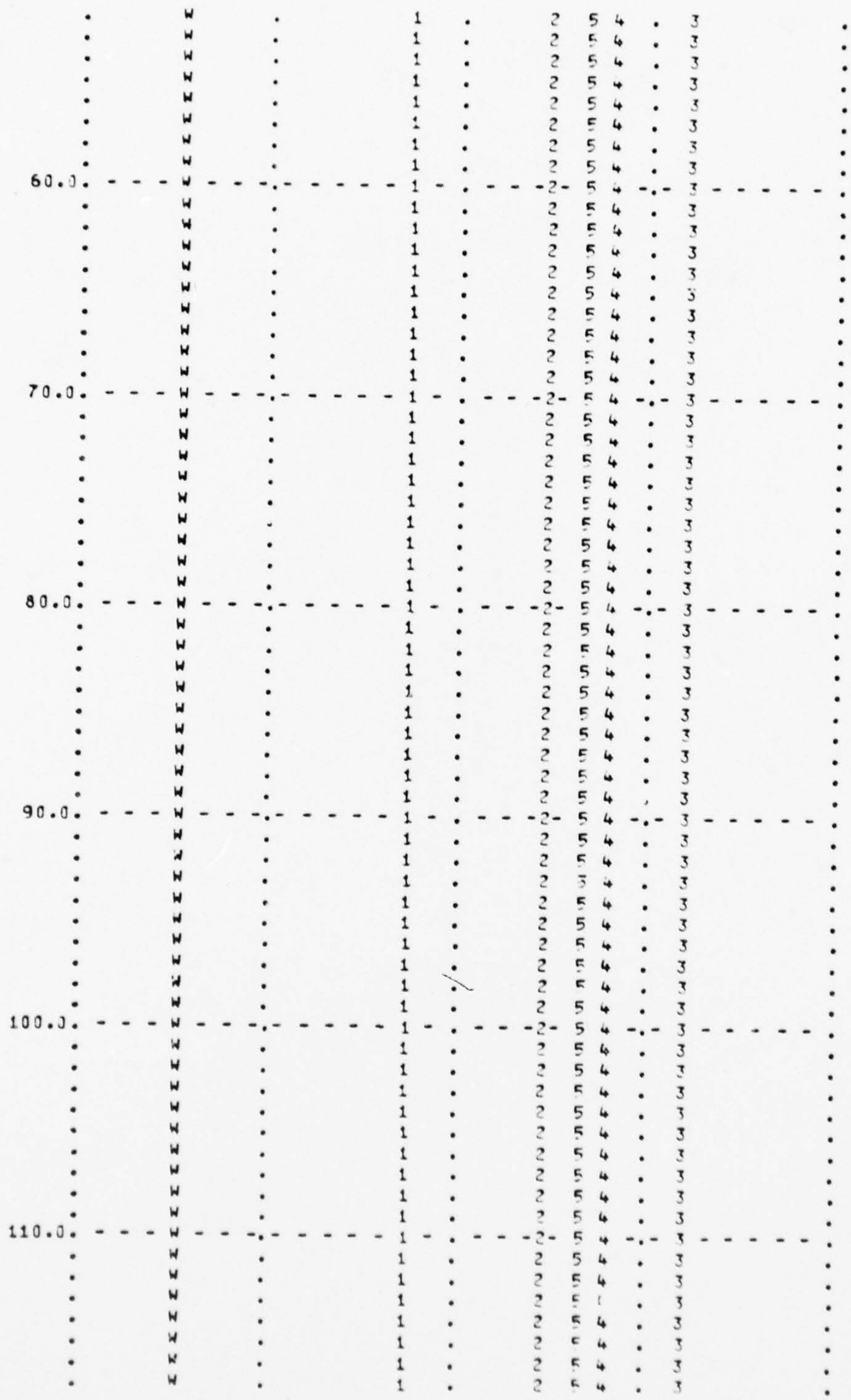

120.0
130.0
140.0
150.0
SA,BT

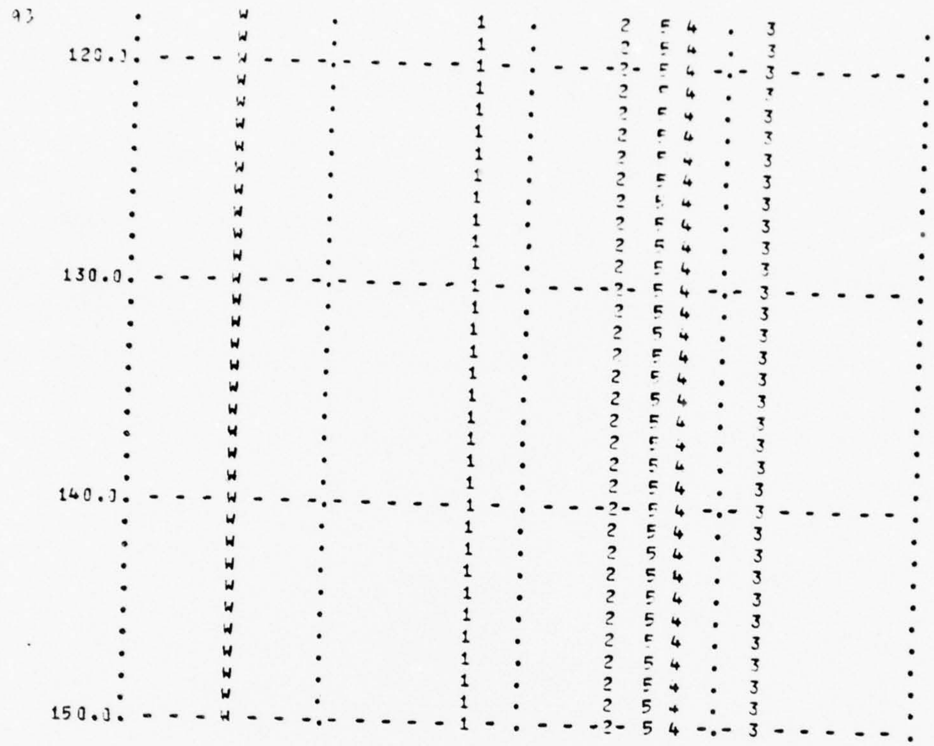
PAGE 32 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL LEE

TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W



92




120.0
130.0
140.0
150.0

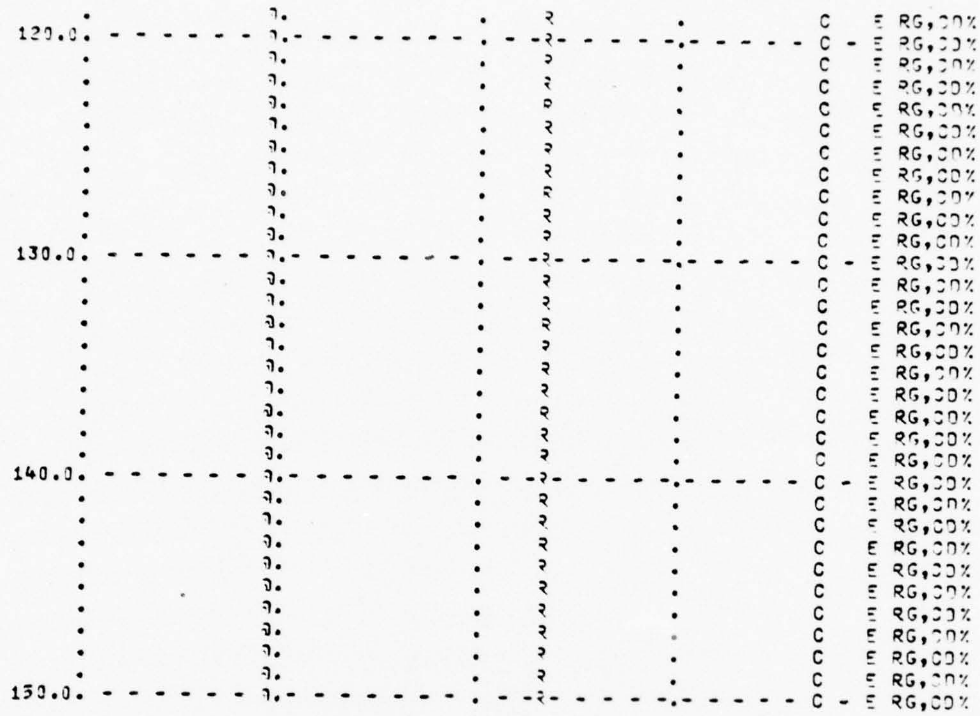
64

```
PAGE  33  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            LEE

PRED=R  UPT=G  DSIZE=C  DCSIZE=D  TPINS=%  FOFFC=E  TRNSFD=@

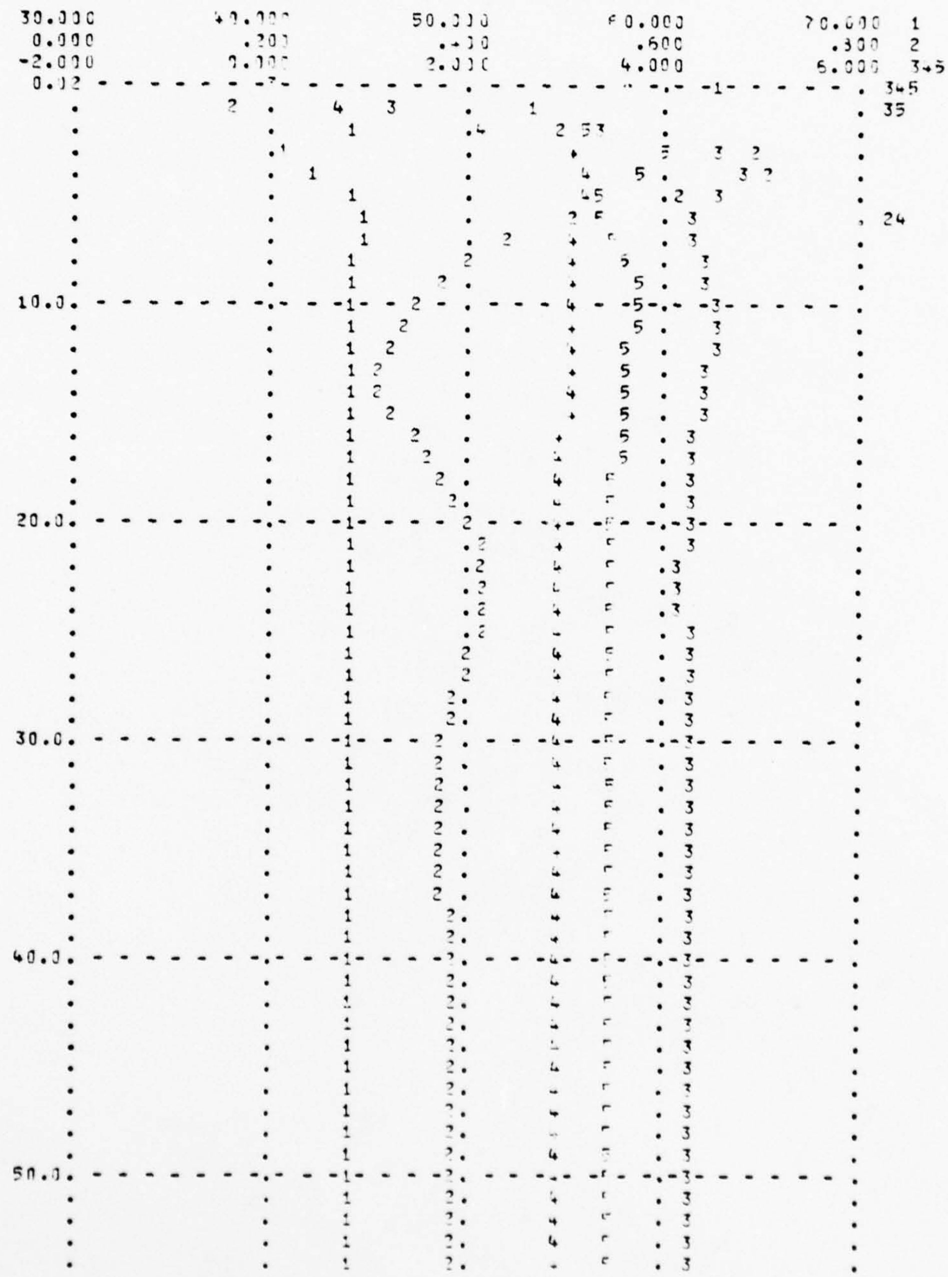
  0.000          200.000         400.000          600.000         800.000  RG
  0.000T            .500T          1.000T            1.500T          2.000T  CD
  0.000             .500           1.000             1.500           2.000  %
  0.000             .250            .500              .750           1.000  E
   .222             .222            .222              .222            .222  @
  0.0. - - - - - - -.- - - - - - - - . - -R- - - - - -.- - - - - -@C - E RG,CD%
     .               .          @    .    R            .           C   E RG,CD%
     .    @          .               .    R            .           C   E RG,CD%
     .  @            .               .    R            .           C   E RG,CD%
     .       @       .               .    R            .           C   E RG,CD%
     .            @  .               .    R            .           C   E RG,CD%
     .             @ .               .    R            .           C   E RG,CD%
     .            @  .               .    R            .           C   E RG,CD%
     .           @   .               .    R            .           C   E RG,CD%
     .           @   .               .    R            .           C   E RG,CD%
 10.0. - - - - - @ -.- - - - - - - - . - -R- - - - - -.- - - - - - C - E RG,CD%
     .            @  .               .    R            .           C   E RG,CD%
     .            @  .               .    R            .           C   E RG,CD%
     .            @  .               .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
 20.0. - - - - - - @.- - - - - - - - . - -R- - - - - -.- - - - - - C - E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
 30.0. - - - - - -@-.- - - - - - - - . - -R- - - - - -.- - - - - - C - E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
     .            @ .                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
 40.0. - - - - - - @.- - - - - - - - . - -R- - - - - -.- - - - - - C - E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
 50.0. - - - - - - @.- - - - - - - - . - -R- - - - - -.- - - - - - C - E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
     .             @.                .    R            .           C   E RG,CD%
```

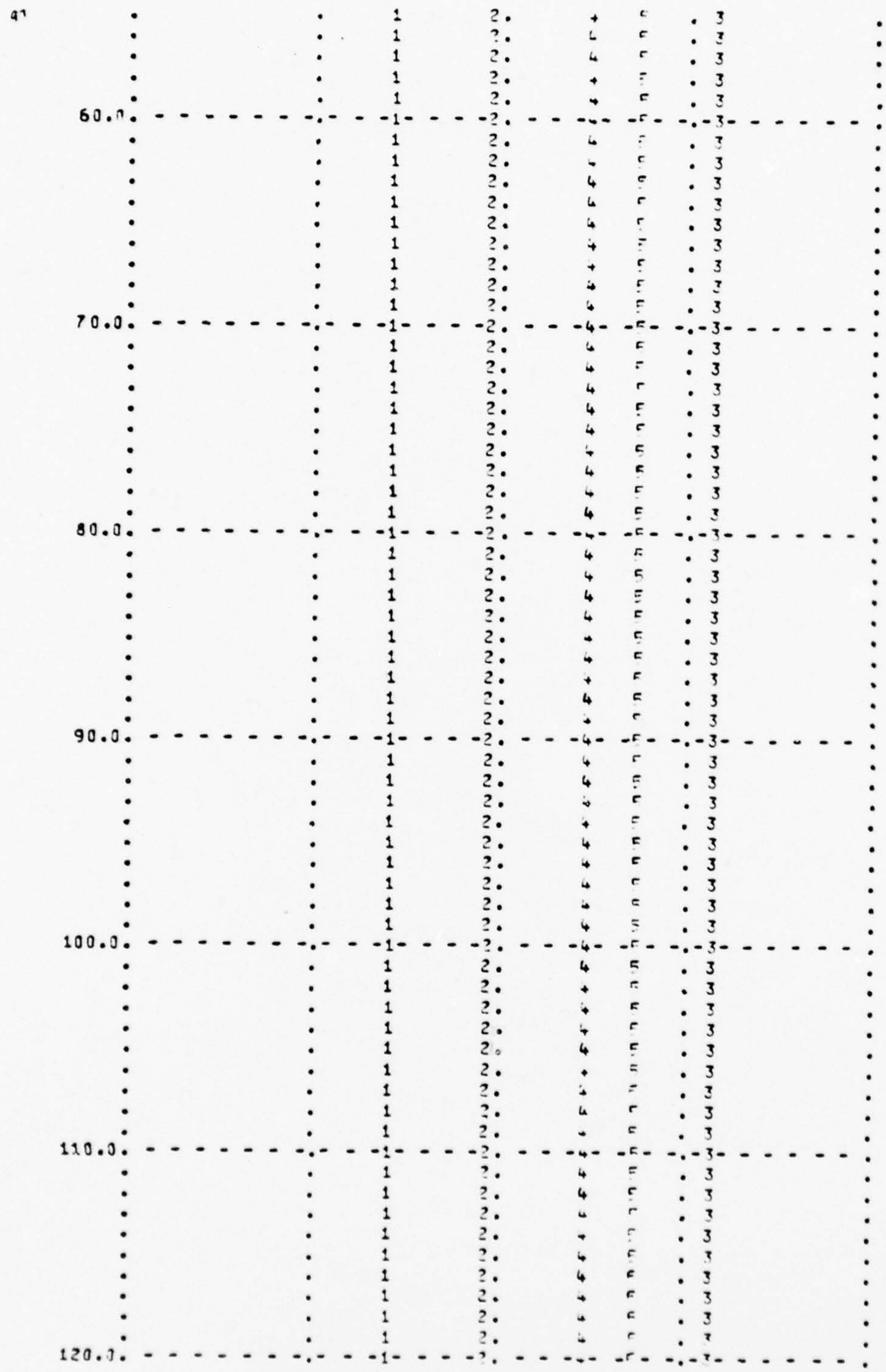
```
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
  60.0. - - - - - - - - - -  0.- - - - - - - - - . - R- - - - - - - -.- - - - - - - - C - - E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
  70.0. - - - - - - - - - -  0.- - - - - - - - - . - R- - - - - - - -.- - - - - - - - C - - E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
  80.0. - - - - - - - - - -  0.- - - - - - - - - . - R- - - - - - - -.- - - - - - - - C - - E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
  90.0. - - - - - - - - - -  0.- - - - - - - - - . - R- - - - - - - -.- - - - - - - - C - - E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
 100.0. - - - - - - - - - -  0.- - - - - - - - - . - R- - - - - - - -.- - - - - - - - C - - E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
 110.0. - - - - - - - - - -  0.- - - - - - - - - . - R- - - - - - - -.- - - - - - - - C - - E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
      .                      0.                    .  R              .                C     E RG,CD%
```


120.0
130.0
140.0
150.0
RG,OD%

PAGE 34 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL LFF

DFDSC(1)=1 DFDSC(2)=2 DFDSC(3)=3 DFDSC(4)=4 DFDSC(5)=5

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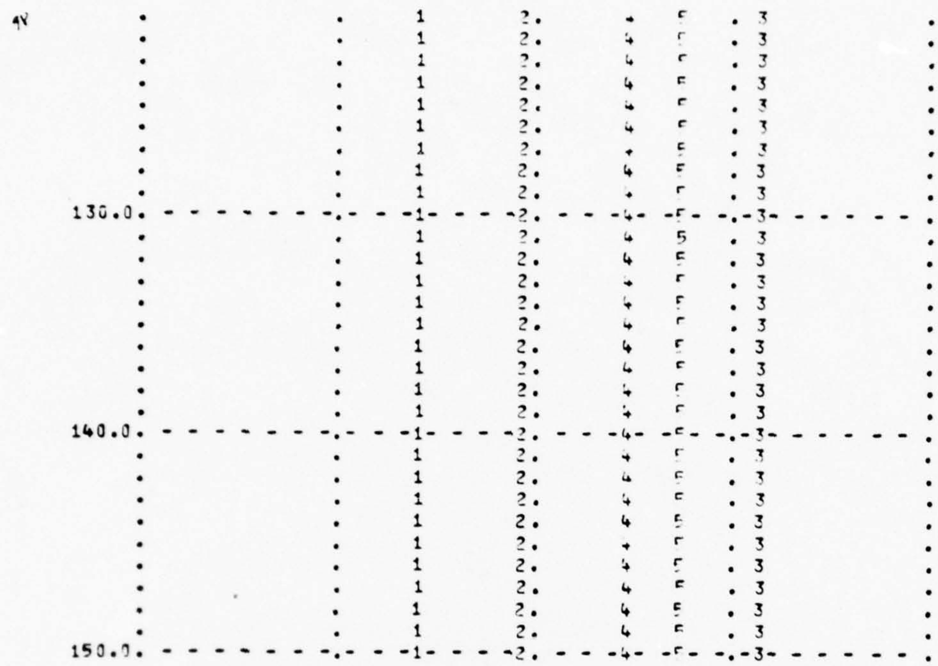
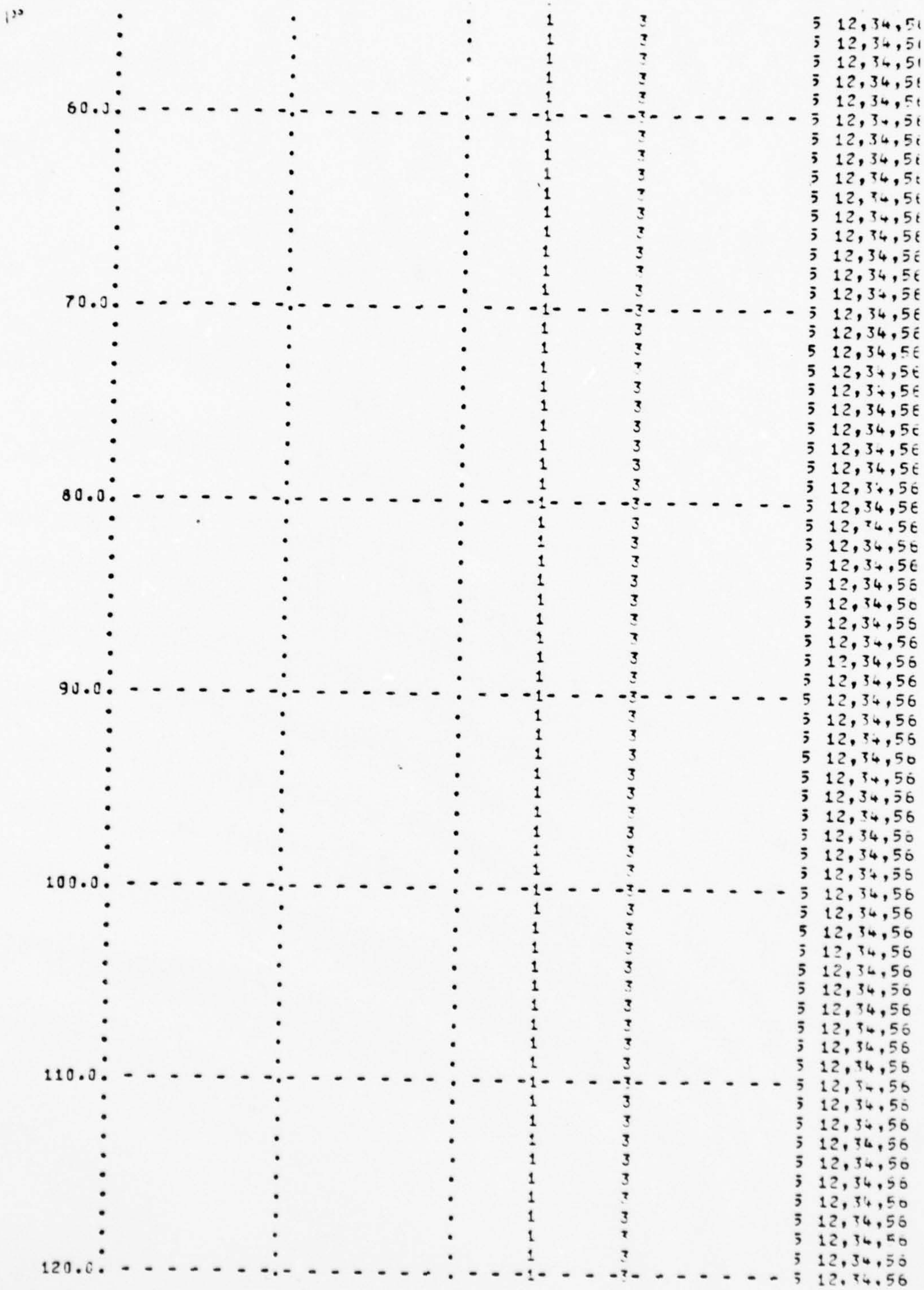
70.0
80.0
90.0
100.0
110.0
120.0


130.0
140.0
150.0

```
CRATIO(3)=1  OCRATI(3)=2  CRATIO(4)=3  OCRATI(4)=4  CRATIO(5)=5
OCRATI(5)=6

 0.000          .500           1.000           1.500           2.000  12
 0.000         1.000           2.000           3.000           4.000  3456
 0.0. - - - - - - - -.- - - - - - - - . - - -21 - - -3- - - - - - - - 5 34,56
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
10.0. - - - - - - - -.- - - - - - - - . - - -1- - - -3- - - - - - - - 5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
20.0. - - - - - - - -.- - - - - - - - . - - -1- - - -3- - - - - - - - 5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
30.0. - - - - - - - -.- - - - - - - - . - - -1- - - -3- - - - - - - - 5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,5
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
40.0. - - - - - - - -.- - - - - - - - . - - -1- - - -3- - - - - - - - 5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
50.0. - - - - - - - -.- - - - - - - - . - - -1- - - -3- - - - - - - - 5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
    .              .               .       1       3                5 12,34,56
```


60.0
70.0
80.0
90.0
100.0
110.0
120.0
12,34,56

```
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
 130.0. - - - - -.- - - - - . - -1- - -3- - - - - 5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
 140.0. - - - - -.- - - - - . - -1- - -3- - - - - 5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
      .         .         .    1    3         5 12,34,5
 150.0. - - - - -.- - - - - . - -1- - -3- - - - - 5 12,34,5
```

APPENDIX F

KOREAN WAR TO PRESENT LISTING

APPENDIX F

Korean War to Present Listing

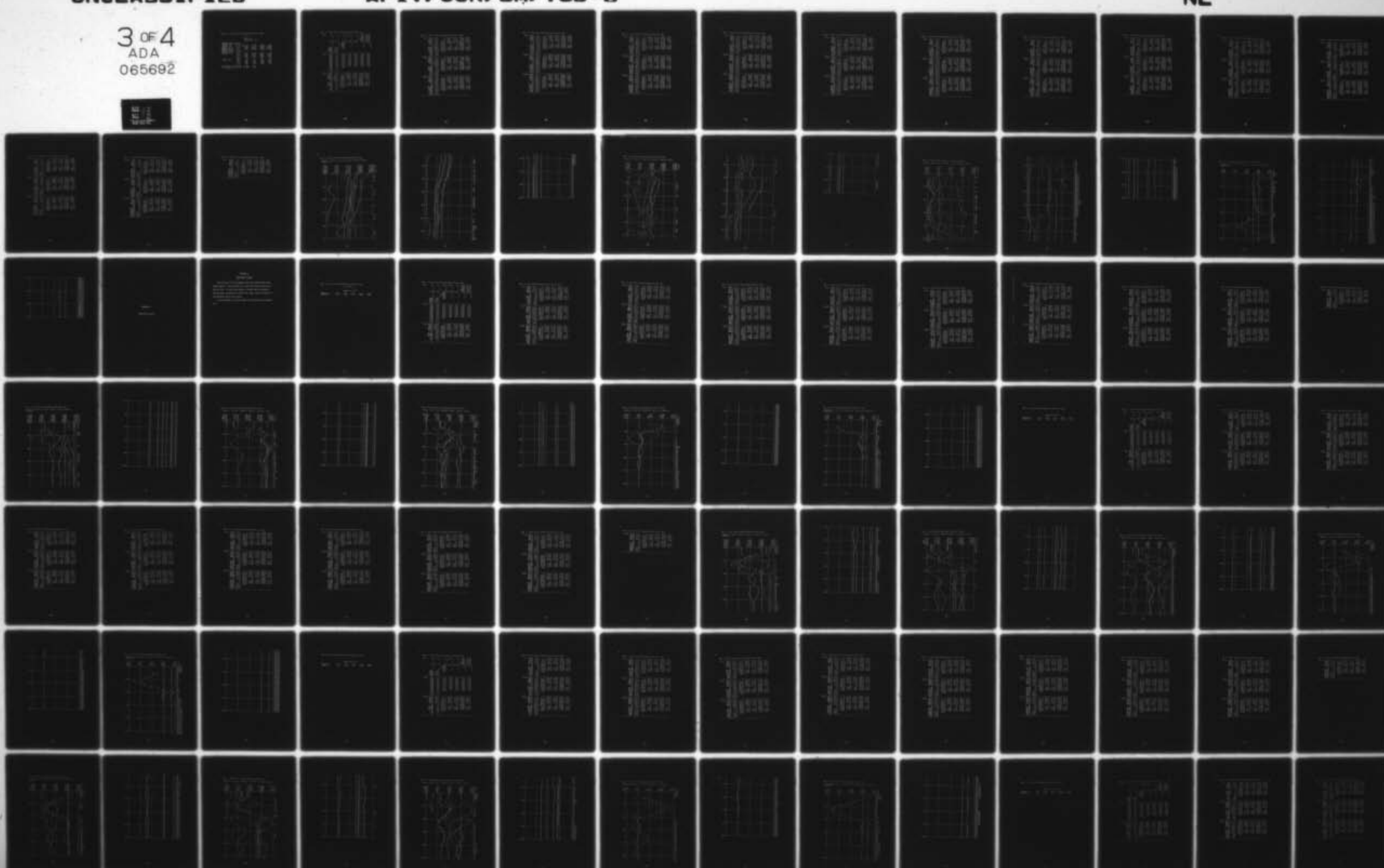
The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

AD-A065 692 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH--ETC F/G 5/1
SYSTEMS DYNAMICS MODELING APPROACH TO ANALYSIS OF THE USAF PILO--ETC(U)
DEC 78 P L FEKKE

UNCLASSIFIED AFIT/GOR/SM/78D-6 NL

3 OF 4
ADA
065692



13'

PAGE 15 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

F--

KOREA RUN

CHANGES FOR RERUN -

ORIGINAL LENGTH	100.000				
PRESENT LENGTH	150.000				
ORIGINAL JOBI	3.125T	640.000	4.375T	3.000T	3.500T
PRESENT JOBI	9.000T	1.155T	13.125T	9.000T	10.300T
ORIGINAL POLACF	0.000	0.000	3.500T	1.000T	900.000
PRESENT POLACF	0.000	0.000	10.500T	3.000T	2.700T
ORIGINAL POLHRS	[illegible]3.000T				
PRESENT POLHRS	1.1[illegible]0M				
ORIGINAL TEFF	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000
	1.000	1.000	1.000	1.000	1.000
	1.000				
PRESENT TEFF	1.000	.870	.850	.840	.830
	.800	.770	.730	.650	.570
	.810	.760	.550	.530	.510
	.5[illegible]0	.560	.500	.460	.410
	.4[illegible]0				

ABOVE RANGE OF TABLE TREC AT TIME 0.00
IN RANGE OF TABLE TREC AT TIME 0.00

```
PAGE  16  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

  TIME        JOB     TRNG     NEED  OFORCE     ATT    WIND  OTHFOR
                2        2        2       2       2   TRINS  TOTFOR
                3        3        3       3       3     CAP  TODFOR
                4        4        4       4       4  TONEED   OSIZE
                5        5        5       5       5   FORCE  DOSIZE
             HEPR   OEDSC      PATT  CRATIO  DCRATI     ATJ  AHOURS
                2        2     PREC       2       2       2       2
                3        3   TRNGFC       3       3       3       3
                4        4    FOEFC       4       4       4       4
                5        5     TOEL       5       5       5       5
            SCOST   RCOST      TRAV
            PCOST   ACOST
            TCOST  TOTCOF
            UCOST   OCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  E-00       E-00    E-00      E-00    E-00    E-00    E-00    E-00
             E-00    E-00      E-00    E-00    E-00    E-00    E-00
             E-00    E-00      E-00    E-00    E-00    E-00    E-00
             E-00    E-00      E-00    E-00    E-00    E-00    E-00
             E-00    E-00      E-00    E-00    E-00    E-00    E-00
             E-00    E-00      E-00    E-00    E-10    E-00    E-00
             E-00    E-00      E-00    E-00    E-00    E-00    E-00
             E-04    E-07      E-03    E-00    E-00    E-00    E 03
             E-00    E-00      E-00    E-00    E-00    E-00    E 03
             E-00    E-00      E-00    E-00    E-00    E-00    E 03
             E 06    E 05      E-00
             E 05    E 05
             E 09    E 07
             E 05    E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  0.00      9000.   931.0        0.  5838.3  156.24  4427.5  35735.
            1155.0  123.3    2759.2  3859.5  21.590  4.0000  54747.
            13125.  2575.3   1356.2  13125.  245.74  1.2310  45533.
            9000.0  2046.3    930.0  9000.0  159.26  6151.4  4520.0
            10800.  1562.9   1115.0  10800.  201.88  3829.3   7275.
                0.  -151.2   3446.4      0.      0.  11.115      0.
                0.  2714.7   1043.5      0.      0.  16.000      0.
            49.000     -.1   213.10  1.2500  1.2500  12.000  530.00
            25.000     -.1   1.0000  3.0000  3.0000  12.000  225.00
            30.000     -.1   8.6170  4.0000  4.0000  12.000  324.00
                0.    0.00   1.0000
               0.0    0.00
              0.00    0.00
                0.      0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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PAGE 17 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

4.00	9413.	2674.4	0.	9391.9	193.30	4265.5	23935.
	3230.5	295.[illegible]	0.0	1230.1	33.015	.4543	53334.
	12034.	1513.[illegible]	702.7	11413.	253.36	1.0000	39327.
	9230.3	1295.[illegible]	458.5	7530.0	174.53	1784.6	1467.6
	9847.	974.[illegible]	623.4	9396.	207.71	-2659.9	755.
	0.	-76.[illegible]	3435.9	0.	0.	13.386	0.
	0.	-1940.5	366.9	0.	0.	16.000	0.
	45.546	-615.1	197.33	1.3173	1.2500	12.000	543.10
	23.640	-450.35	1.0529	3.1725	3.0000	12.000	135.75
	28.627	-450.[illegible]	7.0000	4.1918	4.0000	12.000	231.58
	1297.	49.0[illegible]	.9617				
	33.3	8.43					
	3.79	5.54					
	463.	5377.					
8.00	12093.	1732.[illegible]	0.	3720.3	257.52	4785.6	23222.
	1057.9	11.[illegible]	0.0	235.5	22.537	.7705	52755.
	11090.	2195.[illegible]	1230.2	11156.	236.26	.9530	35342.
	7581.2	1709.1	863.5	7550.0	151.50	3060.3	315.1
	9180.	1339.[illegible]	966.6	9180.	195.57	-3228.0	400.
	0.	-3372.[illegible]	3504.9	0.	0.	12.293	0.
	0.	-822.4	203.8	0.	0.	16.000	0.
	48.295	65.[illegible]	222.93	1.2426	1.2300	12.000	535.50
	25.227	58.75	.9952	2.3730	3.0000	12.000	131.25
	29.999	-[illegible]	6.7412	4.0002	4.0000	12.000	275.40
	2569.	65.57	1.0370				
	70.5	17.39					
	7.53	11.52					
	1162.	10441.					
12.00	12225.	1594.5	0.	5733.0	253.99	4325.8	23279.
	530.1	38.9	144.5	520.8	11.013	2.5141	51705.
	11093.	2152.[illegible]	1096.4	11025.	230.55	1.0000	37011.
	7612.2	1727.5	749.7	7550.0	153.13	2904.7	1332.8
	9113.	1292.[illegible]	914.2	9072.	189.42	-1925.0	1531.
	0.	-3493.[illegible]	3456.9	0.	0.	12.034	0.
	0.	90.[illegible]	333.2	0.	0.	16.000	0.
	47.635	-72.[illegible]	215.09	1.2583	1.2510	12.000	523.20
	24.829	-57.1[illegible]	1.0062	3.0207	3.0000	12.000	139.00
	29.849	-46.[illegible]	7.0000	4.0203	4.0000	12.000	272.16
	3825.	79.5[illegible]	.9677				
	107.0	25.39					
	11.50	17.37					
	1730.	15333.					

16.00	10960.	1013.7	0.	8437.5	221.57	3976.2	29678.
	1150.0	384.1	269.7	1360.2	23.450	2.2791	49936.
	10942.	2091.5	1097.6	10694.	221.21	1.0644	37165.
	7507.2	1554.7	749.5	7470.0	151.77	3020.5	2543.6
	9003.	1277.2	903.7	8364.	132.01	-534.7	2905.
	0.	-2472.3	3339.4	0.	0.	11.973	0.
	0.	190.2	560.9	0.	0.	16.000	0.
	47.737	-48.7	206.01	1.2536	1.2500	12.000	522.30
	24.875	-37.15	1.0046	3.0149	3.0000	12.000	136.75
	29.870	-79.1	7.4505	4.0175	4.0000	12.000	253.92
	5047.	103.31	.9739				
	140.3	34.22					
	15.27	22.63					
	2097.	19772.					
20.00	10397.	1347.4	0.	8431.2	213.15	3853.4	27557.
	1404.3	52.5	0.0	1216.9	29.739	1.5862	43354.
	10647.	1915.3	977.3	10500.	218.27	1.0228	35939.
	7305.0	1525.4	666.6	7200.0	149.76	2458.3	2227.5
	8749.	1137.7	814.3	8540.	179.36	-1181.9	2050.
	0.	-1965.7	3231.7	0.	0.	12.239	0.
	0.	-187.4	556.9	0.	0.	16.000	0.
	47.337	-147.0	203.75	1.2675	1.2500	12.000	504.00
	24.541	-105.0	1.0137	3.0438	3.0000	12.000	130.00
	29.627	-109.7	7.1593	4.0503	4.0000	12.000	253.20
	6225.	135.39	.9832				
	171.4	42.15					
	19.70	27.76					
	2450.	21995.					
24.00	10809.	1494.1	0.	8204.9	225.59	3952.8	25007.
	971.7	2.1	0.0	554.9	20.370	1.2860	47332.
	10221.	1853.3	966.0	10106.	214.27	1.0000	34212.
	7310.5	1473.5	561.2	6930.0	145.36	2422.9	1249.6
	8410.	1127.7	795.6	8316.	175.29	-2174.4	1034.
	0.	-2504.2	3177.9	0.	0.	12.280	0.
	0.	-316.5	312.4	0.	0.	16.000	0.
	47.459	-115.2	209.35	1.2543	1.2500	12.000	435.10
	24.713	-80.51	1.0114	3.0349	3.0000	12.000	173.25
	29.666	-93.5	7.0000	4.0451	4.0000	12.000	249.48
	7374.	159.73	1.0014				
	202.6	50.03					
	22.07	32.31					
	2959.	24930.					

PAGE 19 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

28.00	11415.	1773.9	0.	7581.1	244.36	3995.8	24259.
	541.8	.1	0.0	232.6	11.396	1.1229	45304.
	9755.	1712.1	869.4	9581.	208.82	.9217	31943.
	5693.5	1763.2	592.7	6370.0	143.29	2155.5	503.4
	8017.	1035.0	723.4	7384.	171.52	-3041.3	400.
	0.	-3734.3	3149.1	0.	0.	12.366	0.
	0.	-309.2	152.1	0.	0.	16.000	0.
	47.143	-174.1	213.37	1.2727	1.2500	12.000	459.30
	24.539	-127.55	1.0179	3.0564	3.0000	12.000	154.25
	29.501	-133.4	6.4518	4.0677	4.0000	12.000	236.52
	8499.	179.42	.9910				
	234.5	57.87					
	25.51	37.92					
	3455.	27512.					
32.00	12229.	2465.1	0.	5378.0	277.56	4173.5	21514.
	308.5	.3	0.0	213.0	7.006	1.5136	44525.
	9894.	1313.7	622.6	8531.	201.88	.9934	27452.
	6111.1	1049.3	416.6	5850.0	138.72	1572.4	457.2
	7293.	791.3	533.2	7020.	155.53	-5305.4	400.
	0.	-6389.7	3152.8	0.	0.	12.551	0.
	0.	-93.5	116.8	0.	0.	16.000	0.
	46.044	-362.1	219.44	1.3031	1.2500	12.000	403.50
	23.932	-261.12	1.0419	3.1379	3.0000	12.000	146.25
	29.879	-272.5	6.2540	4.1553	4.0000	12.000	210.50
	9592.	177.41	.9954				
	266.9	65.71					
	29.04	42.37					
	3807.	29990.					
35.00	11025.	1264.7	0.	6237.6	230.44	3795.4	22412.
	219.7	43.5	149.8	352.4	4.592	4.0000	42545.
	8607.	1910.5	1081.1	8794.	179.89	.9758	23710.
	5879.9	1493.7	759.9	6030.0	122.89	2839.5	373.8
	7132.	1159.1	848.6	7236.	149.05	-1833.2	1156.
	0.	-4727.8	2998.7	0.	0.	11.693	0.
	0.	132.7	219.7	0.	0.	16.000	0.
	49.041	186.7	227.55	1.2235	1.2500	12.000	422.10
	25.639	150.05	.9800	2.9253	3.0000	12.000	150.75
	30.440	104.7	6.8303	3.9422	4.0000	12.000	217.08
	10639.	183.71	.9895				
	299.7	73.1					
	32.52	47.77					
	4014.	32032.					

40.00	7225.	[illegible]	0.	2321.5	121.37	2527.5	30355.
	1921.1	1064.7	2428.6	4236.1	32.428	4.0000	40542.
	9319.	1762.7	2171.1	10531.	157.71	1.3000	33277.
	5392.0	1423.7	1487.0	7230.0	107.30	7692.0	7544.4
	7547.	1027.	1865.2	8746.	129.09	7512.6	10128.
	0.	95.3	2515.7	0.	0.	9.800	0.
	0.	2365.3	1575.3	0.	0.	16.000	0.
	54.757	1712.9	200.19	1.0957	1.2500	12.000	510.30
	28.512	993.02	.6759	2.6304	3.0000	12.000	132.25
	34.317	1100.5	9.1000	3.4968	4.0000	12.000	252.44
	11637.	217.61	.6899				
	326.2	79.27					
	35.32	51.92					
	4141.	33635.					
44.00	4987.	[illegible]	0.	7365.7	59.52	2747.5	23311.
	4079.5	521.5	19.0	3797.7	74.724	1.5159	33523.
	9245.	1539.4	1611.3	9375.	159.33	1.3000	35177.
	6356.3	1323.2	1090.7	6940.0	116.43	4055.0	5592.0
	7584.	1072.5	1344.0	8208.	138.32	3631.8	5035.
	0.	2479.2	2403.3	0.	0.	11.356	0.
	0.	-291.9	1351.4	0.	0.	16.000	0.
	51.733	730.5	186.49	1.1585	1.2500	12.000	478.30
	25.902	483.57	.9266	2.7879	3.0000	12.000	171.00
	32.457	523.6	9.1000	3.5960	4.0000	12.000	246.24
	12597.	235.52	1.0285				
	347.9	94.37					
	38.00	53.77					
	4402.	34931.					
48.00	5585.	1932.2	0.	6240.5	124.99	3942.9	22259.
	2512.2	20.5	0.0	328.7	55.182	.4511	40435.
	9185.	1433.7	472.8	8562.	205.42	1.0000	25500.
	6300.3	1191.5	322.4	5940.0	140.90	1205.5	1133.3
	7534.	902.5	410.2	7128.	158.49	-4273.8	400.
	0.	655.9	2513.1	0.	0.	13.764	0.
	0.	-1933.4	283.3	0.	0.	16.000	0.
	45.257	-522.3	230.45	1.3255	1.2500	12.000	415.50
	23.570	-363.20	1.0593	3.1820	3.0100	12.000	143.50
	28.394	-405.0	7.0000	4.2278	4.0010	12.000	213.84
	13550.	336.07	1.0487				
	373.4	91.27					
	40.58	60.19					
	5193.	36774.					

PAGE 21 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

52.00	10077.	2261.7	0.	4742.6	237.00	4441.1	23350.
	701.4	.3	0.0	217.2	15.496	.3576	41913.
	9251.	1514.7	872.5	3266.	134.77	.9357	25752.
	5679.9	1174.1	597.8	5570.0	133.38	2171.9	573.7
	6833.	954.2	701.6	6404.	150.70	-6271.6	400.
	0.	-5294.7	2767.4	0.	0.	12.307	0.
	0.	-434.2	169.7	0.	0.	15.000	0.
	47.925	-12.7	246.62	1.2519	1.2500	12.000	335.90
	24.957	-9.87	1.0025	3.0052	3.0000	12.000	141.75
	29.873	-23.0	6.5501	4.0170	4.0000	12.000	204.12
	14541.	347.31	1.0415				
	407.5	93.43					
	44.10	65.72					
	6223.	37938.					
55.00	10367.	2473.5	0.	3375.0	239.96	4476.9	20237.
	355.0	.3	0.0	212.8	3.218	1.4050	41701.
	8094.	1557.7	755.6	9006.	137.36	.8998	24272.
	5545.4	1248.7	542.7	5430.0	128.36	1977.1	493.8
	5653.	973.7	648.7	5318.	134.11	-5669.3	400.
	0.	-5397.1	2866.3	0.	0.	12.211	0.
	0.	-142.7	124.7	0.	0.	16.000	0.
	47.477	-13.2	256.13	1.2638	1.2500	12.000	334.30
	24.750	-55.41	1.0107	3.0307	3.0000	12.000	137.25
	29.693	-71.7	6.2984	4.0427	4.0000	12.000	137.54
	15549.	355.37	.9903				
	443.5	105.97					
	47.90	71.27					
	6980.	39420.					
60.00	10360.	2755.3	0.	3327.9	240.31	4452.0	19330.
	230.6	2.7	10.0	212.8	5.352	1.7633	40134.
	7572.	1307.5	652.5	7481.	178.41	.3813	22313.
	5271.5	1049.7	438.8	5130.0	122.58	1651.4	405.6
	6297.	794.3	550.1	6156.	145.43	-5622.8	400.
	0.	-6031.7	2841.2	0.	0.	12.311	0.
	0.	-17.3	101.7	0.	0.	16.000	0.
	46.805	-131.0	257.64	1.2819	1.2500	12.000	359.10
	24.329	-141.57	1.0252	3.1828	3.0000	12.000	129.25
	29.329	-143.3	6.1693	4.0916	4.0100	12.000	134.58
	16532.	361.40	.9922				
	479.0	112.32					
	51.78	75.45					
	7197.	40643.					

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64.00	9555.	2235.7	0.	3541.3	215.33	4098.5	13551.
	214.7	25.5	19.0	212.8	4.739	1.8756	38241.
	7362.	1453.7	778.0	7350.	154.55	.8806	22133.
	5041.3	1147.3	539.3	5040.0	112.58	1964.5	402.5
	6072.	933.7	628.3	5048.	135.72	-4023.4	400.
	0.	-5114.7	2703.1	0.	0.	12.025	0.
	0.	-1.3	100.7	0.	0.	16.000	0.
	47.923	-11.3	258.76	1.2520	1.2500	12.000	352.80
	24.934	-1.27	1.0020	3.0108	3.0000	12.000	126.00
	29.982	-24.0	6.1641	4.0158	4.0000	12.000	131.44
	17475.	366.53	.9664				
	514.0	119.57					
	55.57	81.41					
	7365.	41712.					
68.00	9565.	2686.1	0.	2802.7	224.53	4018.1	15575.
	214.0	22.3	18.1	212.8	3.025	1.8725	35174.
	6873.	1015.4	460.8	5562.	151.39	.8801	13479.
	4727.5	820.9	303.7	4500.0	111.01	1189.2	400.7
	5622.	607.9	406.7	5400.	132.01	-5354.4	400.
	0.	-5763.3	2605.5	0.	0.	12.547	0.
	0.	-1.2	100.2	0.	0.	16.000	0.
	45.834	-311.7	253.56	1.3091	1.2500	12.000	315.00
	23.737	-227.57	1.0461	3.1517	3.0000	12.000	112.50
	28.818	-221.5	6.1610	4.1641	4.0000	12.000	152.00
	18369.	371.37	.9964				
	545.4	125.37					
	59.09	85.39					
	7473.	42582.					
72.00	5233.	1685.1	0.	500.0	126.81	6152.4	15358.
	213.0	24.1	18.4	212.8	5.152	1.8789	34307.
	6165.	1054.7	556.5	6037.	149.41	.9800	15858.
	4225.1	823.3	384.1	4140.0	102.39	1408.1	403.2
	5084.	544.3	449.0	4968.	123.20	-5993.9	400.
	0.	-4732.9	2366.7	0.	0.	12.257	0.
	0.	-.2	100.1	0.	0.	16.000	0.
	47.003	-129.0	390.21	1.2765	1.2500	12.000	239.30
	24.436	-85.17	1.0217	3.0617	3.0000	12.000	103.50
	29.317	-115.7	6.1603	4.0932	4.0000	12.000	143.04
	19214.	377.03	1.0116				
	587.7	131.53					
	63.13	91.02					
	7573.	43457.					

76.00	5412.	4973..	0.	500.0	140.07	6003.4	13712.
	212.6	24.7	16.8	212.8	5.502	1.8807	32674.
	5502.	975.5	-18.2	5381.	145.01	.8800	14212.
	3846.5	704.5	282.7	3630.0	99.76	1075.6	399.8
	4595.	575..	355.9	4428.	116.95	-7426.2	400.
	0.	-4911.3	2157.5	0.	0.	12.477	0.
	0.	.2	99.9	0.	0.	16.000	0.
	46.105	-221.2	358.01	1.3014	1.2500	12.000	253.30
	23.982	-156.50	1.0404	3.1273	3.0000	12.000	92.25
	28.905	-167.7	6.1597	4.1515	4.0000	12.000	132.94
	20019.	392.27	.9930				
	535.9	136.71					
	68.35	97.21					
	7673.	44430.					
80.00	5095.	4370.5	0.	500.0	129.29	5639.1	13333.
	212.8	24.	18.7	212.8	5.410	1.8800	31130.
	5250.	1063.2	579.7	5250.	133.23	.8800	13333.
	3593.5	835.0	402.9	3600.0	91.19	1464.2	400.1
	4337.	540.0	462.9	4320.	110.05	-6536.5	400.
	0.	-4594.5	2013.6	0.	0.	12.009	0.
	0.	-.7	100.0	0.	0.	16.000	0.
	45.003	.7	406.12	1.2499	1.2500	12.000	252.00
	25.045	6.57	1.0008	2.9946	3.0000	12.000	90.00
	29.895	-15.7	6.1601	4.0155	4.0000	12.000	129.50
	20784.	387.47	.9814				
	683.3	141.57					
	73.48	103.71					
	7767.	45273.					
84.00	4757.	3804.1	0.	500.0	115.92	5113.0	13333.
	213.0	24.1	18.5	212.8	5.184	1.8792	23708.
	5259.	1084.5	564.0	5250.	128.04	.8800	13333.
	3605.9	863.3	367.1	3600.0	87.79	1435.3	400.2
	4325.	654.7	465.8	4320.	105.31	-5301.9	400.
	0.	-4257.4	1885.8	0.	0.	12.019	0.
	0.	-.2	100.0	0.	0.	16.000	0.
	47.913	-9.7	388.65	1.2523	1.2500	12.000	252.00
	24.959	-5.32	1.0016	3.0049	3.0000	12.000	90.00
	29.959	-5.9	6.1603	4.0055	4.0000	12.000	129.50
	21514.	392.57	.9700				
	726.5	146.22					
	78.26	108.91					
	7861.	45922.					

88.00	4451.	3323.7	0.	500.0	104.02	4626.6	13333.
	213.0	23.8	18.2	212.8	4.379	1.8769	23337.
	5253.	1063.0	553.6	5250.	122.30	.8800	13333.
	3607.4	844.7	382.0	3600.0	84.30	1419.1	400.2
	4327.	643.7	460.3	4320.	101.11	-4092.5	400.
	0.	-3951.3	1774.9	0.	0.	12.021	0.
	0.	-.7	100.1	0.	0.	16.000	0.
	47.918	-3.3	370.94	1.2521	1.2500	12.000	252.00
	24.948	-7.45	1.0017	3.0062	3.0000	12.000	30.00
	29.955	-6.7	6.1603	4.0060	4.0000	12.000	123.50
	22212.	337.84	.9713				
	755.5	150.57					
	82.57	114.07					
	7955.	46625.					
92.00	4144.	2875.3	0.	500.0	93.07	4179.8	13333.
	213.0	23.5	18.1	212.8	4.784	1.8789	27154.
	5257.	1058.0	554.7	5250.	118.06	.8800	13333.
	3604.7	840.2	380.5	3600.0	80.95	1409.9	400.2
	4325.	541.2	455.6	4320.	97.14	-2971.1	400.
	0.	-3544.5	1673.3	0.	0.	12.016	0.
	0.	-.7	100.1	0.	0.	16.000	0.
	47.934	-7.2	354.11	1.2517	1.2500	12.000	252.00
	24.957	-4.74	1.0013	3.0039	3.0000	12.000	30.00
	29.961	-3.3	6.1603	4.0052	4.0000	12.000	123.50
	22873.	403.04	.9709				
	800.8	154.53					
	86.48	113.75					
	8049.	47122.					
95.00	4654.	2279.3	0.	1567.7	100.50	3149.1	13333.
	213.0	23.7	17.9	212.8	4.599	1.8739	25024.
	5257.	1049.3	549.9	5250.	113.51	.8800	14350.
	3605.2	833.1	376.8	3610.0	77.84	1397.5	400.2
	4325.	533.3	452.9	4320.	93.39	-1918.9	400.
	0.	-3085.7	1585.6	0.	0.	12.016	0.
	0.	-.2	100.1	0.	0.	16.000	0.
	47.936	-7.1	306.23	1.2517	1.2500	12.000	252.00
	24.954	-5.17	1.0013	3.0043	3.0000	12.000	30.00
	29.954	-5.3	6.1603	4.0049	4.0000	12.000	123.60
	23517.	408.27	.8413				
	832.1	159.45					
	89.99	123.07					
	8143.	47533.					

PAGE 25 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

100.00	6067.	714.5	0.	4031.8	174.76	2025.6	13528.
	232.4	75.3	138.2	356.4	4.778	3.7006	24801.
	5253.	1033.3	544.4	5250.	105.11	.3534	17503.
	3605.5	375..	373.1	3600.0	74.14	1504.1	757.0
	4325.	531.1	448.4	4320.	83.95	-677.9	330.
	0.	-1985.7	1607.5	0.	0.	11.907	0.
	0.	124.0	191.8	0.	0.	16.000	0.
	47.970	-7.5	214.18	1.2518	1.2500	12.000	252.00
	24.952	-6..	1.0014	3.00-6	3.0000	12.000	30.00
	29.950	-5.3	6.6738	4.0053	4.0000	12.000	123.50
	24128.	414.75	.9361				
	851.1	162.49					
	92.41	176.20					
	8235.	47805.					
104.00	4905.	319..	0.	4055.3	97.41	1815.5	14015.
	739.1	241.1	154.1	846.3	14.576	2.2369	23673.
	5257.	1031.1	540.5	5250.	104.38	1.0000	13072.
	3604.7	817.3	370.4	3600.0	71.58	1510.3	1553.2
	4325.	574.5	445.2	4320.	85.88	170.5	1733.
	0.	-851.5	1562.9	0.	0.	11.922	0.
	0.	107.2	413.3	0.	0.	16.000	0.
	47.940	-6.7	204.75	1.2516	1.2500	12.000	252.00
	24.967	-4.73	1.0012	3.0039	3.0000	12.000	30.00
	29.956	-4.3	7.0000	4.0045	4.0000	12.000	123.50
	24709.	429.31	.9706				
	866.5	156.35					
	94.12	128.53					
	8335.	47936.					
108.00	4187.	349.5	0.	4119.0	82.95	1777.7	14109.
	967.1	97.3	48.8	939.4	19.157	1.9174	23022.
	5252.	1027.5	541.2	5250.	104.04	1.0000	18225.
	3601.5	813.5	371.1	3600.0	71.34	1405.4	1757.6
	4322.	523.2	445.3	4320.	85.51	221.9	1723.
	0.	-69..	1501.3	0.	0.	12.028	0.
	0.	-27.7	439.4	0.	0.	16.000	0.
	47.979	-2.7	203.79	1.2505	1.2500	12.000	252.00
	24.989	-1.51	1.0004	3.0013	3.0000	12.000	30.00
	29.997	-1.3	7.0000	4.0017	4.0000	12.000	123.50
	25269.	432.35	.9979				
	880.7	170.07					
	95.58	130.97					
	8522.	48152.					

112.00	4093.	442.2	0.	4159.4	82.05	1847.1	13361.
	838.8	36.0	25.1	741.2	15.313	1.7381	22930.
	5249.	1031.4	543.1	5250.	105.23	1.0000	13121.
	3599.5	813.0	372.5	3600.0	72.15	1387.4	1457.8
	4320.	624.8	446.7	4320.	86.59	-52.0	1416.
	0.	66.4	1468.5	0.	0.	12.040	0.
	0.	-47.5	364.5	0.	0.	16.000	0.
	48.006	.3	209.58	1.2498	1.2500	12.000	252.00
	25.004	.57	.9999	2.9995	3.0000	12.000	30.00
	30.002	.7	7.0000	3.9997	4.0000	12.000	123.60
	25813.	473.97	1.0099				
	895.2	173.65					
	97.23	133.42					
	8831.	48318.					
116.00	4225.	468.2	0.	4164.1	85.08	1891.8	13371.
	707.6	57.0	54.0	701.1	14.246	1.8519	22937.
	5249.	1032.3	543.4	5250.	105.58	1.0000	13035.
	3599.5	819.5	372.7	3600.0	72.47	1417.2	1310.4
	4320.	625.3	447.1	4320.	86.96	-150.9	1309.
	0.	-61.9	1460.2	0.	0.	12.004	0.
	0.	-5.5	327.6	0.	0.	16.000	0.
	48.006	.5	212.51	1.2498	1.2500	12.000	252.00
	25.003	.43	.9999	2.9996	3.0000	12.000	30.00
	30.003	.4	7.0000	3.9996	4.0000	12.000	123.60
	26370.	491.77	1.0040				
	910.1	177.30					
	98.32	135.95					
	9193.	48455.					
120.00	4255.	439.5	0.	4145.5	85.31	1867.8	13900.
	711.3	92.1	76.2	729.6	14.253	1.8405	23012.
	5250.	1031.7	542.7	5250.	105.28	1.0000	13045.
	3600.2	819.2	372.1	3600.0	72.19	1437.6	1330.4
	4320.	625.7	446.6	4320.	86.63	-58.9	1339.
	0.	-109.2	1458.0	0.	0.	11.985	0.
	0.	13.3	345.1	0.	0.	16.000	0.
	47.997	-.3	211.85	1.2501	1.2500	12.000	252.00
	24.998	-.24	1.0001	3.0002	3.0000	12.000	30.00
	29.999	-.2	7.0000	4.0002	4.0000	12.000	123.60
	26922.	509.09	.9977				
	925.2	180.34					
	100.43	138.51					
	9542.	48500.					

PAGE 27 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

124.00	4131.	415.1	0.	4134.3	83.52	1847.3	13351.
	779.4	37.7	72.8	731.1	15.358	1.2151	22959.
	5251.	1031.7	542.2	5250.	104.97	1.0000	19035.
	3600.4	913.7	371.8	3600.0	71.31	1473.1	1475.5
	4320.	524.7	446.2	4320.	85.29	30.4	1484.
	0.	-47.7	1457.3	0.	0.	11.992	0.
	0.	10.7	368.9	0.	0.	16.000	0.
	47.995	-.[illegible]	210.59	1.2501	1.2500	12.000	252.00
	24.997	-.40	1.0001	3.0003	3.0000	12.000	30.00
	29.997	-.[illegible]	7.0000	4.0104	4.0000	12.000	129.60
	27474.	527.57	.9973				
	940.0	194.57					
	102.04	141.07					
	9970.	49719.					
128.00	4126.	419.3	0.	4137.5	82.41	1844.9	13350.
	793.7	94.7	61.7	790.2	15.857	1.3704	22913.
	5250.	1031.7	542.3	5250.	104.96	1.0000	19038.
	3600.1	913.1	371.9	3600.0	71.30	1422.2	1434.6
	4320.	524.7	446.3	4320.	95.28	31.5	1430.
	0.	11.1	1448.6	0.	0.	12.003	0.
	0.	-3.7	371.2	0.	0.	16.000	0.
	47.999	-.7	210.46	1.2500	1.2500	12.000	252.00
	24.999	-.11	1.0000	3.0001	3.0000	12.000	30.00
	29.999	-.1	7.0000	4.0101	4.0000	12.000	129.60
	28024.	546.31	.9999				
	954.9	189.17					
	103.52	143.54					
	10193.	49977.					
132.00	4130.	430.9	0.	4144.2	82.52	1852.5	13342.
	777.7	75.1	58.6	771.7	15.558	1.2610	22911.
	5250.	1071.7	542.6	5250.	105.02	1.0000	19035.
	3599.9	918.3	372.1	3600.0	72.01	1419.7	1447.4
	4320.	524.3	445.4	4320.	85.42	-4.8	1442.
	0.	14.2	1446.8	0.	0.	12.005	0.
	0.	-6.0	361.8	0.	0.	16.000	0.
	48.001	.1	210.99	1.2500	1.2500	12.000	252.00
	25.001	.11	1.0000	2.9999	3.0000	12.000	30.00
	30.001	.1	7.0000	3.9999	4.0000	12.000	129.60
	28574.	556.05	1.0011				
	959.5	131.31					
	105.21	146.07					
	10539.	49924.					

136.00	4152.	433.4	0.	4145.3	93.10	1956.3	13931.
	751.3	73.7	62.3	750.6	15.279	1.3769	22926.
	5250.	1031.7	542.6	5250.	105.08	1.0000	13076.
	3599.9	813.5	372.1	3600.0	72.06	1423.5	1429.0
	4320.	527.1	446.5	4320.	86.47	-13.2	1429.
	0.	-5.5	1447.2	0.	0.	12.000	0.
	0.	-.3	357.2	0.	0.	16.000	0.
	48.001	.1	211.26	1.2500	1.2500	12.000	252.00
	25.001	.03	1.0000	2.9999	3.0000	12.000	30.00
	30.001	.1	7.0000	3.9999	4.0000	12.000	129.60
	29124.	594.73	1.0004				
	984.4	195.42					
	105.91	149.53					
	10882.	49017.					
140.00	4155.	429.2	0.	4143.8	93.15	1854.2	13935.
	762.1	83.2	65.2	754.6	15.247	1.3876	22930.
	5250.	1031.7	542.5	5250.	105.03	1.0000	13078.
	3600.0	813.3	372.0	3600.0	72.02	1426.2	1438.6
	4320.	625.0	446.4	4320.	86.42	-6.5	1441.
	0.	-12.3	1447.5	0.	0.	11.998	0.
	0.	2.4	359.7	0.	0.	16.000	0.
	48.000	-.1	211.15	1.2500	1.2500	12.000	252.00
	25.000	-.02	1.0000	3.0000	3.0000	12.000	30.00
	30.000	-.0	7.0000	4.0000	4.0000	12.000	129.60
	29674.	593.37	.9997				
	999.3	199.04					
	108.40	151.10					
	11223.	49097.					
144.00	4147.	425.3	0.	4142.2	92.92	1851.6	13941.
	770.0	84.7	64.7	771.3	15.336	1.3845	22923.
	5250.	1031.7	542.5	5250.	104.98	1.0000	13083.
	3600.0	819.4	372.0	3600.0	71.99	1425.5	1451.0
	4320.	624.2	446.4	4320.	86.38	4.9	1452.
	0.	-4.3	1447.2	0.	0.	11.999	0.
	0.	1.4	362.8	0.	0.	16.000	0.
	47.999	-.1	210.99	1.2500	1.2500	12.000	252.00
	25.000	-.03	1.0000	3.0000	3.0000	12.000	30.00
	30.000	-.0	7.0000	4.0000	4.0000	12.000	129.60
	30224.	522.17	.9997				
	1014.1	202.56					
	110.00	153.52					
	11562.	49156.					

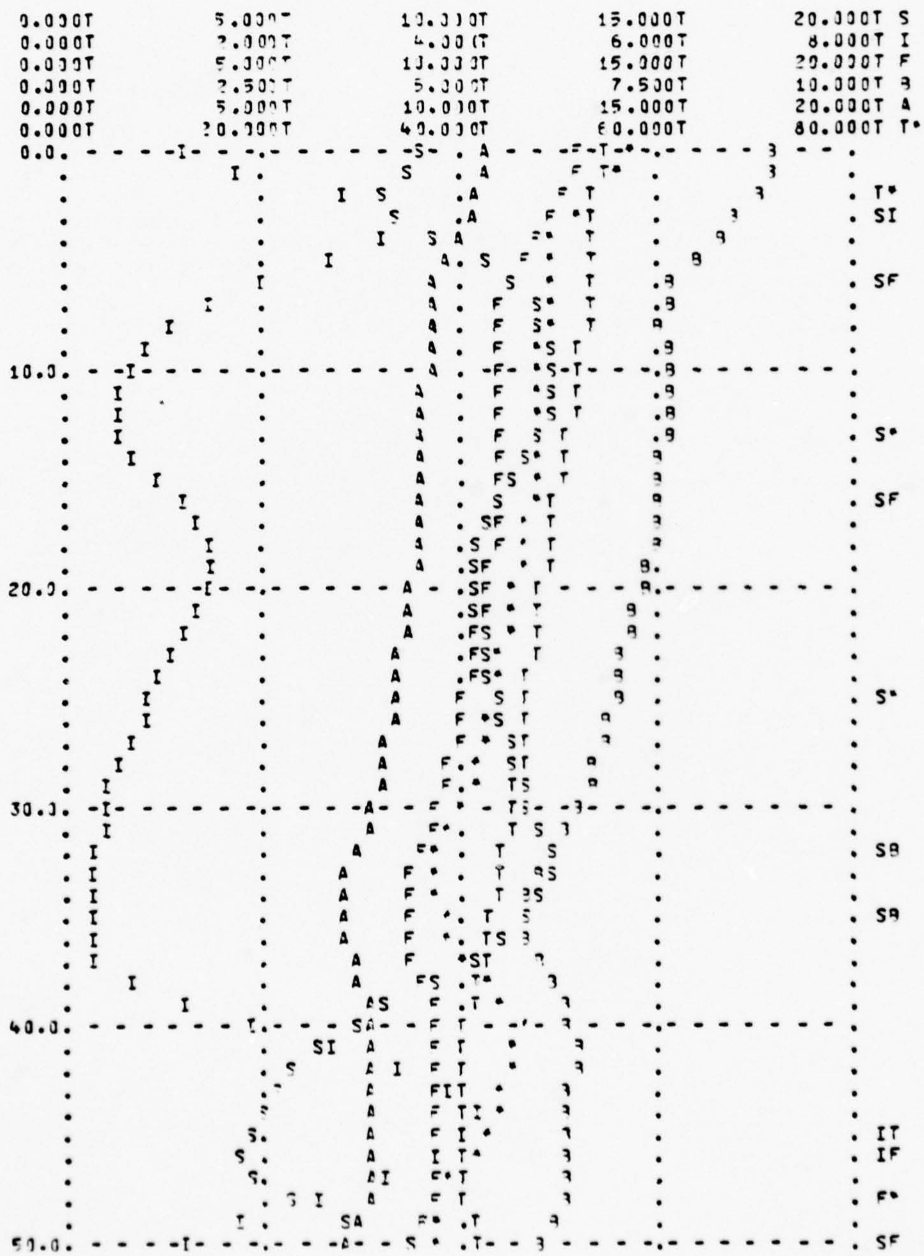
PAGE 29 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

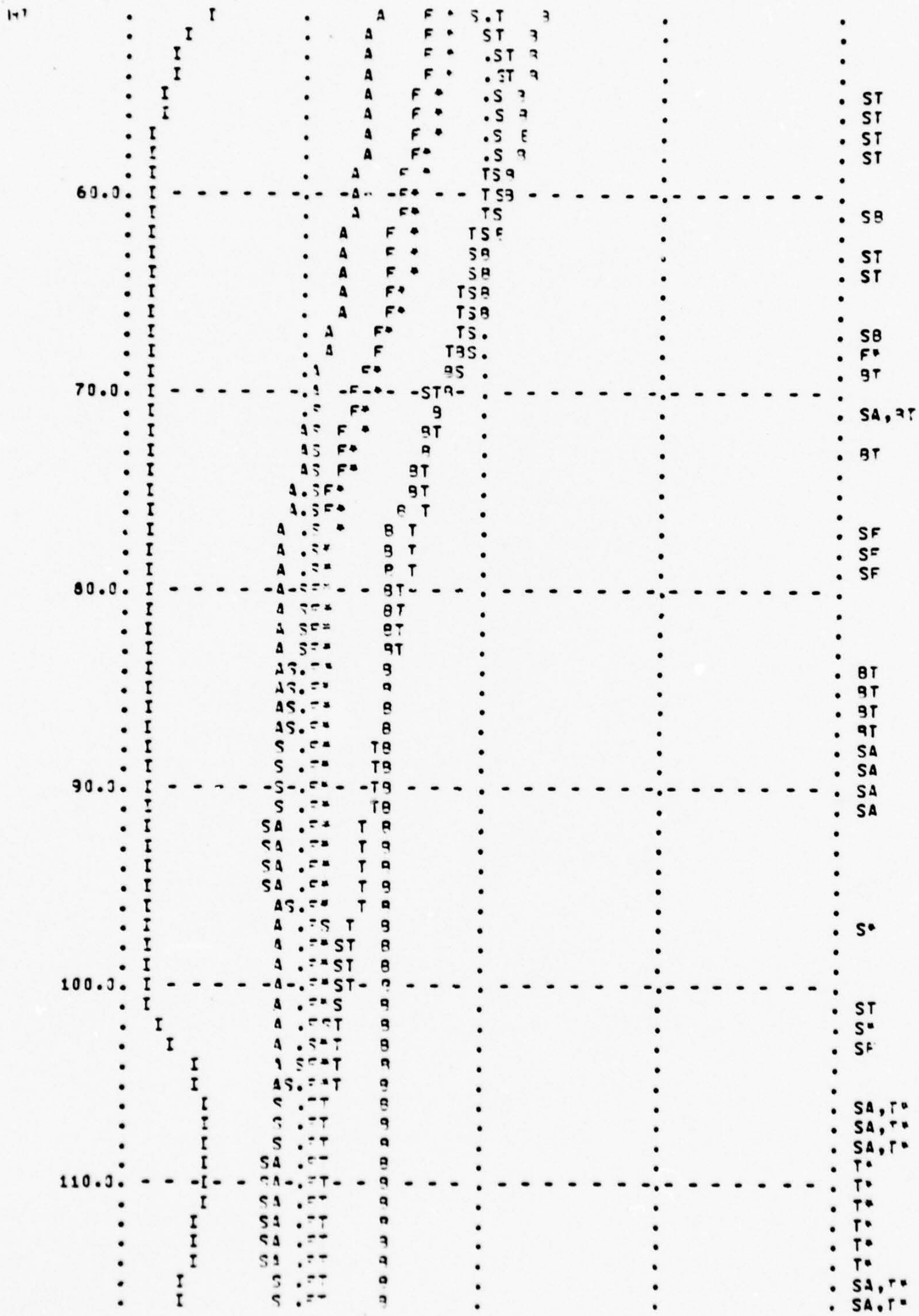
143.33	4140.	[illegible]	0.	4142.5	32.78	1851.5	13342.
	772.9	[illegible]	63.2	772.3	15.454	1.8785	22919.
	5250.	1039.[illegible]	542.5	5250.	104.98	1.0000	13035.
	3600.0	313.[illegible]	372.0	3600.0	71.99	1424.0	1451.8
	4320.	624.[illegible]	446.4	4320.	86.38	4.5	1451.
	0.	2.5	1446.7	0.	0.	12.000	0.
	0.	-.[illegible]	363.0	0.	0.	16.000	0.
	48.000	-.0	210.98	1.2500	1.2500	12.000	252.00
	25.000	-.[illegible]	1.0000	3.0000	3.0000	12.000	90.00
	30.000	-.[illegible]	7.0000	-.0000	4.0000	12.000	139.50
	30775.	541.01	1.0000				
	1028.9	295.2[illegible]					
	111.59	156.1[illegible]					
	11901.	49232.					

- -

PAGE 30 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

JOB(1)=S JOB(2)=I JOB(3)=F JOB(4)=B JOB(5)=A TOTFOR=T
FORSIZ=*

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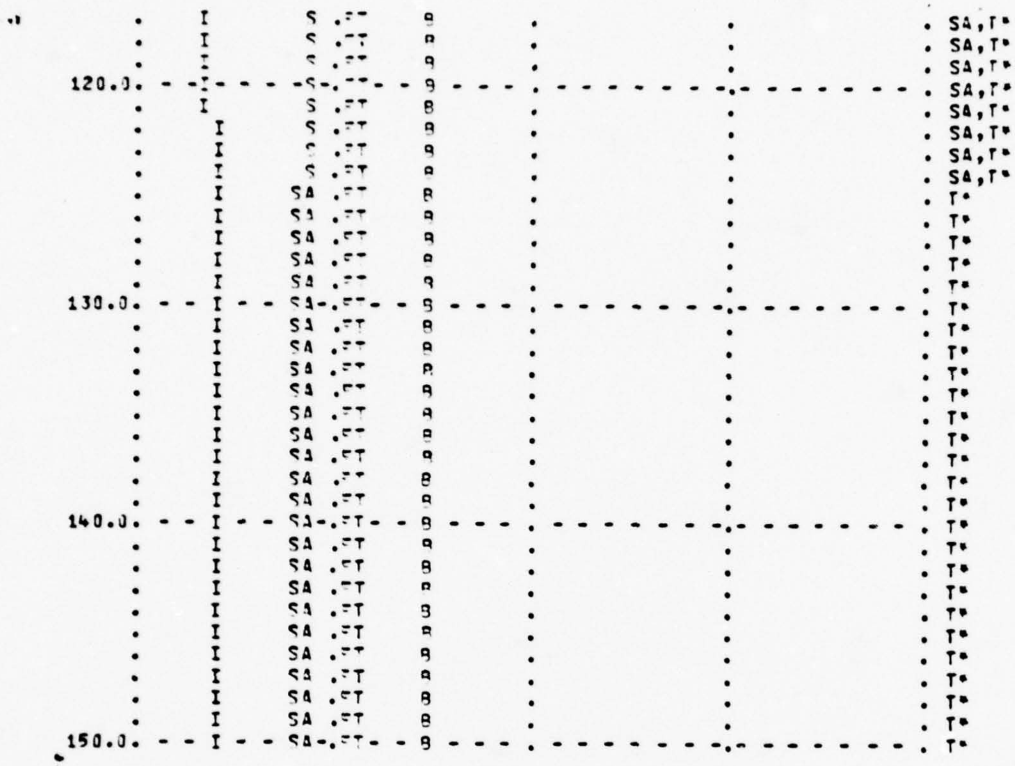
110.0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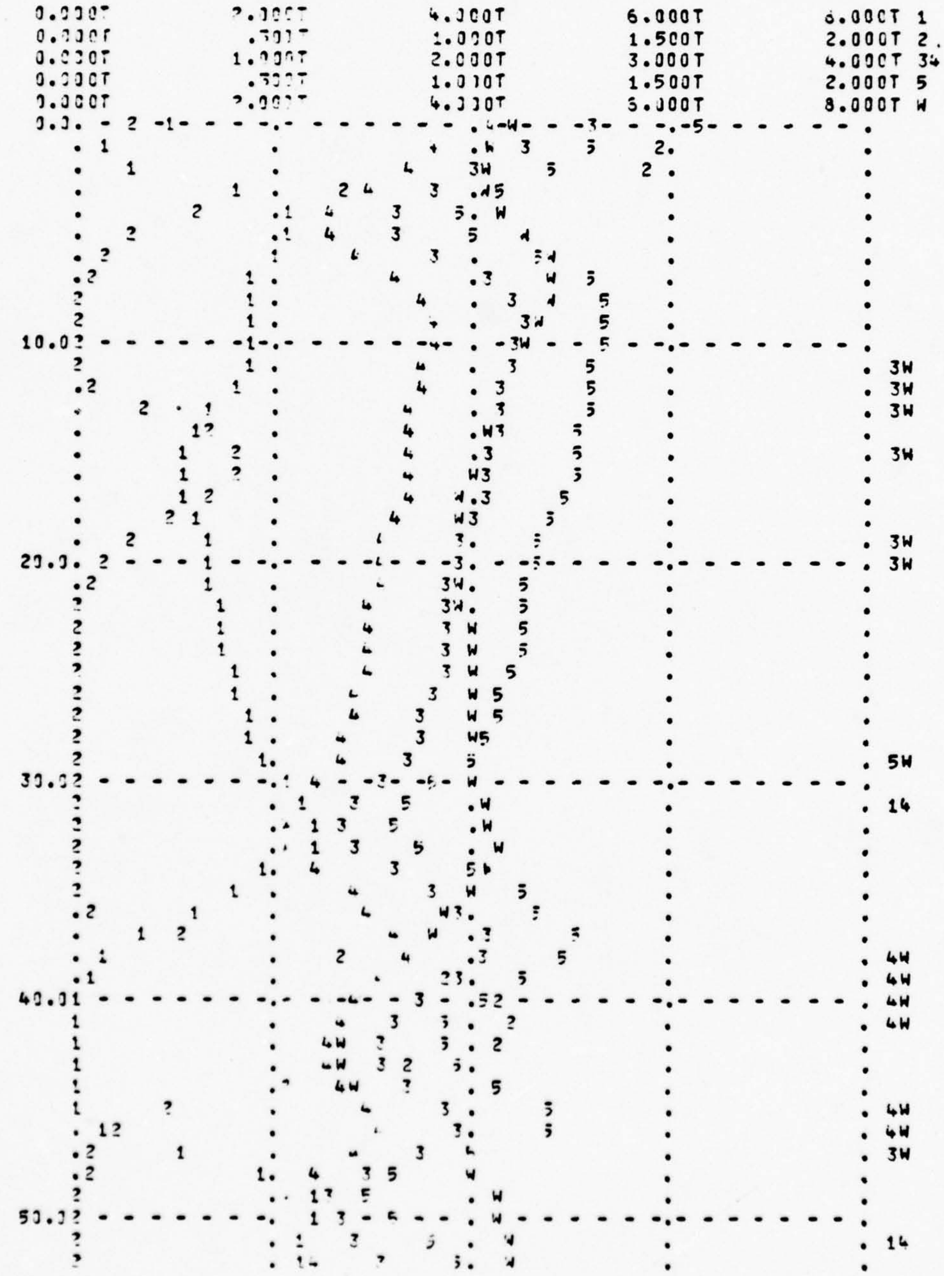
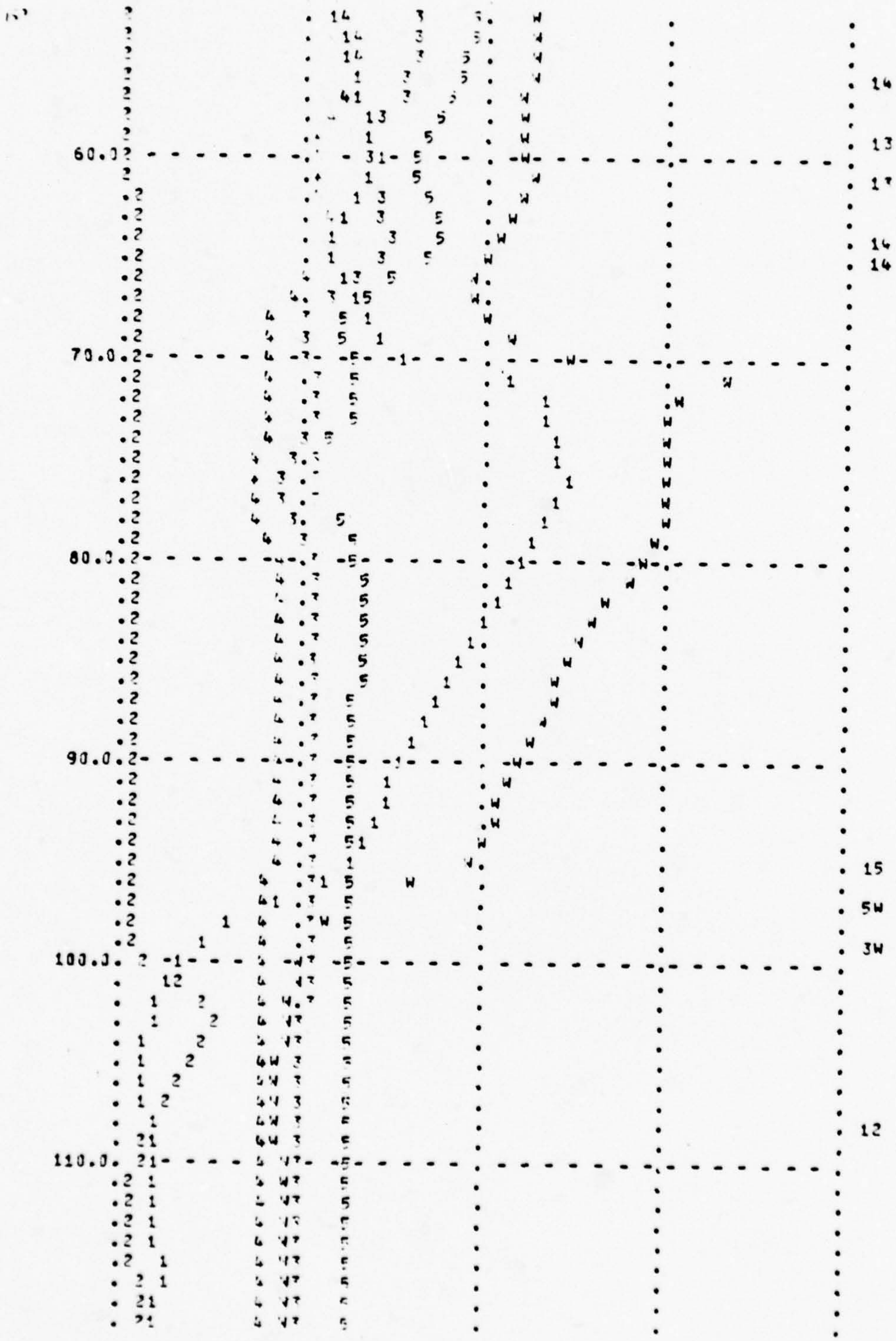
130.0
140.0
150.0

PAGE 31 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W

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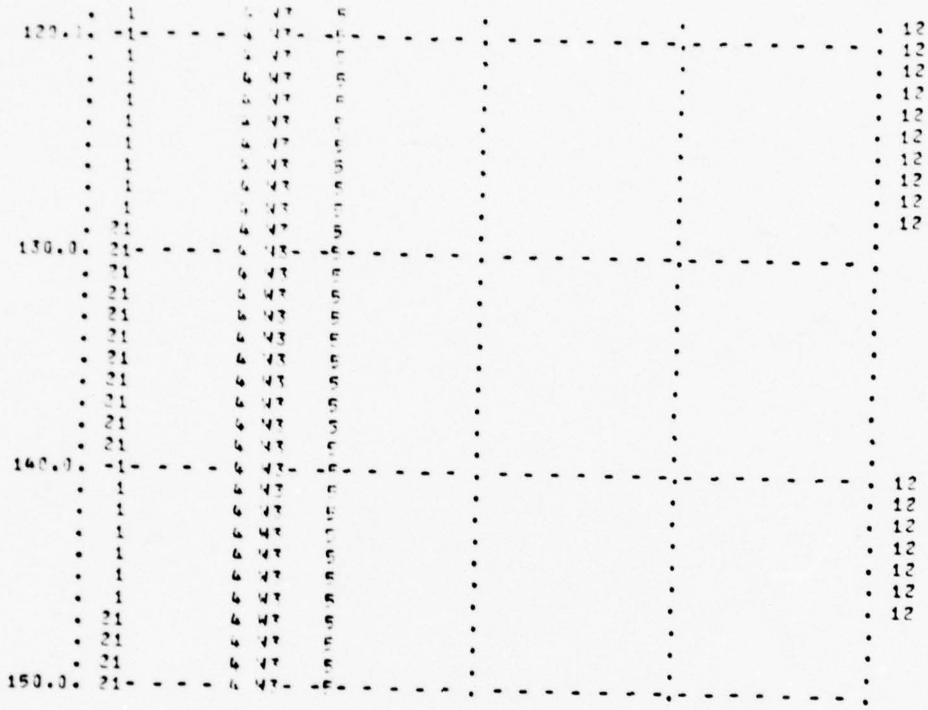
110.0
14
13
14
14
15
5W
3W
12


120.0
130.0
140.0
150.0

PAGE 32 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

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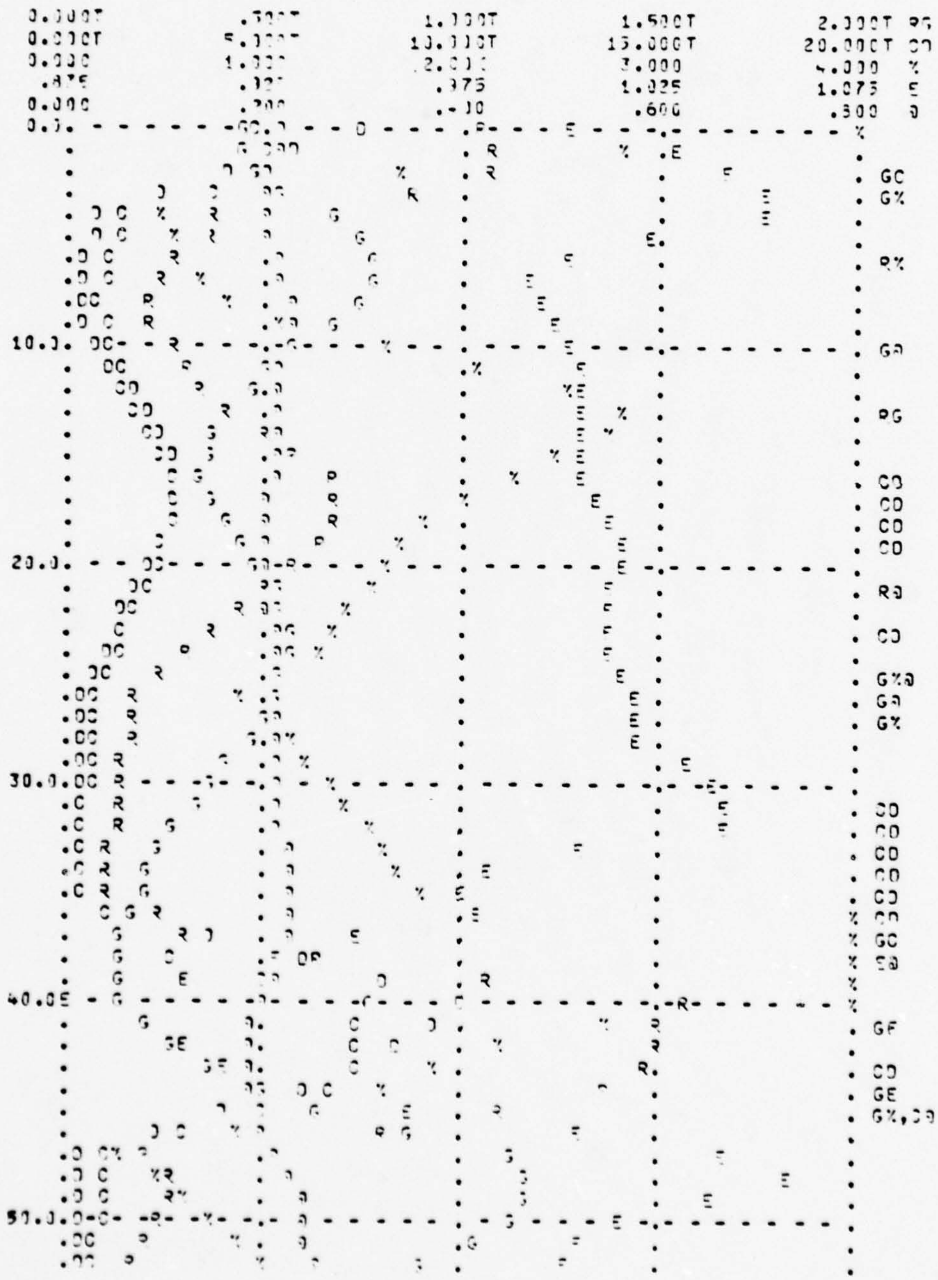

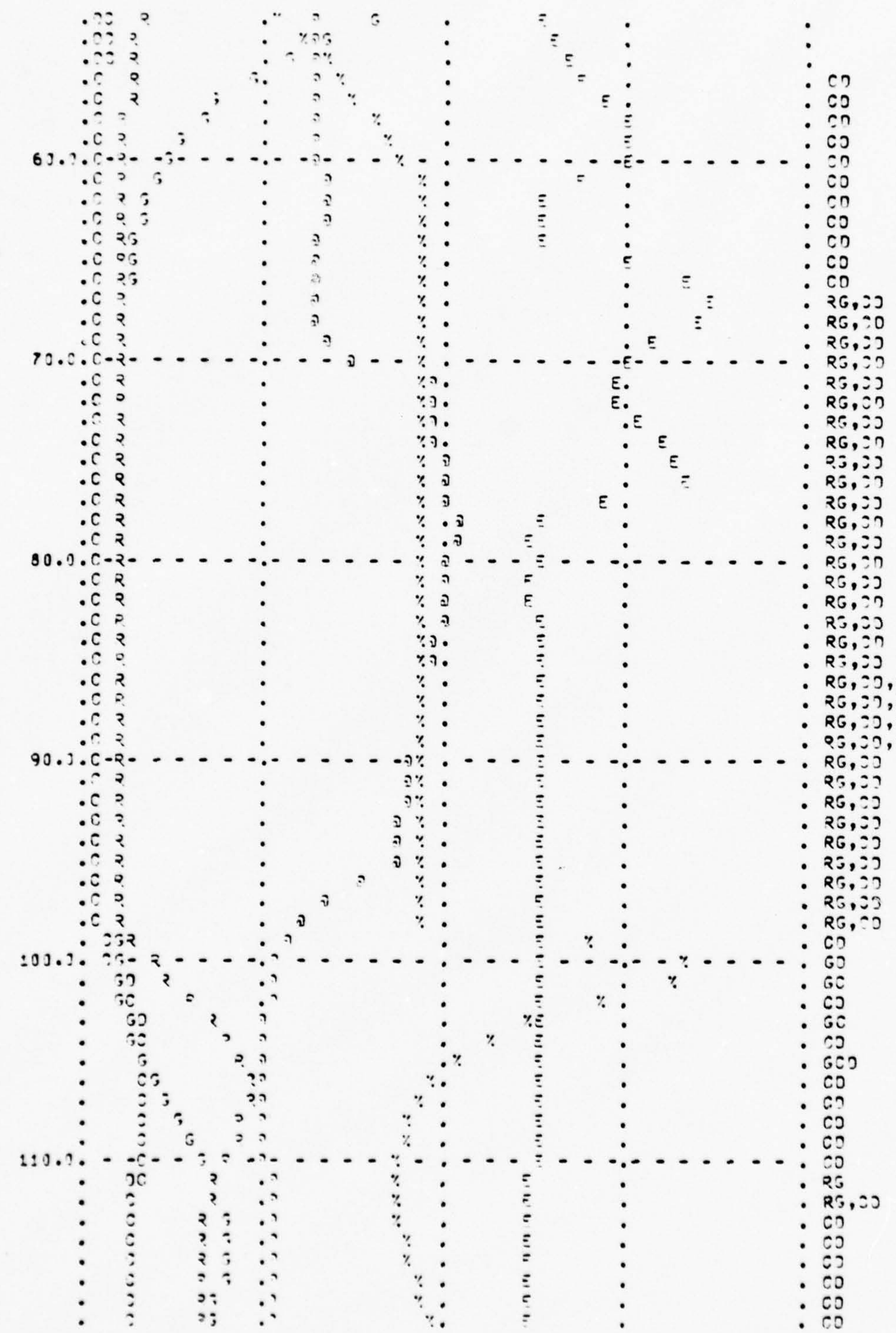
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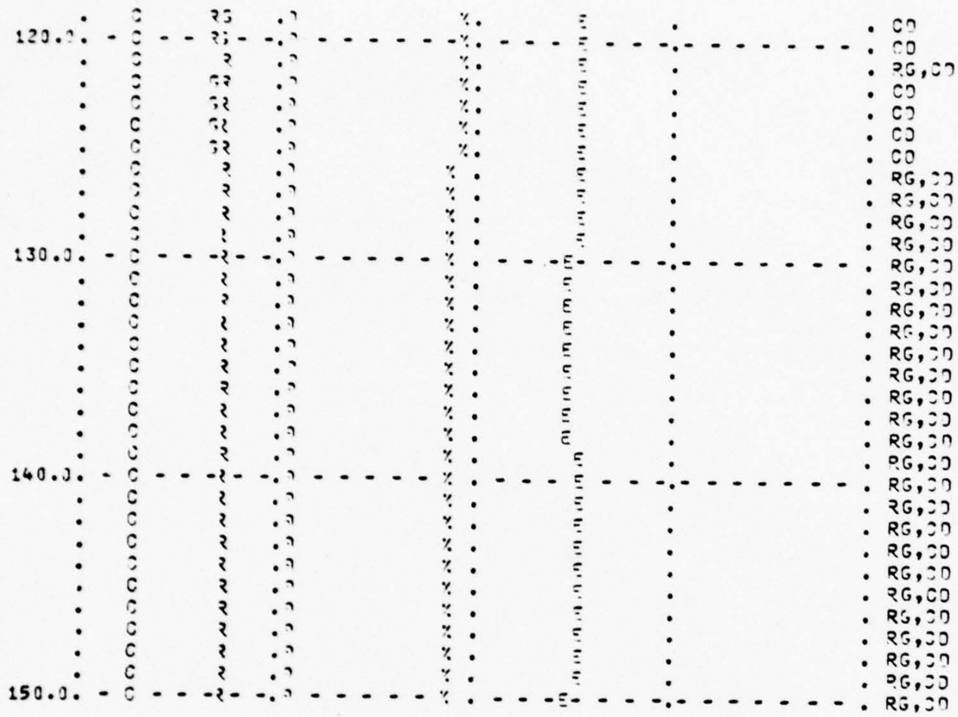
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140.0
150.0

155

PAGE 33 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

CRATIO(3)=1 DCRATI(3)=2 CRATIO(4)=3 DCRATI(4)=4 CRATIO(5)=5
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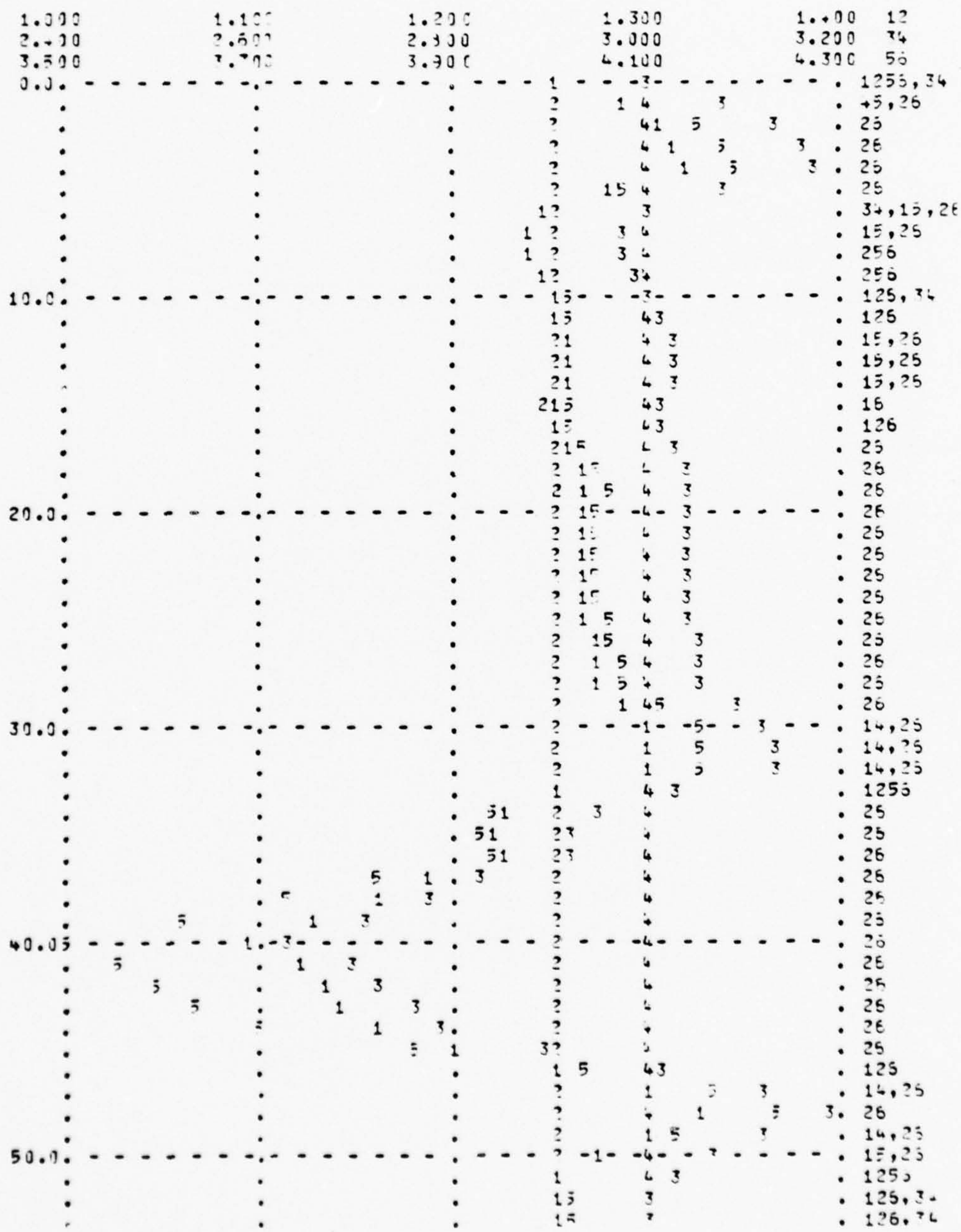

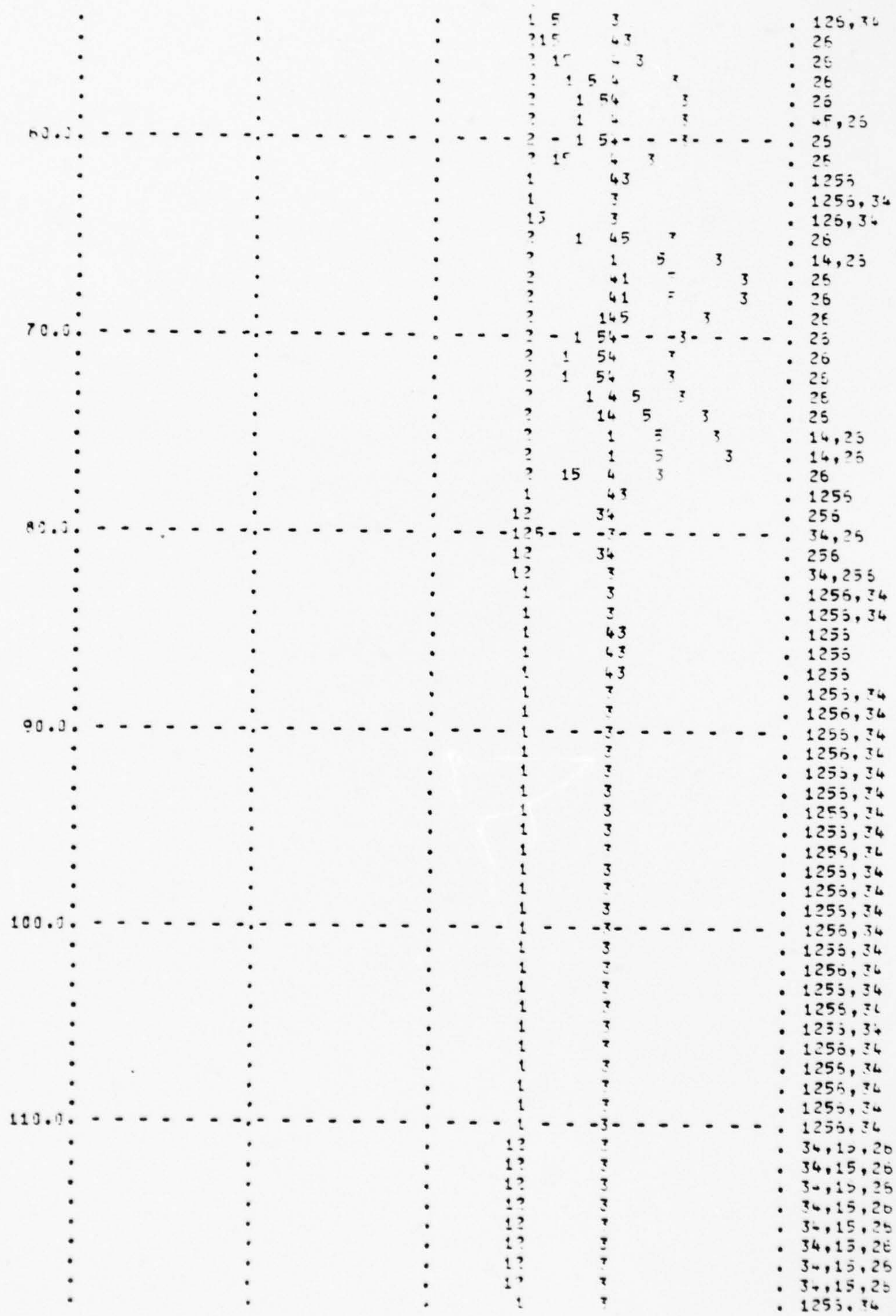
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80.0
90.0
100.0
110.0

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 130.0. - - - - - - - -.- - - - - - - - . - - -12 - - -3- - - - - - - - . 34,15,2
       .                .                .      12      3                . 34,15,2
       .                .                .      12      3                . 34,15,2
       .                .                .      12      3                . 34,15,2
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```

APPENDIX G

ATTRITION LISTINGS

APPENDIX G

Attrition Listings

The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

PAGE 16 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

G -- ATTRITION

CHANGES FOR RERUN -

ORIGINAL H4	0.000	0.000	0.000	0.000	0.000
PRESENT H4	.500	.500	.500	.500	.500

```
PAGE  17  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

  TIME       JOB     TRNG     NEED   CFORCE      ATT     WIND  OTMFOR
               2        2        2        2        2    TRINS  TOTFOR
               3        3        3        3        3      CAP  TODFOR
               4        4        4        4        4   TONEED   DSIZE
               5        5        5        5        5    FORCE  DDSIZE
            HFPP   OFDST      PATT   CRATIO   DCRATI      ATJ  MHOURS
               2        2     PREC        2        2        2       2
               3        3   TRNGFC        3        3        3       3
               4        4    FOEFC        4        4        4       4
               5        5     TOEL        5        5        5       5
           SCOST   RCOST      TRAV
           PCOST   ACOST
           TCOST  TOTCOS
           UCOST   OCOST
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  E-00      E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-03     E-00     E-00     E-00    E 03
            E-00    E-00      E-00     E-00     E-00     E-00    E-00
            E-00    E-00      E-00     E-00     E-00     E-00    E 03
            E 05    E 05      E-00
            E 06    E 05
            E 06    E 05
            E 05    E 05
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  0.00    3425.0  353.32        0.   3425.0    58.50   1540.8  11515.
           640.0   69.64     52.80    640.0   12.900   1.8800  13055.
          4375.0  958.35    452.08   4375.0    87.50   1.0000  15040.
          3000.0  582.01    310.00   3000.0   50.000   1186.9  1203.2
          3600.0  520.90    372.00   3600.0    72.00     0.00  1203.2
              0.    0.00    1203.2       0.       0.   12.000      0.
              0.    0.00    300.80       0.       0.   16.000      0.
          48.000   -.000    211.12   1.2500   1.2500   12.000  210.00
          25.000   -.000    1.0000   3.0000   3.0000   12.000  75000.
          30.000   -.000    7.0000   4.0000   4.0000   12.000  103.00
              0.    0.00    1.0000
            0.00    0.00
              0.      0.
              0.      0.
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PAGE 18 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

4.00	3425.0	353.33	0.	3425.0	102.75	1540.8	11515.
	640.0	63.6	52.80	640.0	19.200	1.8800	13065.
	4375.0	853.3	452.08	4375.0	131.25	1.0000	15040.
	3000.0	582.00	310.00	3000.0	90.000	1186.9	1203.2
	3600.0	520.30	372.00	3600.0	108.00	.00	1203.2
	0.	.00	1203.2	0.	0.	12.000	0.
	0.	.00	300.80	0.	0.	16.000	0.
	48.000	.000	211.12	1.2500	1.2500	12.000	210.00
	25.000	.000	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.000	7.0000	4.0000	4.0000	12.000	103.00
	453.	15.54	1.0000				
	12.33	3.01					
	1325.	2095.					
	283.	1998.					
8.00	2634.5	17.63	0.	2909.5	77.34	1490.6	12103.
	942.2	304.27	252.08	1128.2	27.143	2.2643	13553.
	4333.6	933.30	511.32	4375.0	124.95	1.0133	15013.
	2969.0	741.23	352.78	3000.0	95.532	1532.6	2133.4
	3571.1	564.73	416.58	3600.0	102.88	767.28	2700.0
	0.	225.0	1532.7	0.	0.	11.715	0.
	0.	185.99	533.35	0.	0.	16.000	0.
	48.458	41.379	218.43	1.2392	1.2500	12.000	210.00
	25.261	31.011	.9308	2.9690	3.0000	12.000	75000.
	30.243	28.937	7.0934	3.9679	4.0000	12.000	103.00
	903.	37.02	1.0046				
	24.49	7.30					
	2519.	4164.					
	563.	3792.					
12.00	2000.7	144.30	0.	2794.6	57.34	1497.3	12227.
	1289.8	150.95	74.02	1252.4	37.287	1.8206	19300.
	4372.0	937.35	487.69	4375.0	125.38	1.0348	15022.
	2998.2	745.95	334.13	3000.0	95.672	1298.0	2343.3
	3596.5	566.83	402.17	3600.0	103.97	691.44	2293.1
	0.	593.90	1607.7	0.	0.	12.029	0.
	0.	-37.47	587.08	0.	0.	16.000	0.
	48.033	3.029	220.93	1.2491	1.2500	12.000	210.00
	25.015	1.771	.9992	2.9982	3.0000	12.000	75000.
	30.029	3.449	7.2438	3.9962	4.0000	12.000	103.00
	1350.	67.35	1.0006				
	36.32	11.47					
	3893.	6253.					
	895.	5411.					

16.00	2211.1	323.62	0.	2925.4	55.83	1625.1	11995.
	1104.3	47.89	24.76	1020.9	32.379	1.5896	13519.
	4369.3	335.75	495.65	4375.0	130.06	1.0000	14321.
	2995.6	742.05	339.66	3000.0	59.188	1268.3	1565.8
	3594.7	558.47	407.79	3600.0	107.03	140.92	1790.9
	0.	514.27	1650.0	0.	0.	12.067	0.
	0.	-83.44	466.45	0.	0.	16.000	0.
	48.074	6.742	229.18	1.2481	1.2500	12.000	210.00
	25.037	4.437	.9985	2.9956	3.0000	12.000	75000.
	30.044	5.293	7.0000	3.9941	4.0000	12.000	108.00
	1791.	95.22	1.0210				
	48.79	15.50					
	5215.	8500.					
	1335.	5997.					
20.00	2575.5	379.47	0.	2355.4	90.91	1686.2	11315.
	852.8	61.10	63.51	840.2	25.093	1.9136	13996.
	4370.3	344.73	497.83	4375.0	132.16	1.0000	14571.
	2996.4	750.32	341.73	3000.0	30.512	1312.3	1564.8
	3596.7	572.54	409.25	3600.0	103.77	-150.37	1553.1
	0.	179.33	1703.5	0.	0.	12.011	0.
	0.	-22.53	391.20	0.	0.	16.000	0.
	48.051	4.577	232.56	1.2487	1.2500	12.000	210.00
	25.030	3.645	.9989	2.9964	3.0000	12.000	75000.
	30.028	3.344	7.0000	3.9963	4.0000	12.000	108.00
	2240.	117.21	1.0081				
	62.10	19.32					
	5624.	10894.					
	1931.	8525.					
24.00	2854.5	328.53	0.	2827.1	35.85	1666.5	11851.
	846.0	126.25	108.25	876.3	25.444	1.3640	13051.
	4374.5	143.73	496.04	4375.0	131.57	1.0000	14675.
	2999.8	749.42	340.03	3000.0	30.221	1352.6	1561.5
	3599.4	572.15	408.31	3600.0	108.26	-49.14	1593.7
	0.	-27.35	1741.9	0.	0.	11.968	0.
	0.	30.30	415.37	0.	0.	16.000	0.
	48.006	.531	230.14	1.2498	1.2500	12.000	210.00
	25.002	.235	.9999	2.9998	3.0000	12.000	75000.
	30.005	.607	7.0000	3.9993	4.0000	12.000	108.00
	2595.	137.85	.9963				
	75.54	24.37					
	8067.	13296.					
	2285.	3903.					

28.00	2796.4	289.97	0.	2900.6	93.19	1633.1	11942.
	947.1	140.45	104.66	957.0	29.278	1.9320	13033.
	4375.9	341.20	494.91	4375.0	130.64	1.0000	14743.
	3000.5	747.27	339.31	3000.0	93.587	1346.2	1329.9
	3600.5	570.55	407.35	3600.0	107.50	91.79	1345.6
	0.	14.20	1753.8	0.	0.	11.982	0.
	0.	19.89	457.46	0.	0.	16.000	0.
	47.991	-.801	227.11	1.2502	1.2500	12.000	210.00
	24.995	-.520	1.0002	3.0006	3.0000	12.000	75000.
	29.996	-.520	7.0000	4.0006	4.0000	12.000	103.00
	3153.	150.55	.9950				
	88.73	28.77					
	9492.	15617.					
	2593.	11123.					
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32.00	2723.2	298.75	0.	2903.1	91.35	1630.9	11957.
	983.8	117.23	84.07	992.3	29.539	1.8649	13932.
	4375.1	340.51	495.21	4375.0	130.70	1.0000	14750.
	3000.1	746.80	339.57	3000.0	89.620	1326.3	1344.0
	3600.1	570.35	407.49	3600.0	107.54	81.09	1335.5
	0.	79.94	1754.4	0.	0.	12.007	0.
	0.	-6.54	461.01	0.	0.	16.000	0.
	47.998	-.141	226.66	1.2500	1.2500	12.000	210.00
	24.999	-.100	1.0000	3.0001	3.0000	12.000	75000.
	29.999	-.109	7.0000	4.0001	4.0000	12.000	103.00
	3610.	184.57	1.0001				
	101.77	33.17					
	10897.	17922.					
	3095.	12219.					
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36.00	2751.9	320.60	0.	2913.8	92.53	1646.4	11921.
	957.9	102.43	78.08	946.4	29.729	1.8506	13013.
	4374.5	341.71	495.93	4375.0	131.20	1.0000	14735.
	2999.6	747.53	340.10	3000.0	93.952	1322.1	1772.7
	3599.6	570.92	408.02	3600.0	107.96	5.46	1752.4
	0.	61.97	1757.0	0.	0.	12.010	0.
	0.	-11.51	443.18	0.	0.	16.000	0.
	48.005	.539	227.73	1.2499	1.2500	12.000	210.00
	25.003	.407	.9999	2.9996	3.0000	12.000	75000.
	30.003	.371	7.0000	3.9996	4.0000	12.000	103.00
	4065.	209.15	1.0025				
	114.37	37.51					
	12303.	20243.					
	3514.	13213.					

40.00	2803.3	325.72	0.	2815.3	54.20	1654.1	11301.
	927.2	107.23	84.91	925.5	27.349	1.5752	13354.
	4374.6	342.44	496.08	4375.0	131.40	1.0000	14715.
	2999.7	748.31	340.19	3000.0	30.104	1329.4	1733.6
	3599.7	571.41	408.18	3600.0	108.13	-23.70	1733.3
	0.	11.37	1762.0	0.	0.	12.001	0.
	0.	-1.62	434.66	0.	0.	16.000	0.
	48.004	.372	228.26	1.2499	1.2500	12.000	210.00
	25.002	.272	.9999	2.9997	3.0000	12.000	75000.
	30.002	.290	7.0000	3.9997	4.0000	12.000	108.00
	4522.	230.37	1.0010				
	128.08	41.92					
	13721.	22582.					
	3933.	14120.					

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44.00	2917.9	318.37	0.	2910.1	84.56	1651.0	11309.
	928.5	115.44	90.00	932.8	27.355	1.8909	13359.
	4375.0	342.30	495.65	4375.0	131.29	1.0000	14716.
	3000.0	749.19	340.00	3000.0	30.026	1333.9	1755.8
	3500.0	571.32	408.03	3600.0	108.03	-5.27	1750.1
	0.	-7.71	1765.4	0.	0.	11.996	0.
	0.	4.27	438.96	0.	0.	16.000	0.
	48.000	-.029	227.97	1.2500	1.2500	12.000	210.00
	25.000	-.022	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.003	7.0000	4.0000	4.0000	12.000	103.00
	4980.	253.61	.9994				
	141.31	46.31					
	15142.	24920.					
	4357.	14940.					

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48.00	2806.1	314.67	0.	2807.2	84.13	1646.9	11319.
	941.9	116.35	88.91	944.1	28.241	1.9657	13352.
	4375.1	341.97	495.71	4375.0	131.17	1.0000	14725.
	3000.1	747.83	339.91	3000.0	33.347	1332.4	1775.2
	3600.1	571.12	407.91	3600.0	107.94	11.84	1777.8
	0.	1.03	1765.9	0.	0.	11.998	0.
	0.	2.11	444.05	0.	0.	16.000	0.
	47.999	-.135	227.62	1.2500	1.2500	12.000	210.00
	24.999	-.103	1.0000	3.0001	3.0010	12.000	75000.
	29.999	-.337	7.0000	4.0101	4.0100	12.000	103.00
	5438.	275.55	.9994				
	154.50	50.75					
	16561.	27251.					
	4770.	15679.					

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52.00	2798.7	316.27	0.	2808.0	83.92	1647.0	11920.
	945.9	113.15	86.31	944.8	28.364	1.8773	13037.
	4375.0	341.91	495.77	4375.0	131.19	1.0000	14728.
	3000.0	747.85	339.96	3000.0	89.359	1330.0	1775.7
	3600.0	571.13	407.95	3600.0	107.95	8.75	1774.4
	0.	9.29	1765.7	0.	0.	12.001	0.
	0.	-1.11	443.93	0.	0.	16.000	0.
	48.000	-.011	227.60	1.2500	1.2500	12.000	210.00
	25.000	-.009	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.014	7.0000	4.0000	4.0000	12.000	103.00
	5895.	299.58	1.0001				
	157.67	55.17					
	17978.	29573.					
	5184.	15747.					
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56.00	2803.0	318.30	0.	2809.4	84.09	1649.0	11915.
	941.4	111.61	85.84	940.0	28.242	1.8764	13050.
	4374.9	342.07	495.86	4375.0	131.25	1.0000	14724.
	2999.9	747.93	340.02	3000.0	90.001	1329.7	1765.4
	3600.0	571.19	408.01	3600.0	108.00	-.63	1765.2
	0.	6.34	1765.9	0.	0.	12.001	0.
	0.	-1.37	441.61	0.	0.	16.000	0.
	48.001	.057	227.74	1.2500	1.2500	12.000	210.00
	25.000	.051	1.0000	2.9999	3.0000	12.000	75000.
	30.000	.043	7.0000	3.9999	4.0000	12.000	103.00
	6352.	322.71	1.0003				
	180.85	59.59					
	19395.	31910.					
	5600.	16953.					
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60.00	2809.0	319.25	0.	2809.4	84.28	1649.8	11913.
	937.9	112.43	86.80	937.9	28.142	1.9798	13065.
	4375.0	342.14	495.86	4375.0	131.27	1.0000	14722.
	3000.0	748.04	340.02	3000.0	90.014	1330.7	1753.1
	3600.0	571.23	408.02	3600.0	109.02	-3.22	1753.2
	0.	.39	1766.4	0.	0.	12.000	0.
	0.	-.04	440.77	0.	0.	16.000	0.
	48.000	.039	227.60	1.2500	1.2500	12.000	210.00
	25.000	.029	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.029	7.0000	4.0000	4.0000	12.000	103.00
	6810.	345.54	1.0001				
	194.05	64.00					
	20813.	34243.					
	6015.	17501.					
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64.00	2810.0	318.30	0.	2808.7	84.70	1649.3	11914.
	938.5	113.40	87.35	939.1	28.156	1.8814	13055.
	4375.0	342.11	495.83	4375.0	131.25	1.0000	14723.
	3000.0	748.02	340.00	3000.0	90.002	1331.2	1765.8
	3600.0	571.21	408.00	3600.0	108.00	-.41	1765.3
	0.	-1.33	1766.7	0.	0.	11.999	0.
	0.	.56	441.45	0.	0.	16.000	0.
	48.000	-.010	227.75	1.2500	1.2500	12.000	210.00
	25.000	-.008	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.003	7.0000	4.0000	4.0000	12.000	108.00
	7267.	368.53	.9999				
	207.25	68.42					
	22232.	36575.					
	6432.	17997.					

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68.00	2808.3	317.84	0.	2808.4	84.24	1648.8	11915.
	940.2	113.40	87.14	940.4	28.204	1.8806	13055.
	4375.0	342.05	495.82	4375.0	131.24	1.0000	14724.
	3000.0	747.98	339.99	3000.0	89.993	1330.9	1758.1
	3600.0	571.19	407.99	3600.0	107.99	1.54	1758.3
	0.	.17	1766.7	0.	0.	12.000	0.
	0.	.22	442.04	0.	0.	16.000	0.
	48.000	-.017	227.71	1.2500	1.2500	12.000	210.00
	25.000	-.013	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.012	7.0000	4.0000	4.0000	12.000	108.00
	7725.	391.55	.9999				
	220.44	72.84					
	23650.	38906.					
	6845.	18446.					

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72.00	2807.5	318.11	0.	2808.6	84.22	1648.9	11915.
	940.5	112.99	86.82	940.4	28.215	1.8796	13054.
	4375.0	342.03	495.83	4375.0	131.24	1.0000	14724.
	3000.0	747.99	340.00	3000.0	89.996	1330.6	1767.8
	3600.0	571.13	407.99	3600.0	107.99	.92	1757.6
	0.	1.10	1766.7	0.	0.	12.000	0.
	0.	-.17	441.95	0.	0.	16.000	0.
	48.000	-.001	227.71	1.2500	1.2500	12.000	210.00
	25.000	.003	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.001	7.0000	4.0000	4.0000	12.000	108.00
	8183.	414.53	1.0000				
	233.53	77.25					
	25068.	41237.					
	7262.	18851.					

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76.00	2808.1	318.42	0.	2808.7	84.24	1649.1	11915.
	939.9	112.37	86.80	939.7	29.198	1.8796	13035.
	4375.0	342.08	495.84	4375.0	131.25	1.0000	14723.
	3000.0	748.00	340.00	3000.0	90.001	1330.6	1755.6
	3600.0	571.20	408.00	3600.0	108.00	-.22	1755.5
	0.	.51	1766.7	0.	0.	12.000	0.
	0.	-.13	441.66	0.	0.	16.000	0.
	48.000	.009	227.73	1.2500	1.2500	12.000	210.00
	25.000	.005	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.005	7.0000	4.0000	4.0000	12.000	108.00
	8640.	437.51	1.0000				
	246.92	81.67					
	26486.	43559.					
	7677.	19219.					

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80.00	2808.8	318.47	0.	2808.7	84.27	1649.2	11915.
	939.5	112.35	86.93	939.5	29.186	1.8800	13155.
	4375.0	342.03	495.84	4375.0	131.25	1.0000	14723.
	3000.0	748.01	340.00	3000.0	90.002	1330.8	1755.3
	3600.0	571.20	408.00	3600.0	108.00	-.41	1755.4
	0.	-.05	1766.8	0.	0.	12.000	0.
	0.	.01	441.59	0.	0.	16.000	0.
	48.000	.004	227.74	1.2500	1.2500	12.000	210.00
	25.000	.003	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.007	7.0000	4.0000	4.0000	12.000	108.00
	9099.	460.47	1.0000				
	260.02	86.09					
	27904.	45901.					
	8092.	19551.					

- -

84.00	2808.8	318.39	0.	2808.6	84.26	1649.1	11915.
	939.7	113.07	86.99	939.7	29.190	1.8802	13055.
	4375.0	342.09	495.83	4375.0	131.25	1.0000	14723.
	3000.0	748.00	340.00	3000.0	90.000	1330.8	1755.7
	3600.0	571.20	408.00	3600.0	108.00	-.01	1755.8
	0.	-.19	1766.8	0.	0.	12.000	0.
	0.	.07	441.68	0.	0.	16.000	0.
	48.000	-.002	227.73	1.2500	1.2500	12.000	210.00
	25.000	-.001	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.001	7.0000	4.0000	4.0000	12.000	108.00
	9555.	493.44	1.0000				
	273.21	90.50					
	29322.	49232.					
	8507.	19852.					

- -

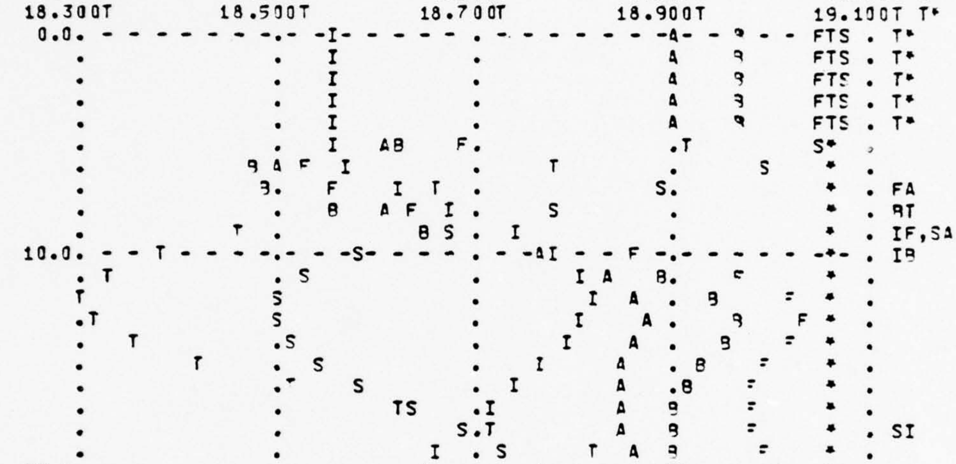
88.00	2808.6	318.27	0.	2808.6	84.26	1649.0	11915.
	939.9	113.07	86.95	939.9	28.196	1.8801	13055.
	4375.0	342.09	495.83	4375.0	131.25	1.0000	14723.
	3000.0	748.00	340.00	3000.0	59.399	1330.8	1757.0
	3600.0	571.20	408.00	3600.0	108.00	.20	1757.0
	0.	.03	1766.8	0.	0.	12.000	0.
	0.	.02	441.75	0.	0.	16.000	0.
	48.000	-.002	227.73	1.2500	1.2500	12.000	210.00
	25.000	-.002	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.002	7.0000	4.0000	4.0000	12.000	108.00
	10013.	506.41	1.0000				
	286.40	94.32					
	30741.	50554.					
	8923.	20124.					
92.00	2808.5	318.29	0.	2808.6	84.25	1649.1	11915.
	939.9	113.01	86.91	939.9	28.196	1.8799	13055.
	4375.0	342.09	495.83	4375.0	131.25	1.0000	14723.
	3000.0	748.00	340.00	3000.0	90.000	1330.7	1765.9
	3600.0	571.20	408.00	3600.0	108.00	.09	1765.9
	0.	.17	1766.8	0.	0.	12.000	0.
	0.	-.02	441.73	0.	0.	16.000	0.
	48.000	.002	227.73	1.2500	1.2500	12.000	210.00
	25.000	.002	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.002	7.0000	4.0000	4.0000	12.000	108.00
	10470.	529.38	1.0000				
	299.59	99.34					
	32159.	52895.					
	9339.	20370.					
96.00	2808.6	318.33	0.	2808.7	84.26	1649.1	11915.
	939.8	112.99	86.92	939.8	28.194	1.8800	13055.
	4375.0	342.08	495.83	4375.0	131.25	1.0000	14723.
	3000.0	748.00	340.00	3000.0	90.000	1330.8	1765.8
	3600.0	571.20	408.00	3600.0	108.00	-.04	1765.8
	0.	.05	1766.8	0.	0.	12.000	0.
	0.	-.02	441.69	0.	0.	16.000	0.
	48.000	.001	227.73	1.2500	1.2500	12.000	210.00
	25.000	.001	1.0000	3.0100	3.0000	12.000	75000.
	30.000	.001	7.0000	4.0000	4.0000	12.000	108.00
	10928.	552.37	1.0000				
	312.79	103.75					
	33577.	55227.					
	9753.	20593.					

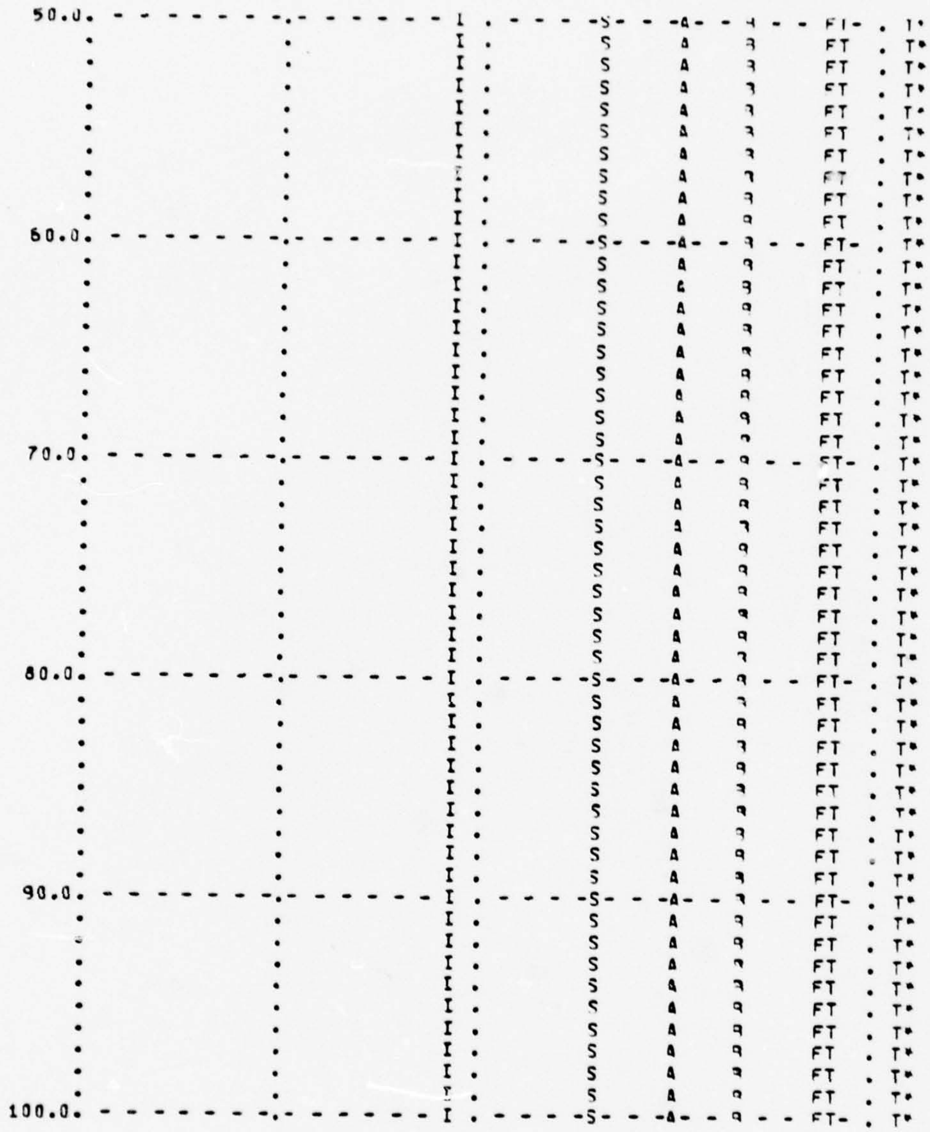
100.00	2809.7	313.33	0.	2808.6	94.26	1549.1	11915.
	939.8	117.01	86.93	939.8	29.193	1.9800	13055.
	4375.0	142.03	495.83	4375.0	131.25	1.0000	14723.
	3000.0	743.00	340.00	3000.0	90.000	1330.6	1765.8
	3600.0	571.20	408.00	3600.0	109.00	-.05	1765.8
	0.	-.07	1766.8	0.	0.	12.000	0.
	0.	.00	441.69	0.	0.	16.000	0.
	48.000	.000	227.73	1.2500	1.2500	12.000	210.00
	25.000	.000	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.000	7.0000	4.0000	4.0000	12.000	108.00
	11386.	575.31	1.0000				
	325.98	108.17					
	34995.	57559.					
	10168.	20795.					

PAGE 27 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

JOB(1)=S JOB(2)=I JOB(3)=F JOB(4)=B JOB(5)=A TOTFOR=T
FORSIZ=*

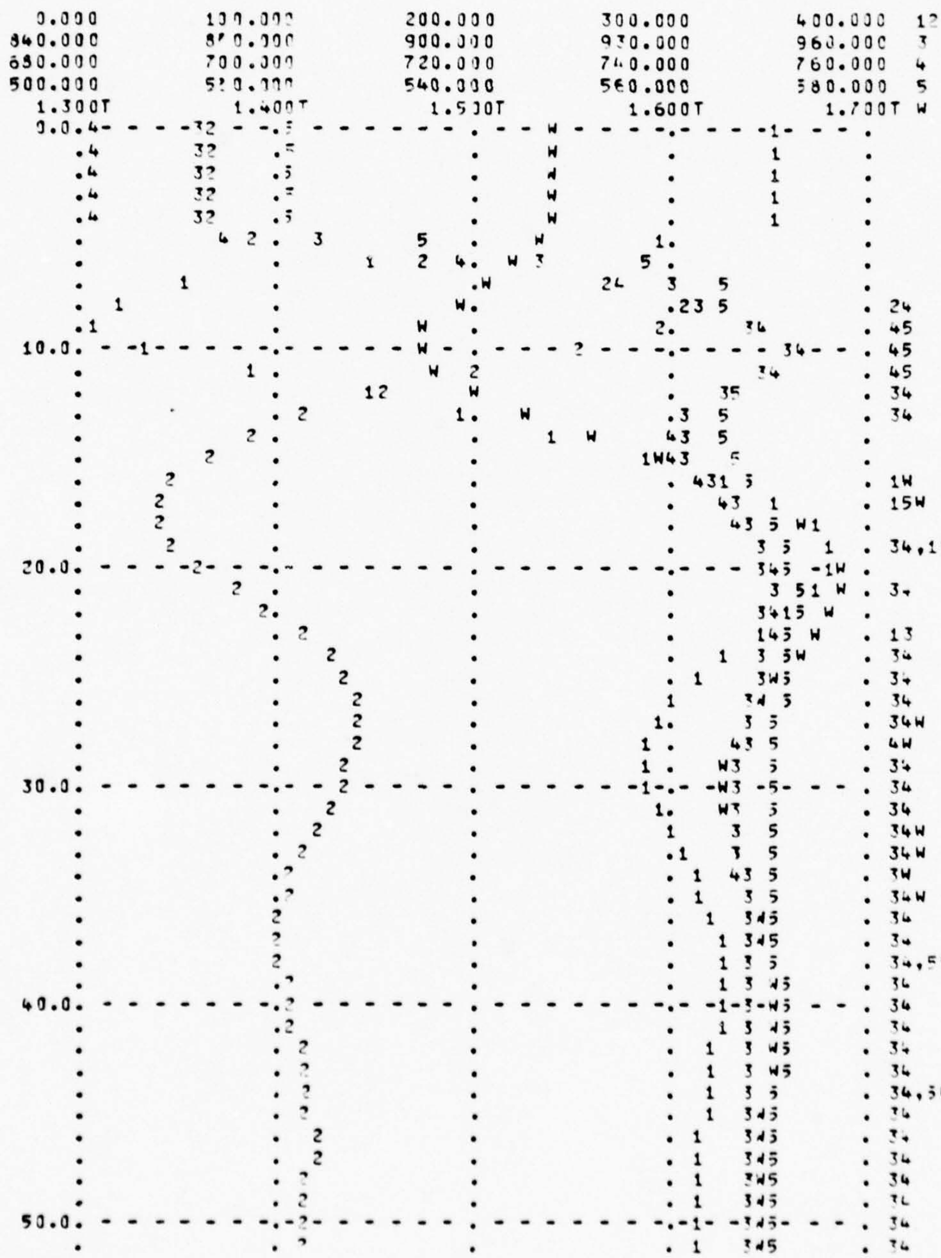
```
 1.500T        2.000T        2.500T        3.000T        3.500T S
 0.000T         .500T        1.000T        1.500T        2.000T I
 4.300T        4.320T        4.340T        4.360T        4.380T F
 2.950T        2.965T        2.980T        2.995T        3.010T B
 3.540T        3.560T        3.580T        3.600T        3.620T A
18.300T       18.500T       18.700T       18.900T       19.100T T*
```

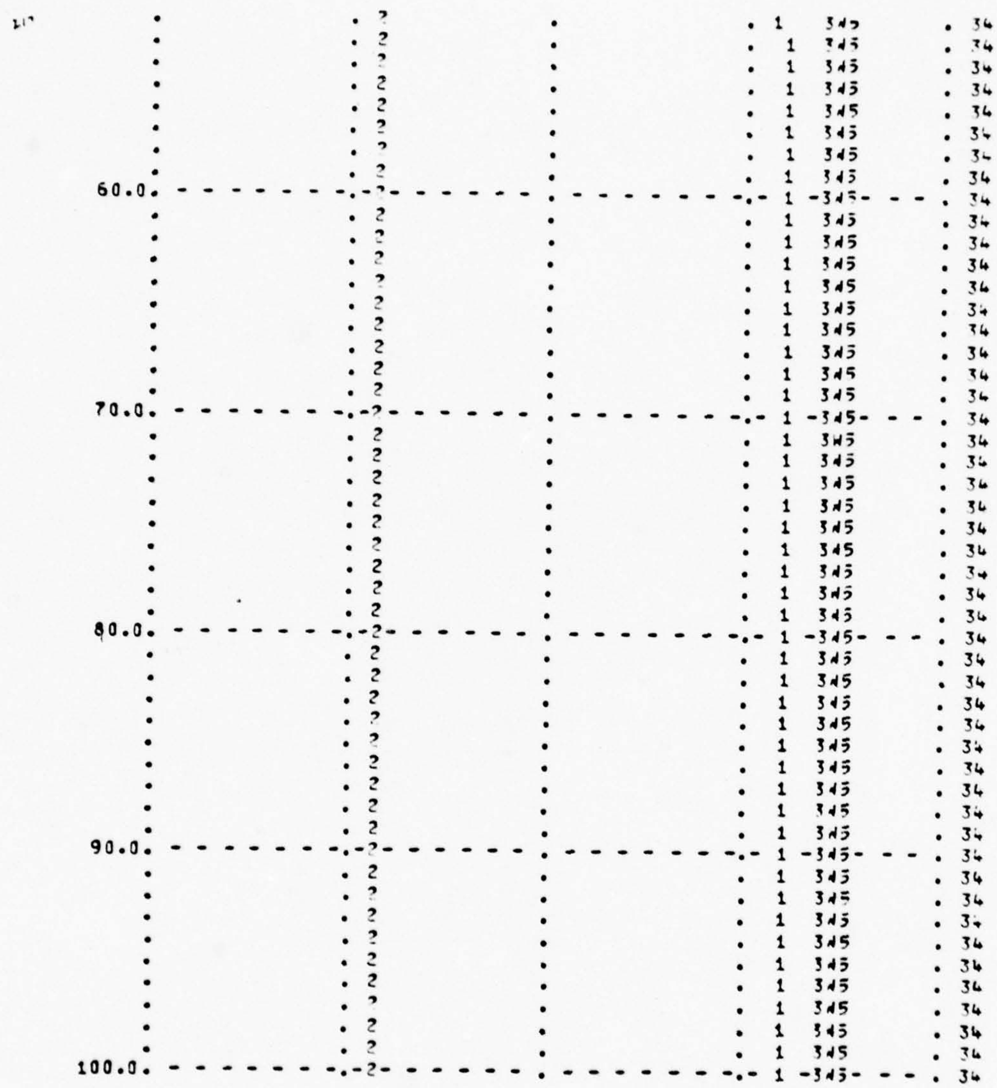



50.0
60.0
70.0
80.0
90.0
100.0

PAGE 28 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W




60.0
70.0
80.0
90.0
100.0

```
PAGE  29  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

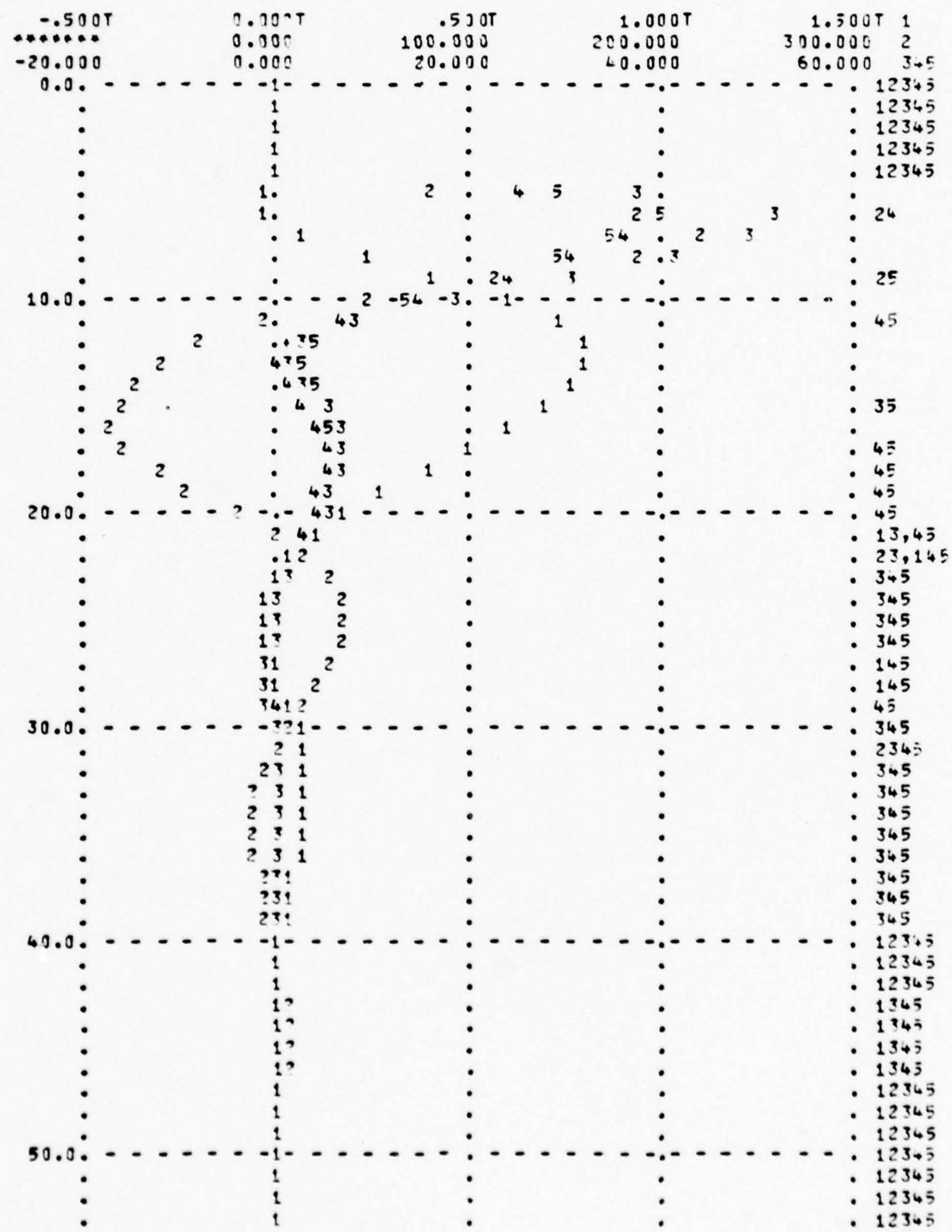
 PREC=R  UPT=G  DSIZE=C  DCSIZE=D  TPINS=%  FOEFC=E  TRNSFC=@

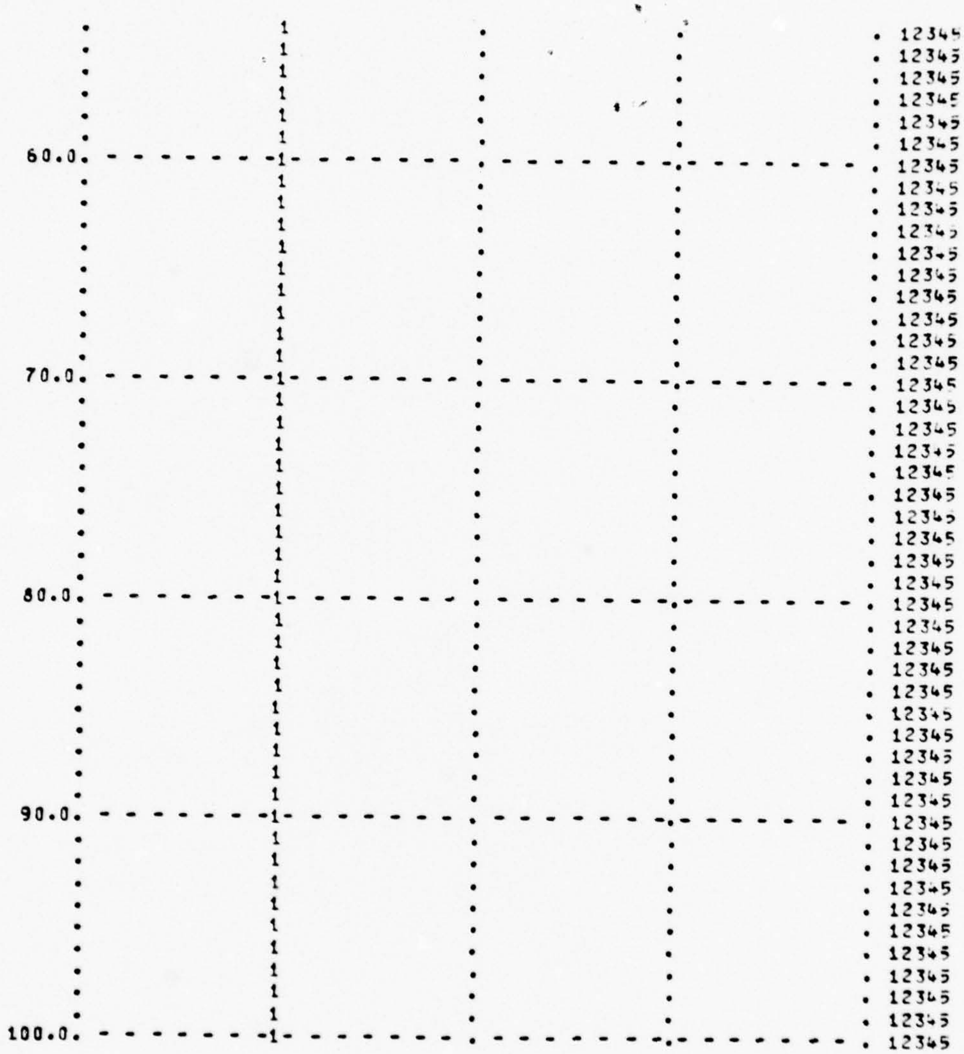
300.000        400.000        500.000        600.000        700.000  RG
 0.000T         1.000T         2.000T         3.000T         4.000T CD
 1.400          1.700          2.000          2.300          2.600  %
  .985           .990           .995          1.000          1.005  E
  .200           .210           .220           .230           .240  @
  0.0R - - - - - - - -.-@C - - % - - . - - - - - - - -E- - - - - - - - . RG,CD
     R               . @C     %     .              E              . RG,CD
     R               . @C     %     .              E              . RG,CD
     R               . @C     %     .              E              . RG,CD
     R               . @C     %     .              E              . RG,CD
     G         R     .  @E C D      .              %              .
     G         E     . R   @  C   D.               .        %     .
     .G          E   .          R C. D             .      %       . R@
     . G             . E          @ . C DR       % .              .
     .   G           .       E    @ .   CD      R  .              . D%
  10.0. - - -G- - - -.- - - - - - - -%. E - C - - - -@- - - - - - - . CD,%@
     .          G    .        %   @      C  E      @              . CD
     .               .G   %         .@ DC       R  .              . RE
     .               .  % G         .  DC     R    E.             . C@
     .               . %        G   .DC  R @      E .             .
     .               %            DRG          E   .              . RC,E@
     .              %.          R DC .   G      E   @.            .
     .              %     R    DC   .    G      E   .@            .
     .               .%R       DC    .    G      E   .  @          .
     .               R  %     DC    .    G      E   .  @          .
  20.0. - - - - - - -R.- - -%-C- - - . G - - - - E -.- -@- - - - - - . CD
     .              R.        C      G           E . @             . CD%
     .              R.         C %G  .           E .  @            . CD
     .               .R        CG %  .            E. @             . GD
     .               . R      G C  % .             E               . CD,E@
     .               .    R G    C % .            @E               . CD
     .               .     GR     CD% .           @ E              .
     .               .    G  R      C .          @  E              . CD%
     .               .    G     R  CD .         @   .E              . C%
     .               .    G     R % C .        @    .E              . CD
  30.0. - - - - - - - -.- -G- - -R- C . - - - - -@- -E- - - - - - - . CD,R%
     .               .     G   %R  C .        @    E              . CD
     .               .      G %R    C .        @    E              . CD
     .               .      G %R  C  .        @    E              . CD
     .               .       GR   C  .         @   E              . CD,R%
     .               .        R   C  .         @   E              . RG%,CD
     .               .      R G  DC  .          @  E              . G%
     .               .      R G  C   .          @  E              . CD,G%
     .               .      R G  C   .          @  E              . CD,G%
     .               .     R  G  C   .          @  E              . CD,G%
  40.0. - - - - - - - -.- - R G % C - . - - - - - - @ -E- - - - - - - . CD
     .               .     R G % C   .          @  E              . CD
     .               .     R G % C   .          @  E              . CD
     .               .      RG % C   .          @  E              . CD
     .               .      R    %C  .          @  E              . RG,CD
     .               .      R    %C  .          @  E              . RG,CD
     .               .      R  %  C  .          @  E              . RG,CD
     .               .      R  %  C  .          @  E              . RG,CD
     .               .      GR %  C  .         @   E              . CD
     .               .      GR %  C  .         @   E              . CD
  50.0. - - - - - - - -.- - -GR % -C- . - - - - - -@- -E- - - - - - - . CD
     .               .      GR %  C  .         @   E              . CD
```

```
     .                    .       GR  %    C   .              @    E                    . CD
     .                    .       GR  %    C   .              @    E                    . CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
 50.0. - - - - - - - - - -.- - -R-  %  C - . - - - - - - - -  @  -E- - - - - - - - - - . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  CD    .              @    E                    . RG
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
 70.0. - - - - - - - - - -.- - -R-  %  -C- . - - - - - - - -  @  -E- - - - - - - - - - . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
 80.0. - - - - - - - - - -.- - -R-  %  C - . - - - - - - - -  @  -E- - - - - - - - - - . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  C     .              @    E                    . RG,CD
     .                    .       R   %  CD    .              @    E                    . RG
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
 90.0. - - - - - - - - - -.- - -R-  %  -C- . - - - - - - - -  @  -E- - - - - - - - - - . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
     .                    .       R   %    C   .              @    E                    . RG,CD
100.0. - - - - - - - - - -.- - -R-  %  -C- . - - - - - - - -  @  -E- - - - - - - - - - . RG,CD
```

PAGE 30 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

OFDSC(1)=1 OFDSC(2)=2 OFDSC(3)=3 OFDSC(4)=4 OFDSC(5)=5




60.0
70.0
80.0
90.0
100.0

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OCRATI(5)=6

```
 1.235          1.240          1.245          1.250          1.255  12
 2.950          2.965          2.980          2.995          3.010  34
 3.340          3.360          3.980          4.000          4.020  56
  0.0. - - - - - - -.- - - - - - - -. - - - - - - - -1- - 3 - - - - - . 1256,34
     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
     .            1 .     5   3    .              2     4             . 26
     1           53 .              .              2     4             . 25
     .  1           3.5            .              2     4             . 26
     .       1      .    3 5       .              2     4             . 26
     .              .  1       3   .              2     4             . 35,26
 10.0. - - - - - - -.- - - - - - -1. -5- 3 - - - -2- - 4 - - - - - . 26
     .              .              .      15     32     4             . 26
     .              .              .          1  2   3 4              . 15,26
     .              .              .          51 2     3              . 34,26
     .              .              .          1  2    34              . 15,26
     .              .              .         1   2 3   4              . 15,26
     .              .              .       1 5  23      4             . 26
     .              .              .       1 5   2      4             . 236
     .              .              .       1 5   2      4             . 236
     .              .              .        1 5  2      4             . 236
 20.0. - - - - - - -.- - - - - - - -. - - - - -15 -23 - 4 - - - - - . 26
     .              .              .          15 2 3  4               . 26
     .              .              .           1 2   3 4              . 15,26
     .              .              .            12    34              . 15,26
     .              .              .            51     3              . 126,34
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     .              .              .              21    43            . 256
     .              .              .              21    43            . 256
 30.0. - - - - - - -.- - - - - - - -. - - - - - - - -21 - 3 - - - - - . 34,256
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     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
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     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
 40.0. - - - - - - -.- - - - - - - -. - - - - - - - -1- - 3 - - - - - . 1256,34
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     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
     .              .              .              1     3             . 1256,34
 50.0. - - - - - - -.- - - - - - - -. - - - - - - - -1- - 3 - - - - - . 1256,34
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     .              .              .              1     3             . 1256,34
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       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
  60.0. - - - - - - - -.- - - - - - - - .- - - - - - - -1- - 3 - - - - - . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
  70.0. - - - - - - - -.- - - - - - - - .- - - - - - - -1- - 3 - - - - - . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
  80.0. - - - - - - - -.- - - - - - - - .- - - - - - - -1- - 3 - - - - - . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
  90.0. - - - - - - - -.- - - - - - - - .- - - - - - - -1- - 3 - - - - - . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
       .                   .                   .                   1     3             . 1256,34
       .                   .                   .                   1     3             . 1255,34
 100.0. - - - - - - - -.- - - - - - - - .- - - - - - - -1- - 3 - - - - - . 1256,34
```

CHANGES FOR RERUN -

ORIGINAL H4	0.000	0.000	0.000	0.000	0.000
PRESENT H4	1.000	1.000	1.000	1.000	1.000

```
PAGE  33  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

  TIME       JOB     TRNG      NEED  FFORCE     ATT     WIND  DIMFOR
               2        2         2       2       2    TRINS  TOTFOR
               3        3         3       3       3      CAP  TODFOR
               4        4         4       4       4   TONEED   OSIZE
               5        5         5       5       5    FORCE  DOSIZE
            HERR    DEOST      RATT  CRATIO  DORATI      ATJ  NHOURS
               2        2      PREC       2       2        2       2
               3        3    TRNGFC       3       3        3       3
               4        4     FOEFC       4       4        4       4
               5        5      TDEL       5       5        5       5
           SCOST    RCOST      TRAV
           PCOST    ACOST
           TCOST   TOTCOS
           UCOST    OCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  E-01      E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-03    E-00    E-00     E-00    E 03
            E-00     E-00      E-00    E-00    E-00     E-00    E-00
            E-00     E-00      E-00    E-00    E-10     E-00    E 03
            E 06     E 05      E-00
            E 06     E 05
            E 06     E 05
            E 06     E 05
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  0.00    3425.0   353.97        0.  3425.0   58.50   1540.8  11615.
           640.0    68.52     52.80   640.0  12.300   1.8900  13065.
          4375.0    859.0    452.08  4375.0   87.50   1.0000  15040.
          3000.0   582.00    310.00  3000.0   60.00   1186.9  1203.2
          3600.0   520.80    372.00  3600.0   72.00      0.0  1203.2
              0.      0.0    1203.2      0.      0.   12.000      0.
              0.     0.00    300.80      0.      0.   16.000      0.
          48.000     -.00    211.12  1.2500  1.2500   12.000  210.00
          25.000     -.00    1.0000  3.0000  3.0000   12.000  75000.
          30.000     -.00    7.0000  4.0000  4.0000   12.000  103.00
              0.     0.00    1.0000
            0.00     0.00
              0.       0.
              0.       0.
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4.00	3425.0	357.37	0.	3425.0	137.00	1540.8	11615.
	640.0	53.54	52.60	640.0	25.600	1.9800	19365.
	4375.0	853.0	452.08	4375.0	175.00	1.0000	15140.
	3000.0	682.00	310.00	3000.0	120.00	1196.9	1203.2
	3600.0	520.80	372.00	3600.0	144.00	.0	1203.2
	0.	.0	1203.2	0.	0.	12.000	0.
	0.	.00	300.80	0.	0.	16.000	0.
	48.000	.00	211.12	1.2500	1.2500	12.000	210.00
	25.000	.00	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.00	7.0000	4.0000	4.0000	12.000	103.00
	459.	15.54	1.0000				
	12.33	3.01					
	1325.	2036.					
	283.	1939.					
8.00	2436.6	9.55	0.	2550.2	89.99	1442.0	12555.
	1126.8	437.45	535.18	1539.9	41.615	2.5611	19048.
	4200.0	860.0	646.67	4375.0	135.11	1.0885	15115.
	2879.7	596.77	443.61	3000.0	106.35	2158.8	2885.9
	3454.8	514.33	533.30	3600.0	127.59	1499.9	3335.6
	0.	113.5	1835.9	0.	0.	11.137	0.
	0.	463.07	721.48	0.	0.	16.000	0.
	50.000	175.01	218.86	1.2000	1.2500	12.000	210.00
	26.044	120.30	.9599	2.8737	3.0000	12.000	75000.
	31.251	145.23	7.6201	3.8386	4.0000	12.000	103.00
	903.	42.50	.9740				
	24.34	8.49					
	2614.	4157.					
	565.	3776.					
12.00	1576.2	.13	0.	2369.1	58.13	1425.4	12939.
	1774.5	292.77	239.31	1853.8	55.442	1.3143	17433.
	4095.0	893.5	744.86	4375.0	151.02	1.1397	15208.
	2808.2	705.43	510.70	3000.0	103.56	2106.1	3395.9
	3371.4	543.79	611.25	3600.0	124.34	1479.5	3433.1
	0.	792.9	1958.6	0.	0.	11.262	0.
	0.	89.37	838.77	0.	0.	16.000	0.
	51.232	279.95	220.63	1.1700	1.2500	12.000	210.00
	26.708	191.37	.9362	2.3082	3.0000	12.000	75000.
	32.034	228.55	7.9778	3.7460	4.0000	12.000	103.00
	1329.	84.39	1.0185				
	35.55	13.59					
	3849.	5215.					
	907.	5392.					

16.00	1107.4	.00	0.	2222.6	42.89	1637.0	12479.
	1636.9	97.92	37.54	1504.1	37.788	1.5628	17733.
	4232.6	1095.1	635.09	4375.0	163.91	1.0722	14702.
	2893.2	354.55	441.38	3000.0	112.12	1624.9	2721.9
	3497.0	658.91	510.84	3600.0	135.42	583.8	2591.2
	0.	1115.1	2007.3	0.	0.	11.791	0.
	0.	-132.81	680.47	0.	0.	16.000	0.
	49.615	142.47	246.07	1.2093	1.2500	12.000	210.00
	25.905	104.79	.9681	2.9952	3.0000	12.000	75000.
	30.883	102.95	7.5053	3.8856	4.0000	12.000	108.00
	1749.	125.13	1.0799				
	47.78	18.57					
	5085.	8461.					
	1436.	6955.					
20.00	1639.0	474.57	0.	2242.3	56.58	1849.4	12020.
	1156.0	21.24	26.16	1045.1	45.351	1.6502	13500.
	4388.4	1023.1	519.67	4375.0	178.27	1.0000	14253.
	3012.5	819.32	353.42	3000.0	122.37	1334.7	1307.7
	3601.8	514.50	435.48	3600.0	146.31	-284.8	1321.0
	0.	503.3	2105.8	0.	0.	12.138	0.
	0.	-110.92	476.92	0.	0.	16.000	0.
	47.853	-13.42	258.18	1.2538	1.2500	12.000	210.00
	24.896	-12.32	1.0025	3.0125	3.0000	12.000	75000.
	29.985	-1.85	7.0000	4.0021	4.0000	12.000	108.00
	2184.	155.24	1.0067				
	61.82	24.01					
	6535.	11103.					
	2141.	8651.					
24.00	2431.1	353.92	0.	2279.1	98.72	1837.9	11357.
	946.0	144.11	148.90	992.3	33.415	1.8928	13144.
	4353.4	1030.6	548.02	4375.0	177.19	1.0000	14246.
	2991.9	314.55	375.94	3000.0	121.50	1521.5	1335.2
	3593.1	527.59	448.66	3600.0	145.91	-286.7	1345.4
	0.	-152.1	2233.1	0.	0.	11.927	0.
	0.	46.34	471.30	0.	0.	16.000	0.
	48.128	11.62	251.70	1.2487	1.2500	12.000	210.00
	25.057	9.05	.9976	2.9919	3.0000	12.000	75000.
	30.058	6.91	7.0000	3.9923	4.0000	12.000	108.00
	2633.	178.99	1.0004				
	76.57	29.75					
	8129.	13864.					
	2813.	10248.					

28.00	2320.0	227.22	0.	2210.2	92.17	1730.6	12202.
	1152.6	233.77	185.08	1227.1	45.787	2.0358	13137.
	4378.1	1027.0	536.73	4375.0	173.93	1.0346	14412.
	3001.8	316.31	368.26	3000.0	119.25	1532.5	2345.4
	3601.7	521.37	442.39	3600.0	143.08	131.8	2415.3
	0.	-109.2	2284.5	0.	0.	11.933	0.
	0.	74.55	586.60	0.	0.	16.000	0.
	47.955	-3.15	243.51	1.2509	1.2500	12.000	210.00
	24.985	-1.93	1.0006	3.0018	3.0000	12.000	75000.
	29.986	-1.74	7.2425	4.0019	4.0000	12.000	108.00
	3098.	206.17	.9822				
	90.98	35.55					
	9681.	16464.					
	3352.	11638.					

32.00	2027.5	179.79	0.	2212.8	79.82	1676.0	12342.
	1352.2	209.75	145.56	1366.5	53.235	1.9049	13371.
	4377.3	1019.1	536.20	4375.0	172.32	1.0576	14554.
	3002.0	308.81	367.29	3000.0	118.18	1490.5	2575.8
	3601.6	518.30	441.44	3600.0	141.79	302.9	2530.8
	0.	185.4	2277.9	0.	0.	11.992	0.
	0.	14.30	643.96	0.	0.	16.000	0.
	47.975	-2.25	239.03	1.2506	1.2500	12.000	210.00
	24.983	-2.03	1.0005	3.0020	3.0000	12.000	75000.
	29.987	-1.55	7.4031	4.0017	4.0000	12.000	108.00
	3554.	233.46	.9935				
	104.54	41.29					
	11159.	18929.					
	3832.	12775.					

36.00	1955.0	241.54	0.	2224.9	77.65	1716.2	12292.
	1341.9	149.05	103.27	1307.2	53.294	1.8159	13329.
	4374.1	1021.3	538.53	4375.0	173.72	1.0437	14507.
	2999.2	110.77	369.44	3000.0	119.12	1454.2	2435.6
	3599.4	619.28	442.96	3600.0	142.96	134.4	2401.5
	0.	269.3	2267.1	0.	0.	12.032	0.
	0.	-34.69	609.15	0.	0.	16.000	0.
	48.010	.93	242.09	1.2497	1.2500	12.000	210.00
	25.007	.84	.9998	2.9992	3.0000	12.000	75000.
	30.005	.59	7.3056	3.9994	4.0000	12.000	108.00
	4005.	271.39	1.0077				
	118.05	46.89					
	12511.	21404.					
	4351.	13935.					

40.00	2125.4	306.[illegible]	0.	2228.1	85.36	1772.5	12157.
	1221.1	178.[illegible]	100.91	1132.3	49.140	1.3231	13335.
	4372.5	1025.[illegible]	540.79	4375.0	175.51	1.0226	14335.
	2999.3	314.75	370.92	3000.0	120.42	1457.4	2225.0
	3598.3	621.[illegible]	444.80	3500.0	144.51	-75.5	2202.1
	0.	132.[illegible]	2278.6	0.	0.	12.023	0.
	0.	-28.7[illegible]	556.51	0.	0.	16.000	0.
	48.025	2.3[illegible]	245.97	1.2493	1.2500	12.000	210.00
	25.014	1.73	.9995	2.9983	3.0000	12.000	75000.
	30.014	1.59	7.1582	3.9981	4.0000	12.000	103.00
	4459.	301.72	1.0080				
	132.03	52.59					
	14093.	23957.					
	4923.	14928.					

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44.00	2284.1	307.0[illegible]	0.	2219.7	91.96	1791.9	12137.
	1157.5	152.5[illegible]	125.66	1162.3	45.552	1.8908	13122.
	4374.0	1027.[illegible]	540.76	4375.0	175.91	1.0189	14357.
	2999.2	315.93	370.84	3000.0	120.62	1482.2	2133.6
	3599.2	622.95	444.92	3600.0	144.75	-103.6	2195.9
	0.	-64.[illegible]	2300.5	0.	0.	11.993	0.
	0.	4.92	547.14	0.	0.	16.000	0.
	48.011	1.0[illegible]	246.21	1.2497	1.2500	12.000	210.00
	25.006	.75	.9998	2.9992	3.0000	12.000	75000.
	30.007	.71	7.1320	3.9991	4.0000	12.000	103.00
	4915.	330.2[illegible]	1.0004				
	145.29	58.[illegible]					
	15624.	26575.					
	5493.	15742.					

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48.00	2279.8	269.40	0.	2210.8	91.19	1754.4	12133.
	1194.6	178.5[illegible]	140.58	1214.2	47.792	1.9196	13115.
	4375.7	1026.1	539.38	4375.0	175.02	1.0293	14400.
	3000.5	314.65	369.51	3000.0	120.01	1493.7	2243.2
	3600.5	621.93	443.94	3500.0	144.01	1.4	2312.0
	0.	-69.0	2310.7	0.	0.	11.982	0.
	0.	19.51	573.30	0.	0.	16.000	0.
	47.992	-.71	244.04	1.2502	1.2500	12.000	210.00
	24.995	-.54	1.0002	3.0105	3.0000	12.000	75000.
	29.996	-.45	7.2052	4.0005	4.0000	12.000	103.00
	5375.	359.23	.9955				
	160.44	64.15					
	17150.	29153.					
	6044.	16560.					

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PAGE 38 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

52.00	2194.3	250.07	0.	2211.0	57.46	1734.8	12234.
	1251.4	177.55	133.42	1258.6	49.377	1.8938	13043.
	4375.9	1024.1	538.75	4375.0	174.41	1.0370	14445.
	3000.7	313.10	369.39	3000.0	119.60	1484.9	2369.8
	3600.6	620.93	443.39	3600.0	143.51	57.9	2374.5
	0.	15.7	2306.7	0.	0.	11.995	0.
	0.	7.22	592.45	0.	0.	16.000	0.
	47.990	-.97	242.63	1.2502	1.2500	12.000	210.00
	24.995	-.63	1.0002	3.0007	3.0000	12.000	75000.
	29.995	-.53	7.2589	4.0007	4.0000	12.000	108.00
	5833.	389.59	.9975				
	174.38	59.97					
	18655.	31630.					
	6555.	17283.					
56.00	2155.7	261.77	0.	2215.3	96.05	1740.8	12227.
	1259.2	152.30	121.39	1251.8	50.254	1.9654	13013.
	4375.0	1024.1	539.21	4375.0	174.63	1.0349	14442.
	3000.0	313.03	369.75	3000.0	119.75	1474.0	2349.0
	3600.0	620.95	443.67	3600.0	143.70	40.2	2340.9
	0.	59.5	2300.7	0.	0.	12.007	0.
	0.	-7.44	587.26	0.	0.	16.000	0.
	48.000	-.01	243.15	1.2500	1.2500	12.000	210.00
	25.000	.00	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.03	7.2443	4.0000	4.0000	12.000	103.00
	6290.	420.75	1.0014				
	188.27	75.67					
	20148.	34223.					
	7101.	17947.					
60.00	2187.8	279.71	0.	2216.9	97.58	1755.8	12197.
	1230.5	154.65	118.88	1222.2	49.250	1.8636	13043.
	4374.5	1025.2	539.85	4375.0	175.12	1.0293	14414.
	2999.6	313.93	370.21	3000.0	120.08	1473.1	2233.2
	3599.5	621.51	444.16	3600.0	144.10	-15.1	2235.0
	0.	29.1	2301.0	0.	0.	12.007	0.
	0.	-8.37	573.31	0.	0.	16.000	0.
	48.005	.54	244.24	1.2498	1.2500	12.000	210.00
	25.003	.41	.9999	2.9996	3.0000	12.000	75000.
	30.003	.33	7.2053	3.9996	4.0000	12.000	103.00
	6747.	450.55	1.0022				
	202.26	81.42					
	21649.	36778.					
	7648.	19547.					

64.00	2230.0	282.30	0.	2215.0	89.34	1750.6	12135.
	1210.1	159.74	124.57	1209.9	48.481	1.8798	13080.
	4374.7	1025.8	539.93	4375.0	175.26	1.0275	14410.
	2999.8	314.50	370.25	3000.0	120.18	1479.0	2274.8
	3599.8	621.93	444.27	3600.0	144.22	-29.9	2275.6
	0.	-15.0	2305.5	0.	0.	11.999	0.
	0.	-.13	568.70	0.	0.	16.000	0.
	48.003	.32	244.51	1.2499	1.2500	12.000	210.00
	25.002	.23	.9999	2.9998	3.0000	12.000	75000.
	30.002	.24	7.1923	3.9997	4.0000	12.000	103.00
	7204.	480.21	1.0004				
	215.33	87.13					
	23160.	39746.					
	8193.	19073.					
68.00	2235.2	274.15	0.	2212.8	89.44	1754.6	12136.
	1215.8	166.44	129.16	1220.6	68.550	1.8896	13033.
	4375.1	1025.7	539.61	4375.0	175.06	1.0297	14408.
	3000.1	314.25	370.00	3000.0	120.04	1482.8	2297.4
	3600.1	621.77	444.04	3600.0	144.05	-6.1	2302.1
	0.	-22.4	2308.3	0.	0.	11.996	0.
	0.	4.79	574.35	0.	0.	16.000	0.
	47.999	-.13	244.02	1.2500	1.2500	12.000	210.00
	24.999	-.10	1.0000	3.0001	3.0000	12.000	75000.
	29.999	-.08	7.2082	4.0001	4.0000	12.000	103.00
	7662.	509.89	.9990				
	230.40	92.35					
	24672.	41910.					
	8743.	19587.					
72.00	2214.2	267.77	0.	2212.6	88.50	1748.6	12208.
	1230.8	167.47	128.25	1233.5	49.134	1.8851	13055.
	4375.2	1025.0	539.39	4375.0	174.87	1.0320	14421.
	3000.2	313.8	369.85	3000.0	119.91	1481.4	2320.3
	3600.2	521.47	443.86	3500.0	143.39	14.9	2322.3
	0.	-1.5	2307.4	0.	0.	11.998	0.
	0.	2.64	580.07	0.	0.	16.000	0.
	47.997	-.25	243.60	1.2501	1.2500	12.000	210.00
	24.998	-.13	1.0001	3.0002	3.0000	12.000	75000.
	29.999	-.13	7.2242	4.0002	4.0000	12.000	103.00
	8120.	539.91	.9992				
	244.41	98.77					
	26180.	44454.					
	9281.	20071.					

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75.00	2200.5	269.41	0.	2213.7	97.96	1748.9	12209.
	1235.4	153.63	125.11	1234.1	49.387	1.5773	13053.
	4375.1	1024.9	539.46	4375.0	174.69	1.0319	14423.
	3000.0	313.77	369.92	3000.0	119.93	1478.4	2313.3
	3600.0	621.47	443.90	3600.0	143.91	12.0	2317.6
	0.	13.2	2305.6	0.	0.	12.001	0.
	0.	-1.35	579.81	0.	0.	16.000	0.
	47.999	-.05	243.65	1.2500	1.2500	12.000	210.00
	25.000	-.04	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.04	7.2235	4.0000	4.0000	12.000	108.00
	8577.	570.09	1.0002				
	258.39	104.49					
	27684.	47014.					
	9820.	20433.					

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80.00	2205.6	274.10	0.	2214.4	98.23	1752.7	12202.
	1229.2	161.39	123.95	1226.9	49.173	1.8755	13058.
	4374.9	1025.2	539.63	4375.0	175.01	1.0305	14415.
	2999.9	313.36	370.04	3000.0	120.01	1477.6	2305.4
	3599.9	621.55	444.02	3600.0	144.01	-1.9	2303.3
	0.	8.7	2305.2	0.	0.	12.002	0.
	0.	-2.29	576.35	0.	0.	16.000	0.
	48.001	.12	243.93	1.2500	1.2500	12.000	210.00
	25.001	.09	1.0000	2.9999	3.0000	12.000	75000.
	30.001	.09	7.2138	3.9999	4.0000	12.000	108.00
	9035.	500.15	1.0006				
	272.40	110.25					
	29189.	49559.					
	10362.	20737.					

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84.00	2216.6	275.65	0.	2214.0	98.70	1754.5	12136.
	1223.1	152.10	125.15	1222.7	48.945	1.8792	13058.
	4374.9	1025.5	539.68	4375.0	175.07	1.0298	14412.
	2999.9	314.12	370.07	3000.0	120.05	1479.0	2293.5
	3599.9	621.69	444.07	3600.0	144.06	-7.9	2293.3
	0.	-2.5	2306.2	0.	0.	12.000	0.
	0.	-.44	574.62	0.	0.	16.000	0.
	48.001	.10	244.04	1.2500	1.2500	12.000	210.00
	25.001	.07	1.0000	2.9999	3.0000	12.000	75000.
	30.001	.07	7.2089	3.9999	4.0000	12.000	108.00
	9492.	530.09	1.0002				
	286.43	116.09					
	30695.	52129.					
	10907.	21129.					

- -

88.00	2219.7	273.73	0.	2213.4	88.80	1753.3	12200.
	1223.5	153.95	126.48	1224.6	48.947	1.8822	13070.
	4375.0	1025.3	539.61	4375.0	175.03	1.0303	14413.
	3000.0	314.03	370.01	3000.0	120.02	1480.1	2302.8
	3600.0	521.65	444.02	3600.0	144.02	-3.0	2304.0
	0.	-6.2	2307.0	0.	0.	11.999	0.
	0.	1.09	575.71	0.	0.	16.000	0.
	48.000	-.02	243.94	1.2500	1.2500	12.000	210.00
	25.000	-.01	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.01	7.2120	4.0000	4.0000	12.000	108.00
	9950.	559.93	.9958				
	300.46	121.73					
	32205.	54687.					
	11450.	21425.					

92.00	2215.0	271.87	0.	2213.3	88.58	1751.6	12203.
	1227.2	154.54	126.49	1228.1	49.081	1.8817	13055.
	4375.1	1025.2	539.54	4375.0	174.97	1.0309	14416.
	3000.0	313.93	369.97	3000.0	119.98	1480.0	2303.2
	3600.0	521.59	443.97	3600.0	143.98	3.0	2303.9
	0.	-1.7	2306.9	0.	0.	11.999	0.
	0.	.84	577.30	0.	0.	16.000	0.
	47.999	-.05	243.82	1.2500	1.2500	12.000	210.00
	25.000	-.05	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.05	7.2164	4.0001	4.0000	12.000	108.00
	10407.	589.35	.9958				
	314.48	127.55					
	33712.	57243.					
	11991.	21696.					

96.00	2210.7	271.34	0.	2213.6	88.41	1751.4	12204.
	1229.0	153.77	125.72	1228.8	49.152	1.8796	13053.
	4375.0	1025.1	539.55	4375.0	174.97	1.0310	14417.
	3000.0	313.94	369.97	3000.0	119.98	1479.2	2310.1
	3600.0	521.55	443.97	3600.0	143.97	3.4	2303.8
	0.	2.3	2306.4	0.	0.	12.000	0.
	0.	-.13	577.52	0.	0.	16.000	0.
	48.000	-.02	243.81	1.2500	1.2500	12.000	210.00
	25.000	-.02	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.02	7.2171	4.0000	4.0000	12.000	108.00
	10865.	719.98	1.0000				
	328.49	133.32					
	35219.	59797.					
	12532.	21940.					

100.00	2211.2	273.10	0.	2213.8	39.45	1752.3	12202.
	1227.8	153.01	125.31	1227.2	49.112	1.9788	13053.
	4375.0	1025.2	539.59	4375.0	175.00	1.0307	14416.
	3000.0	313.93	370.01	3000.0	120.00	1478.9	2305.6
	3600.0	621.52	444.00	3600.0	144.00	.1	2305.3
	0.	2.5	2306.2	0.	0.	12.001	0.
	0.	-.53	576.71	0.	0.	16.000	0.
	48.000	.02	243.88	1.2500	1.2500	12.000	210.00
	25.000	.02	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.02	7.2148	4.0000	4.0000	12.000	108.00
	11323.	750.00	1.0001				
	342.51	139.03					
	36725.	52353.					
	13074.	22161.					

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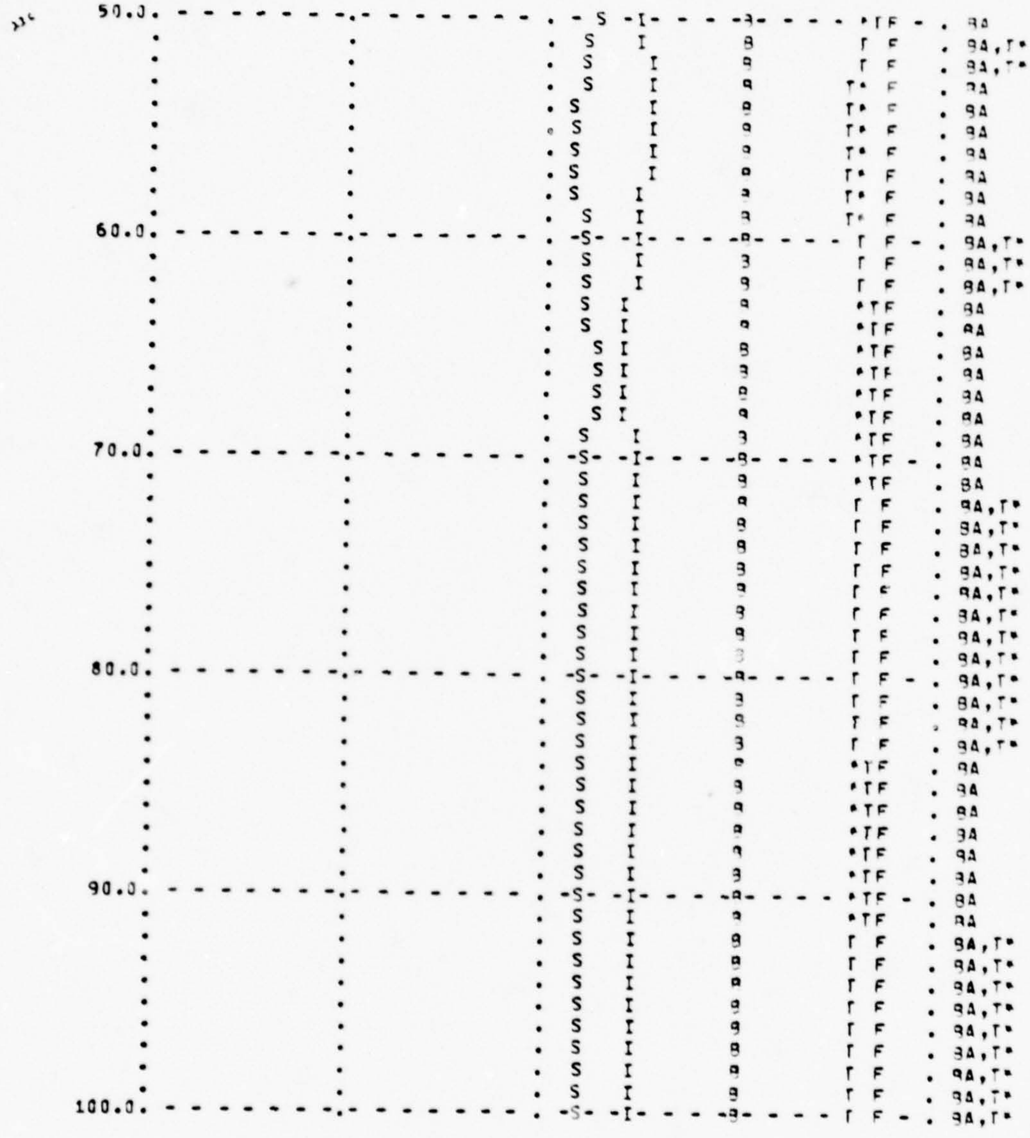
PAGE 43 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

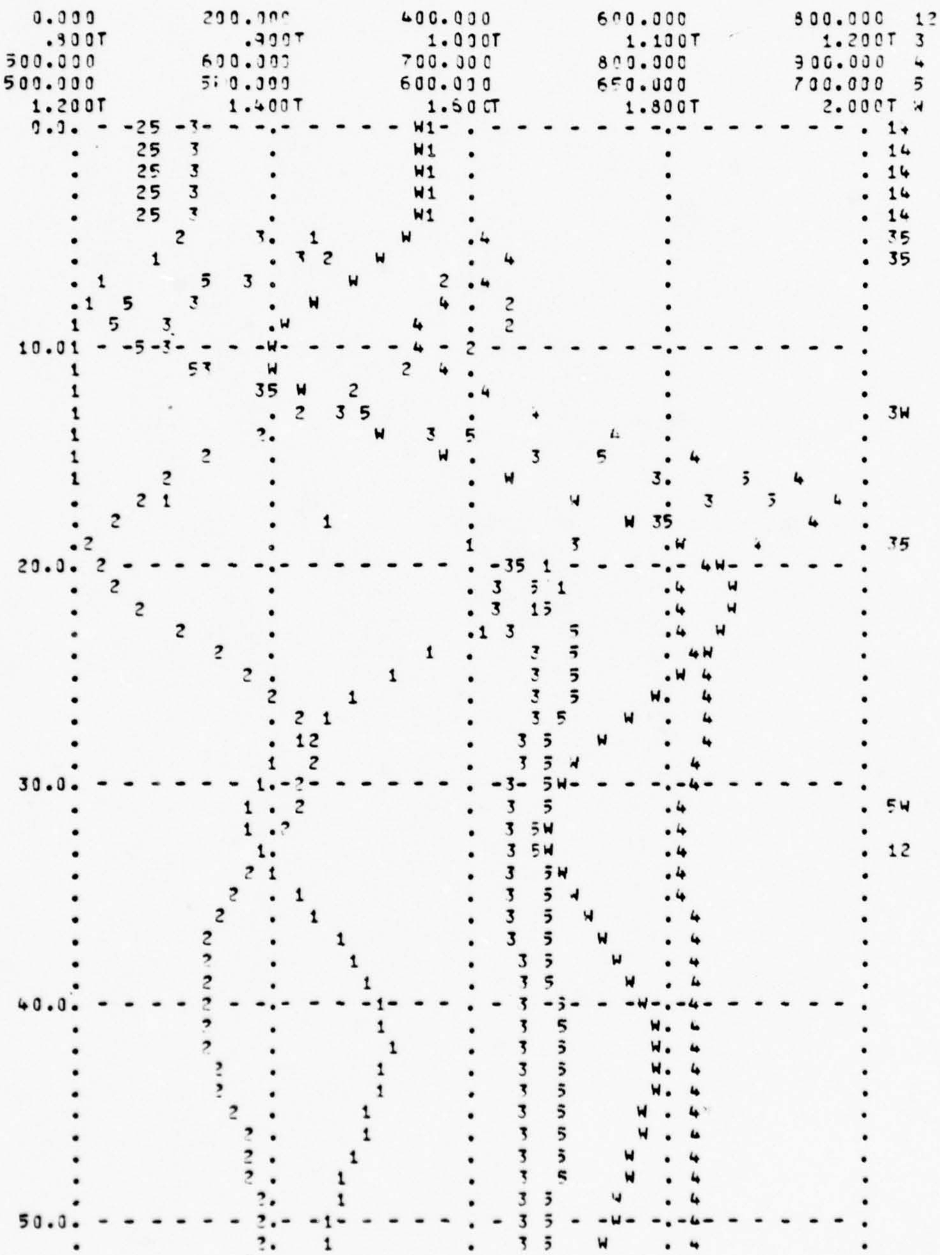
JOB(1)=S JOB(2)=I JOB(3)=F JOB(4)=B JOB(5)=A TOTFOR=T
FORSIZ=*

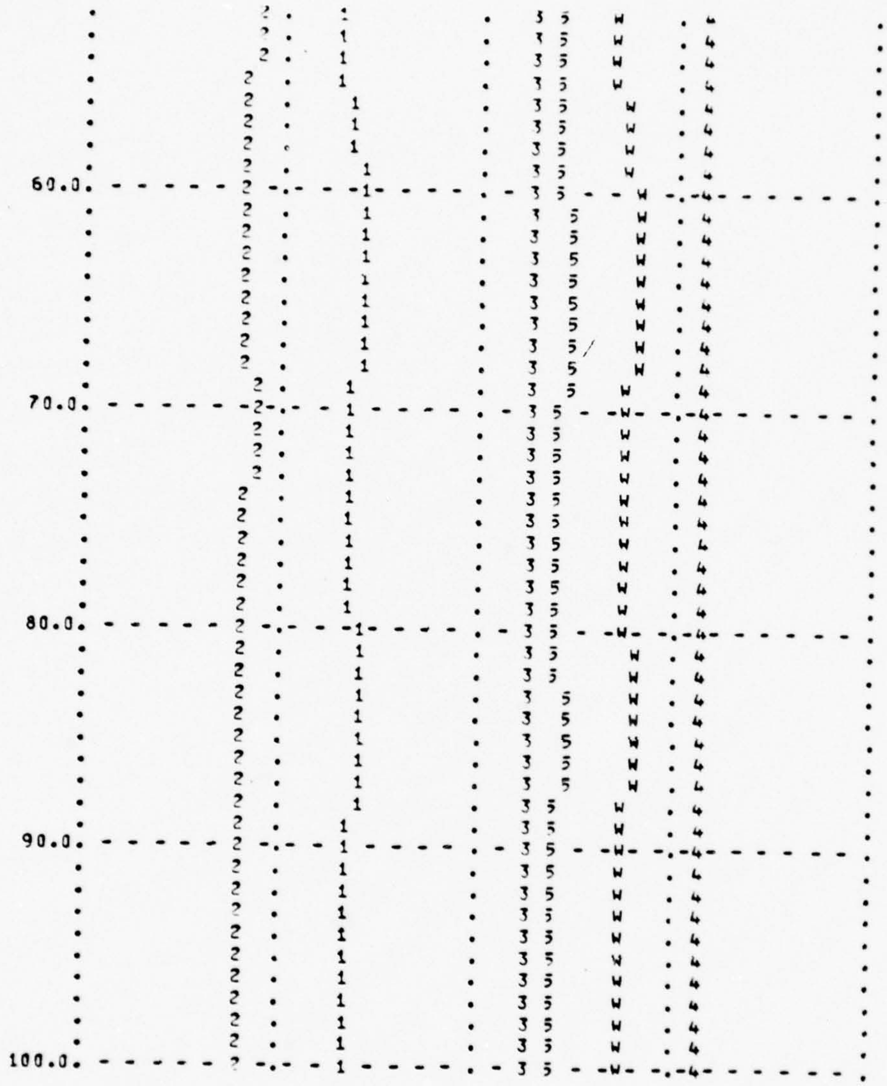
0.000T	1.000T	2.000T	3.000T	4.000T	S
0.000T	.500T	1.000T	1.500T	2.000T	I
4.000T	4.100T	4.200T	4.300T	4.400T	F
2.700T	2.800T	2.900T	3.000T	3.100T	B
3.300T	3.400T	3.500T	3.600T	3.700T	A
17.250T	17.750T	18.250T	18.750T	19.250T	T*


50.0
60.0
70.0
80.0
90.0
100.0

PAGE 44 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

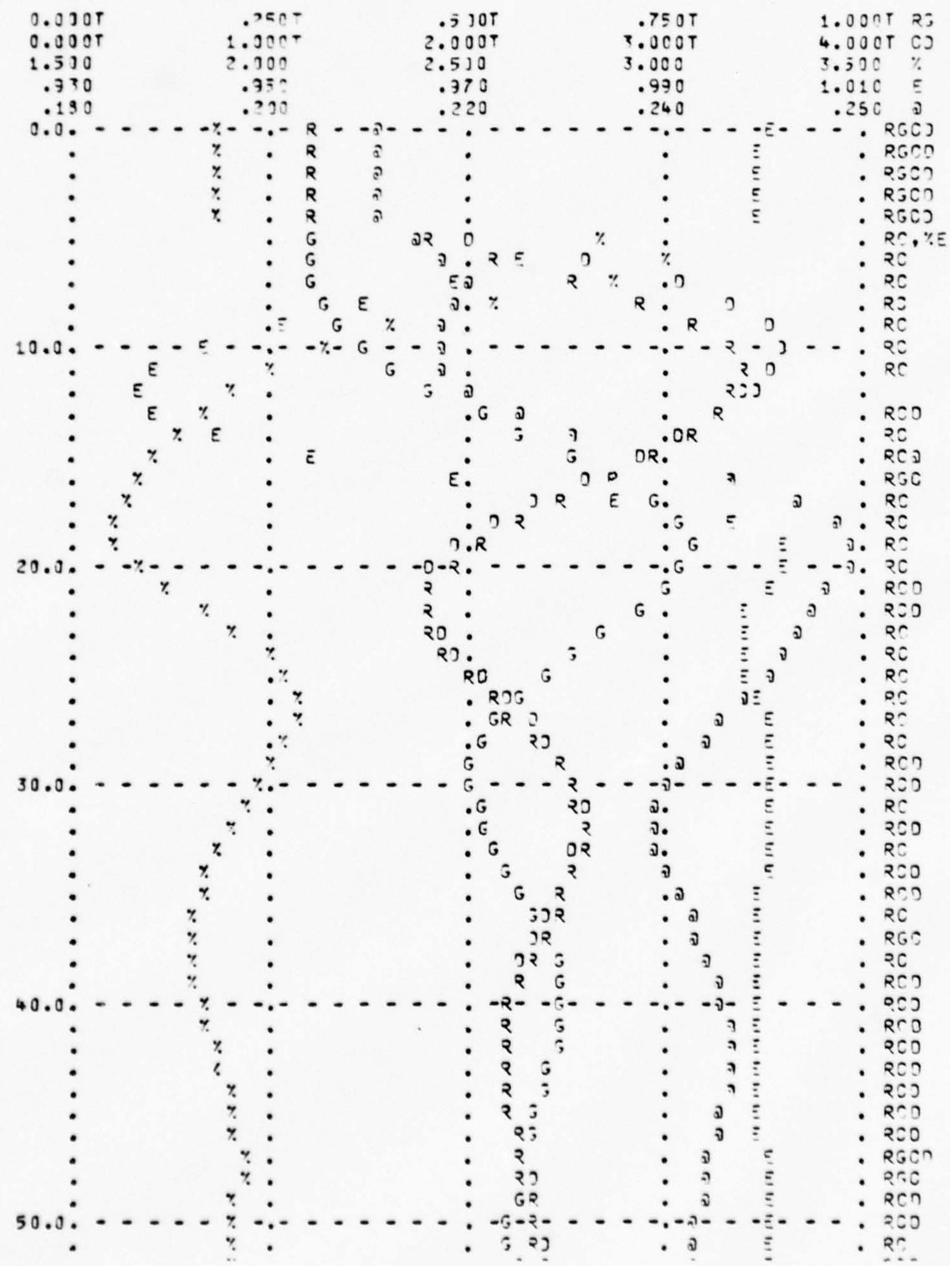
TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W

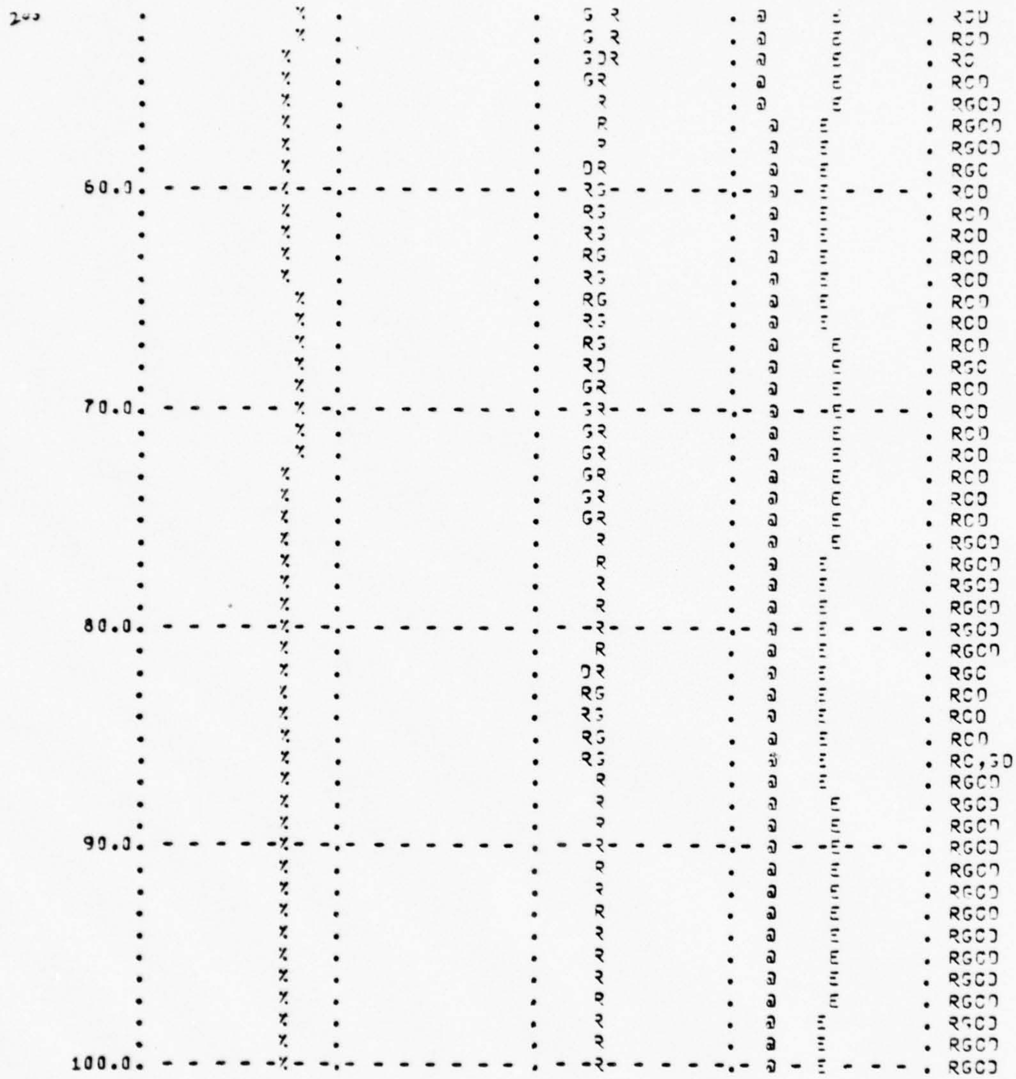



60.0
70.0
80.0
90.0
100.0

PAGE 45 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

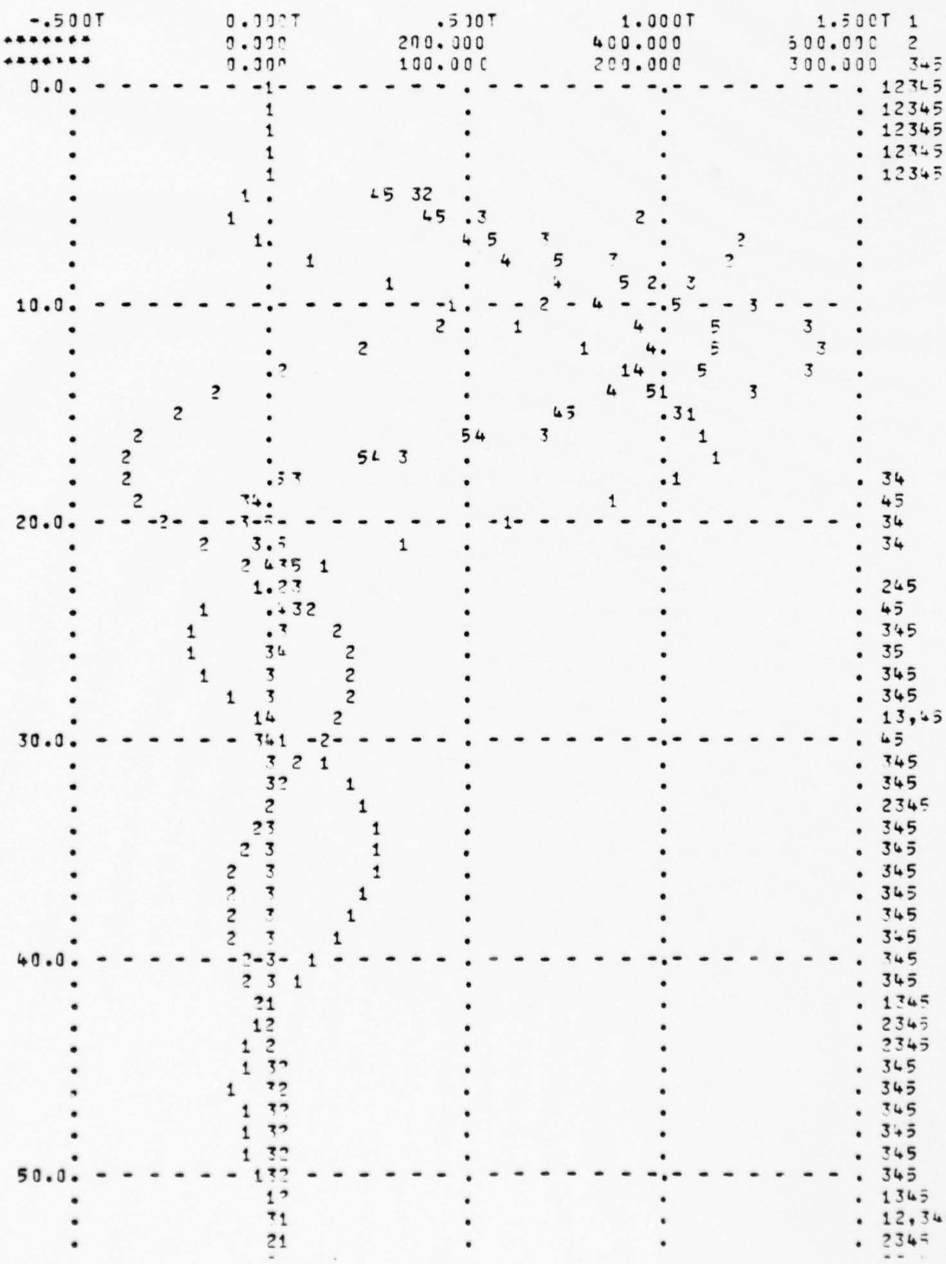
PRED=R UPT=G DSITE=C OCSIZE=D TFINS=% FOFFC=E TRNSFC=@

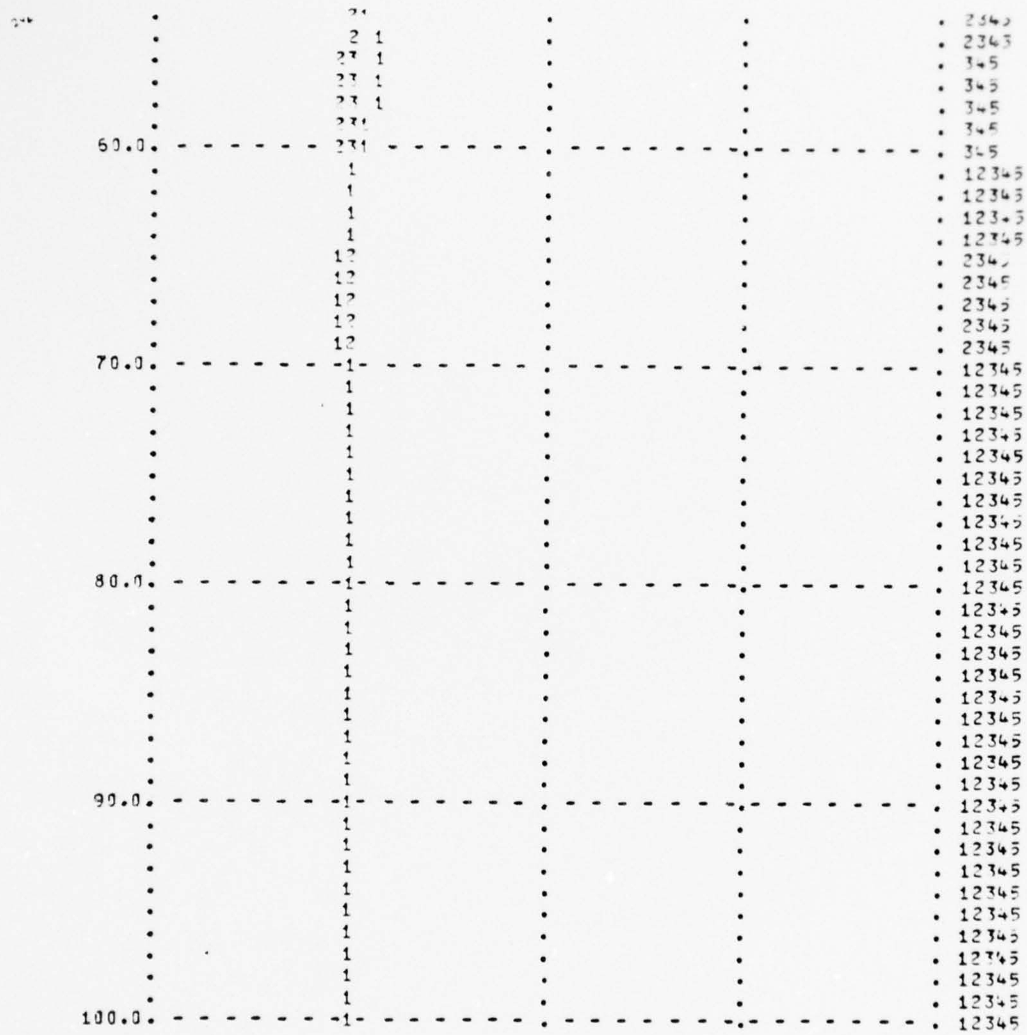




PAGE 46 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

DFDSC(1)=1 DFDSC(2)=2 DFDSC(3)=3 DFDSC(4)=4 DFDSC(5)=5




60.0
70.0
80.0
90.0
100.0

PAGE 47 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

```
CRATIO(3)=1  OCRATI(3)=2  CRATIO(4)=3  OCRATI(4)=4  CRATIO(5)=5
OCRATI(5)=6

   1.140          1.170          1.200          1.230          1.250   12
   2.700          2.800          2.900          3.000          3.100   34
   3.700          3.800          3.900          4.000          4.100   56
   0.0.- - - - - - - .- - - - - - - . - - - - - - -3- - - - -1- -  . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .    5 3       1         2     . 146
      .              .              .5 3     1     4         2     . 46
      .              .           5  3    1         4         2     . 46
      .              .     5     3  1              4         2     . 46
      .              5       3 1    .              4         2     . 46
  10.0.- - - - -5- - .- - 1 - - - - . - - - - - - -4- - - - -2- -  . 13,45
      .      5       .13            .              4         2     . 46
      .      5       13             .              4         2     . 46
      .        5     .13            .              4         2     . 46
      .            5 .    31        .              4         2     . 46
      .              .    5  3  1   .              4         2     . 46
      .              .            53.    1         4         2     . 46
      .              .              .      35      1         2     . 146
      .              .              .            354       1 2     . 46
      .              .              .              43        2 1   . 35,46
  20.0.- - - - - - - .- - - - - - - . - - - - - - -4-3- - - -2-1-  . 456
      .              .              .             543        21    . 46
      .              .              .            5 3        12     . 346
      .              .              .            534       1 2     . 46
      .              .              .             34       1 2     . 35,46
      .              .              .             34        12     . 35,46
      .              .              .             34         1     . 12,456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         21    . 3456
  30.0.- - - - - - - .- - - - - - - . - - - - - - -3- - - - -21-   . 3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
  40.0.- - - - - - - .- - - - - - - . - - - - - - -3- - - - -1- -  . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
  50.0.- - - - - - - .- - - - - - - . - - - - - - -3- - - - -1- -  . 12,3456
      .              .              .              3         1     . 12,3456
      .              .              .              3         1     . 12,3456
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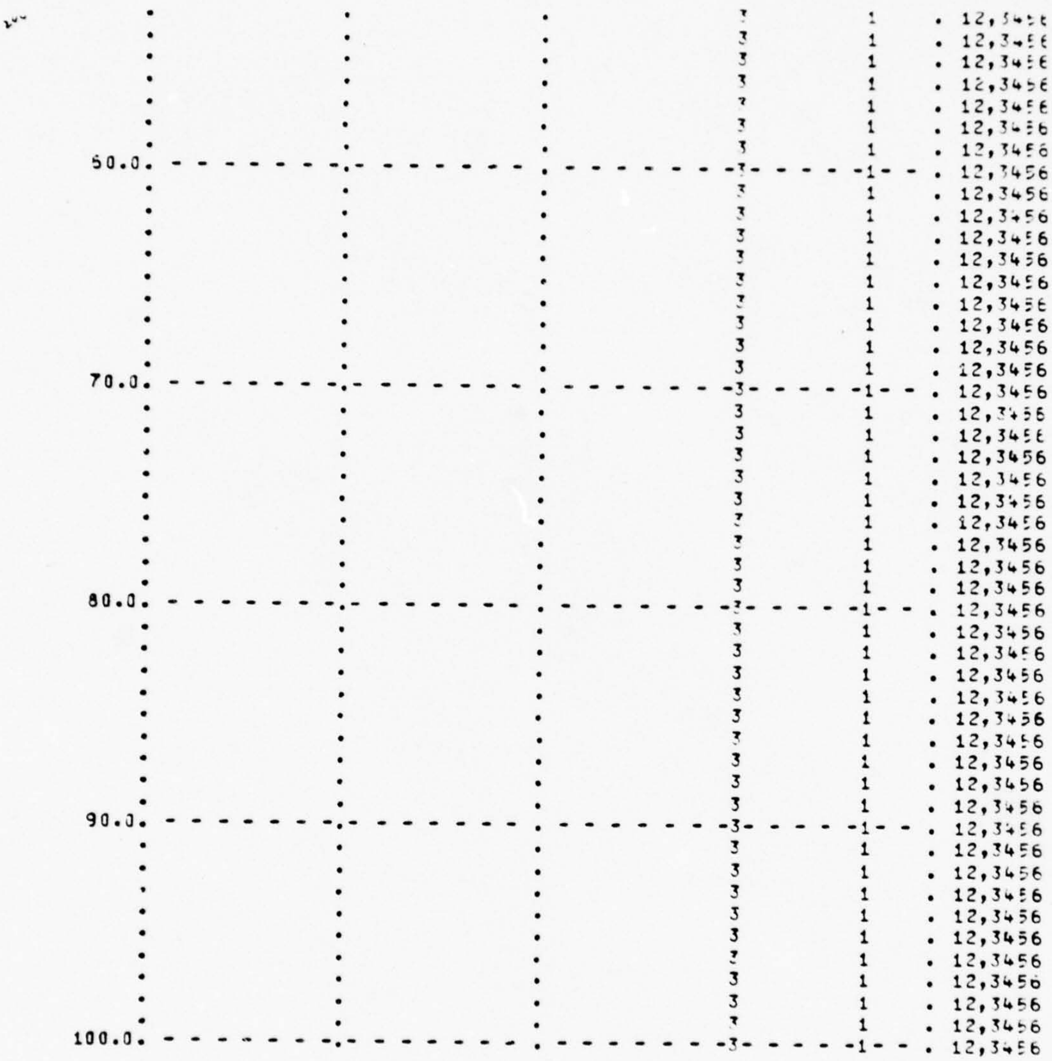
60.0
70.0
80.0
90.0
100.0
12,3456

CHANGES FOR RERUN -

ORIGINAL H4	0.000	0.000	0.000	0.000	0.000
PRESENT H4	1.500	1.500	1.500	1.500	1.500

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PAGE  49  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

  TIME        JOB      TRNG      NEED  OFORCE       ATT      WIND  OTMFOR
                2         2         2       2         2  TPINS   TOTFOR
                3         3         3       3         3    CAP   TODFOR
                4         4         4       4         4  TONEED   DSIZE
                5         5         5       5         5  FORCE   ODSIZE
             HFPR     OFOST      PATT  CRATIO    OCRATI     ATJ  AHOURS
                2         2      PREC       2         2       2        2
                3         3    TRNGFC       3         3       3        3
                4         4     FOSFC       4         4       4        4
                5         5      TDEL       5         5       5        5
            SCOST     RCOST      TRAV
            PCOST     ACOST
            TCOST    TOTCOS
            UCOST     OCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  E-00       E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-03    E-00      E-00    E-00    E 03
             E-00      E-00      E-00    E-00      E-00    E-00    E-00
             E-00      E-00      E-00    E-00      E-00    E-00    E 03
             E 05      E 05      E-00
             E 06      E 05
             E 06      E 05
             E 05      E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  0.00     3425.0    353.32        0.  3425.0     58.50  1540.8  11515.
            540.0     69.5      52.60   540.0    12.800  1.9800  13055.
           4375.0    859.?      452.1  4375.0     87.50  1.0000  15040.
           3000.0    582.00    310.00  3000.0     60.00  1136.9  1203.2
           3600.0    520.80    372.00  3600.0     72.00     0.0  1203.2
               0.       0.0    1203.2      0.        0.  12.000      0.
               0.      0.00    300.60      0.        0.  16.000      0.
           48.000      -.00    211.12  1.2500    1.2500  12.000  210.00
           25.000      -.00    1.0000  3.0000    3.0000  12.000  75000.
           30.000      -.00    7.0000  4.0000    4.0000  12.000  108.00
               0.      0.00    1.0000
             0.00      0.00
               0.        0.
               0.        0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

4.00	3425.0	353.92	0.	3425.0	171.25	1540.8	11515.
	640.0	63.52	52.80	640.0	32.000	1.8800	13055.
	4375.0	859.0	452.1	4375.0	218.75	1.0000	15040.
	3000.0	582.00	310.00	3000.0	150.00	1186.9	1203.2
	3600.0	520.80	372.00	3600.0	180.00	.0	1203.2
	0.	.0	1203.2	0.	0.	12.000	0.
	0.	.00	300.80	0.	0.	16.000	0.
	48.000	.00	211.12	1.2500	1.2500	12.000	210.00
	25.000	.00	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.00	7.0000	4.0000	4.0000	12.000	108.00
	453.	15.54	1.0000				
	12.33	3.01					
	1325.	2095.					
	283.	1998.					

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8.00	2268.2	7.37	0.	2204.8	100.83	1403.8	13003.
	1242.4	521.57	860.81	2028.1	55.231	2.8478	17559.
	4068.1	807.1	778.9	4375.0	190.34	1.1538	15208.
	2791.3	544.11	532.60	3000.0	124.08	2818.6	3538.3
	3341.3	676.65	646.30	3600.0	148.53	2132.2	4305.4
	0.	463.5	2114.3	0.	0.	10.560	0.
	0.	785.59	865.67	0.	0.	16.000	0.
	51.621	306.93	219.55	1.1623	1.2500	12.000	210.00
	26.869	203.72	.9295	2.7913	3.0000	12.000	75000.
	32.323	258.69	8.0768	3.7126	4.0000	12.000	108.00
	897.	47.19	.9558				
	24.21	9.61					
	2611.	4149.					
	560.	3769.					

- -

12.00	1368.6	.11	0.	1993.0	50.28	1363.1	13411.
	2086.4	378.33	520.99	2436.1	91.999	2.0352	15733.
	3833.6	798.3	988.0	4375.0	158.96	1.2123	15404.
	2631.7	530.25	675.09	3000.0	115.92	2999.6	4245.2
	3151.1	491.00	815.55	3500.0	138.79	2261.5	4520.4
	0.	624.3	2258.9	0.	0.	10.471	0.
	0.	349.67	988.87	0.	0.	16.000	0.
	54.779	541.39	218.80	1.0953	1.2500	12.000	210.00
	28.499	368.30	.8762	2.5317	3.0000	12.000	75000.
	34.274	443.94	8.4862	3.5012	4.0000	12.000	108.00
	1307.	96.33	1.0103				
	35.08	15.50					
	3817.	5182.					
	911.	5355.					

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PAGE 51 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

16.00	917.7	.00	0.	1330.5	42.51	1574.8	13029.
	2078.3	198.31	190.93	2054.0	35.467	1.7578	13375.
	3877.5	937.5	953.5	4375.0	130.02	1.1653	14919.
	2651.5	776.57	660.19	3000.0	123.10	2575.3	3653.3
	3207.3	507.54	770.62	3500.0	146.90	1239.3	3599.8
	0.	972.7	2300.5	0.	0.	10.882	0.
	0.	-24.27	887.45	0.	0.	16.000	0.
	54.157	497.33	245.62	1.1079	1.2500	12.000	210.00
	28.286	348.50	.8871	2.6515	3.0000	12.000	75000.
	33.673	392.70	8.1573	3.5637	4.0000	12.000	103.00
	1708.	146.0.	1.0838				
	46.59	21.22					
	5003.	8408.					
	1483.	5923.					
20.00	649.3	22.57	0.	1539.2	32.25	1866.8	12450.
	1635.1	80.45	41.68	1475.4	81.220	1.6320	17856.
	4224.9	1252.5	674.6	4375.0	209.96	1.0669	14030.
	2987.6	393.55	470.27	3000.0	143.43	1727.7	2555.6
	3494.1	759.47	541.11	3600.0	173.56	117.8	2525.9
	0.	990.0	2408.1	0.	0.	11.799	0.
	0.	-159.70	667.14	0.	0.	16.000	0.
	49.705	150.05	278.48	1.2071	1.2500	12.000	210.00
	25.974	112.45	.9664	2.8876	3.0000	12.000	75000.
	30.910	105.35	7.4680	3.3823	4.0000	12.000	103.00
	2124.	187.35	1.0826				
	60.44	27.41					
	6358.	11047.					
	2285.	8606.					
24.00	1516.2	475.09	0.	1732.5	77.51	1985.4	12131.
	1191.7	104.31	117.21	1155.7	50.999	1.8222	13907.
	4386.8	1097.0	564.1	4375.0	224.55	1.0171	13353.
	3014.7	376.72	381.13	3000.0	154.32	1537.9	2171.4
	3596.2	653.73	475.50	3600.0	134.08	-439.0	2159.6
	0.	215.7	2598.6	0.	0.	12.058	0.
	0.	-36.01	542.65	0.	0.	16.000	0.
	47.871	-11.75	275.13	1.2534	1.2500	12.000	210.00
	24.878	-14.57	1.0021	3.0147	3.0000	12.000	75000.
	30.032	3.81	7.1200	3.3958	4.0000	12.000	103.00
	2565.	218.03	.9895				
	76.04	34.10					
	8004.	14061.					
	3163.	10749.					

28.00	1915.7	216.07	0.	1588.4	95.99	1879.2	12331.
	1250.7	274.47	242.60	1356.2	32.556	2.0775	13154.
	4364.8	1115.3	569.9	4375.0	218.70	1.0598	14020.
	2991.7	982.37	405.62	3000.0	149.90	1720.2	2593.2
	3595.5	577.70	482.10	3600.0	130.15	-40.5	2711.0
	0.	-227.7	2751.5	0.	0.	11.875	0.
	0.	105.56	649.56	0.	0.	16.000	0.
	48.112	10.22	263.28	1.2471	1.2500	12.000	210.00
	25.059	9.22	.9979	2.9917	3.0000	12.000	75000.
	30.038	4.52	7.4168	3.9950	-.0000	12.000	108.00
	3024.	248.12	.9873				
	91.50	41.12					
	9691.	15992.					
	3895.	11834.					
32.00	1508.0	93.05	0.	1651.4	73.79	1747.7	12525.
	1584.4	311.75	229.18	1650.0	77.527	1.9776	13870.
	4381.0	1102.1	575.9	4375.0	214.37	1.1133	14276.
	3004.3	176.75	394.67	3000.0	147.01	1675.0	3133.3
	3603.3	567.30	475.27	3600.0	176.32	411.6	3185.9
	0.	143.4	2774.3	0.	0.	11.951	0.
	0.	65.55	783.32	0.	0.	16.000	0.
	47.935	-5.97	253.78	1.2517	1.2500	12.000	210.00
	24.964	-4.3[illegible]	1.0012	3.0043	3.0000	12.000	75000.
	29.973	-3.29	7.7933	4.0036	4.0000	12.000	108.00
	3481.	285.45	.9813				
	106.05	48.19					
	11276.	19631.					
	4485.	13157.					
36.00	1227.7	114.99	0.	1663.7	50.19	1753.6	12630.
	1706.9	239.84	163.04	1584.5	33.679	1.8451	13554.
	4375.7	1097.5	578.9	4375.0	214.51	1.1149	14323.
	3000.8	170.82	396.71	3000.0	147.11	1614.9	3143.4
	3600.7	665.02	476.24	3600.0	176.52	371.4	3120.0
	0.	435.0	2748.6	0.	0.	12.023	0.
	0.	-22.39	787.35	0.	0.	16.000	0.
	47.992	-.71	254.21	1.2502	1.2500	12.000	210.00
	24.993	-.79	1.0002	3.0008	3.0000	12.000	75000.
	29.995	-.55	7.8046	4.0007	4.0000	12.000	108.00
	3931.	326.35	1.0078				
	119.37	55.02					
	12783.	22292.					
	5075.	14275.					

PAGE 53 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

40.00	1337.9	223.77	0.	1663.4	55.74	1840.4	12503.
	1582.1	177.07	128.52	1527.7	78.924	1.7956	13779.
	4371.4	1104.3	583.5	4375.0	218.07	1.0841	14172.
	2997.2	377.05	400.39	3000.0	149.52	1592.2	2340.7
	3597.4	669.97	479.78	3600.0	179.47	42.5	2730.6
	0.	331.5	2748.1	0.	0.	12.043	0.
	0.	-54.31	710.19	0.	0.	16.000	0.
	48.040	3.61	260.56	1.2490	1.2500	12.000	210.00
	25.024	2.97	.9992	2.9972	3.0000	12.000	75000.
	30.021	2.55	7.5885	3.9972	4.0000	12.000	103.00
	4379.	366.07	1.0135				
	134.33	61.85					
	14311.	25000.					
	5749.	15324.					
44.00	1633.3	278.65	0.	1661.2	82.37	1896.2	12381.
	1427.1	179.81	146.74	1406.3	71.958	1.8473	13049.
	4371.3	1111.7	566.0	4375.0	220.45	1.0636	14042.
	2997.3	382.51	401.93	3000.0	151.16	1615.5	2535.2
	3597.3	673.92	481.91	3600.0	181.41	-152.6	2522.4
	0.	27.3	2785.2	0.	0.	12.011	0.
	0.	-20.77	659.04	0.	0.	16.000	0.
	48.041	3.77	263.67	1.2489	1.2500	12.000	210.00
	25.023	2.71	.9992	2.9973	3.0000	12.000	75000.
	30.023	2.77	7.4453	3.9970	4.0000	12.000	103.00
	4833.	401.32	1.0068				
	149.31	69.83					
	15904.	27825.					
	6463.	15315.					
48.00	1763.0	245.82	0.	1641.1	88.57	1879.6	12407.
	1409.0	223.22	182.14	1431.6	70.784	1.9199	13153.
	4374.6	1111.3	584.4	4375.0	219.77	1.0705	14048.
	2999.8	392.95	400.73	3000.0	150.70	1648.2	2705.1
	3599.7	573.96	480.95	3600.0	180.84	-90.6	2730.4
	0.	-121.3	2821.0	0.	0.	11.977	0.
	0.	22.55	676.27	0.	0.	16.000	0.
	48.004	.35	261.82	1.2499	1.2500	12.000	210.00
	25.002	.27	.9999	2.9998	3.0000	12.000	75000.
	30.003	.34	7.4936	3.9996	4.0000	12.000	103.00
	5292.	435.35	.9964				
	164.46	75.39					
	17530.	30663.					
	7165.	17215.					

52.00	1677.3	193.41	0.	1534.3	83.57	1835.1	12437.
	1496.2	246.51	189.94	1521.6	74.544	1.9204	13037.
	4375.8	1107.8	582.1	4375.0	218.06	1.0873	14131.
	3001.4	179.53	399.07	3000.0	149.53	1650.3	2873.3
	3601.2	671.6	479.20	3500.0	179.42	58.2	2335.7
	0.	-43.0	2827.5	0.	0.	11.980	0.
	0.	25.41	716.32	0.	0.	16.000	0.
	47.980	-1.31	258.51	1.2505	1.2500	12.000	210.00
	24.989	-1.37	1.0004	3.0014	3.0000	12.000	75000.
	29.990	-1.25	7.6113	4.0014	4.0000	12.000	108.00
	5751.	472.14	.9936				
	179.32	83.05					
	19136.	33436.					
	7814.	18011.					
56.00	1562.0	184.21	0.	1641.0	77.66	1820.9	12532.
	1556.5	232.73	173.12	1557.4	77.383	1.8803	13339.
	4376.1	1105.5	581.8	4375.0	217.56	1.0927	14173.
	3000.8	177.81	398.93	3000.0	149.18	1632.7	2325.8
	3600.8	670.41	478.84	3600.0	179.01	108.9	2324.6
	0.	79.1	2815.7	0.	0.	12.002	0.
	0.	.87	731.71	0.	0.	16.000	0.
	47.988	-1.09	257.62	1.2503	1.2500	12.000	210.00
	24.993	-.30	1.0002	3.0008	3.0000	12.000	75000.
	29.993	-.80	7.6488	4.0009	4.0000	12.000	108.00
	6208.	509.98	.9988				
	193.92	90.02					
	20712.	36165.					
	8451.	18720.					
60.00	1552.9	211.51	0.	1646.5	77.51	1840.8	12499.
	1538.5	211.29	158.74	1523.5	75.793	1.8561	13335.
	4374.4	1106.3	583.1	4375.0	218.35	1.0855	14145.
	2999.6	378.72	399.86	3000.0	149.72	1621.4	2355.5
	3599.6	571.10	479.71	3600.0	179.68	32.2	2340.7
	0.	93.5	2808.5	0.	0.	12.013	0.
	0.	-14.34	713.87	0.	0.	16.000	0.
	48.005	.55	259.16	1.2498	1.2500	12.000	210.00
	25.004	.43	.9999	2.9996	3.0000	12.000	75000.
	30.003	.37	7.5988	3.9996	4.0000	12.000	108.00
	5664.	547.59	1.0034				
	208.55	97.10					
	22283.	38909.					
	9108.	19365.					

64.00	1624.8	234.29	0.	1644.9	81.42	1861.9	12456.
	1490.5	206.31	160.08	1490.8	74.593	1.8647	13052.
	4373.9	1108.3	564.1	4375.0	213.18	1.0779	14101.
	2999.2	380.47	400.54	3000.0	150.29	1625.2	2773.4
	3599.2	572.33	480.50	3600.0	180.36	-42.4	2771.6
	0.	20.1	2814.0	0.	0.	12.007	0.
	0.	-9.71	694.85	0.	0.	16.000	0.
	48.012	1.09	260.57	1.2497	1.2500	12.000	210.00
	25.007	.81	.9998	2.9992	3.0000	12.000	75000.
	30.006	.73	7.5456	3.9991	4.0000	12.000	108.00
	7120.	584.30	1.0028				
	223.36	104.17					
	23870.	41687.					
	9785.	19956.					
68.00	1676.8	231.51	0.	1539.5	84.02	1862.9	12451.
	1472.6	215.91	170.03	1476.1	73.787	1.8862	13038.
	4374.7	1109.5	583.9	4375.0	219.21	1.0778	14031.
	2999.8	381.00	400.38	3000.0	150.31	1634.7	2777.6
	3599.7	672.71	480.44	3600.0	180.38	-41.3	2732.3
	0.	-37.3	2823.5	0.	0.	11.996	0.
	0.	3.50	694.40	0.	0.	16.000	0.
	48.004	.35	260.48	1.2499	1.2500	12.000	210.00
	25.002	.25	.9999	2.9998	3.0000	12.000	75000.
	30.002	.27	7.5443	3.9997	4.0000	12.000	108.00
	7578.	520.37	.9997				
	238.28	111.21					
	25471.	44480.					
	10461.	20493.					
72.00	1665.5	215.98	0.	1636.7	83.26	1850.6	12475.
	1491.6	226.25	175.06	1499.6	74.552	1.8930	13037.
	4375.4	1108.3	583.2	4375.0	218.72	1.0824	14111.
	3000.3	380.25	399.67	3000.0	149.98	1638.0	2823.6
	3600.3	572.14	479.93	3600.0	179.97	4.3	2831.1
	0.	-28.9	2826.8	0.	0.	11.993	0.
	0.	8.05	705.89	0.	0.	16.000	0.
	47.995	-.44	259.54	1.2501	1.2500	12.000	210.00
	24.997	-.37	1.0001	3.0003	3.0000	12.000	75000.
	29.998	-.30	7.5765	4.0003	4.0000	12.000	108.00
	8035.	556.70	.9981				
	253.14	118.28					
	27071.	47253.					
	11124.	20977.					

76.00	1628.6	208.38	0.	1639.2	81.31	1842.3	12431.
	1513.8	225.17	171.86	1516.4	75.573	1.8838	13054.
	4375.4	1107.7	582.9	4375.0	218.43	1.0852	14130.
	3000.3	379.50	399.68	3000.0	149.79	1634.1	2351.7
	3600.3	671.57	479.67	3600.0	179.74	29.6	2353.3
	0.	9.5	2823.7	0.	0.	11.999	0.
	0.	2.57	712.93	0.	0.	16.000	0.
	47.995	-.45	259.03	1.2501	1.2500	12.000	210.00
	24.997	-.33	1.0001	3.0003	3.0000	12.000	75000.
	29.997	-.32	7.5962	4.0004	4.0000	12.000	108.00
	8494.	593.62	.9991				
	267.30	125.34					
	28661.	50021.					
	11773.	21412.					
80.00	1614.6	214.02	0.	1640.5	80.56	1846.0	12437.
	1515.2	218.85	166.93	1511.8	75.596	1.8744	13043.
	4375.0	1107.6	583.2	4375.0	218.56	1.0840	14127.
	3000.0	379.53	399.88	3000.0	149.87	1629.8	2340.0
	3600.0	671.57	479.64	3600.0	179.85	16.1	2335.3
	0.	25.2	2820.3	0.	0.	12.003	0.
	0.	-3.41	710.01	0.	0.	16.000	0.
	48.000	.01	259.30	1.2500	1.2500	12.000	210.00
	25.000	.02	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.00	7.5880	4.0000	4.0000	12.000	108.00
	8951.	730.65	1.0006				
	282.65	132.38					
	30246.	52782.					
	12439.	21805.					
84.00	1629.7	221.77	0.	1640.8	91.52	1852.7	12474.
	1502.3	215.71	165.93	1498.7	75.149	1.8742	13057.
	4374.7	1108.4	583.5	4375.0	218.83	1.0816	14115.
	2999.8	380.01	400.12	3000.0	150.05	1629.6	2315.7
	3599.8	672.02	480.10	3600.0	180.06	-7.9	2312.6
	0.	11.1	2820.5	0.	0.	12.003	0.
	0.	-3.67	703.93	0.	0.	16.000	0.
	48.003	.23	259.78	1.2499	1.2500	12.000	210.00
	25.002	.22	.9999	2.9998	3.0000	12.000	75000.
	30.002	.21	7.5710	3.9998	4.0000	12.000	108.00
	9408.	757.47	1.0010				
	297.45	139.43					
	31835.	55552.					
	13105.	22153.					

88.00	1647.8	223.15	0.	1639.5	82.45	1854.8	12453.
	1493.8	217.73	168.39	1493.7	74.745	1.8801	13073.
	4374.8	1103.7	583.5	4375.0	218.90	1.0808	14108.
	2999.9	380.23	400.14	3000.0	150.11	1632.2	2803.4
	3599.9	572.21	480.15	3600.0	180.13	-14.2	2803.8
	0.	-8.3	2822.9	0.	0.	12.000	0.
	0.	-.03	702.10	0.	0.	16.000	0.
	48.002	.17	259.89	1.2500	1.2500	12.000	210.00
	25.001	.17	1.0000	2.9999	3.0000	12.000	75000.
	30.001	.17	7.5659	3.9999	4.0000	12.000	108.00
	9865.	803.95	1.0002				
	312.28	146.49					
	33429.	58330.					
	13772.	22487.					

92.00	1649.5	219.23	0.	1638.4	82.49	1852.0	12474.
	1496.5	220.92	170.47	1498.8	74.343	1.8836	13074.
	4375.1	1103.5	583.4	4375.0	218.79	1.0819	14112.
	3000.1	380.15	400.01	3000.0	150.03	1633.9	2813.0
	3600.0	672.10	480.03	3600.0	180.03	-3.2	2821.2
	0.	-11.1	2824.4	0.	0.	11.998	0.
	0.	2.20	704.75	0.	0.	16.000	0.
	47.999	-.09	259.67	1.2500	1.2500	12.000	210.00
	25.000	-.05	1.0000	3.0001	3.0000	12.000	75000.
	30.000	-.05	7.5733	4.0001	4.0000	12.000	108.00
	10323.	340.57	.9995				
	327.11	153.35					
	35023.	51105.					
	14437.	22780.					

96.00	1639.6	216.07	0.	1638.6	81.95	1849.0	12430.
	1503.5	221.53	170.18	1504.9	75.150	1.8821	13055.
	4375.1	1108.2	583.2	4375.0	218.58	1.0830	14119.
	3000.1	379.91	399.92	3000.0	149.95	1633.2	2823.8
	3600.1	671.93	479.92	3600.0	179.94	7.0	2830.9
	0.	-1.0	2823.9	0.	0.	11.999	0.
	0.	1.34	707.46	0.	0.	16.000	0.
	47.998	-.13	259.46	1.2500	1.2500	12.000	210.00
	24.999	-.11	1.0000	3.0001	3.0000	12.000	75000.
	29.999	-.11	7.5809	4.0001	4.0000	12.000	108.00
	10781.	377.25	.9996				
	341.91	160.62					
	36615.	63974.					
	15098.	23045.					

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PAGE  58  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

 100.00   1632.8   216.62        0.   1539.3    31.51   1849.0   12430.
          1505.9   213.97   168.74   1505.4   75.272   1.8790   13059.
          4375.0   1108.1    563.3   4375.0   218.68   1.0830   14120.
          3000.0   379.85   399.94   3000.0   149.95   1631.9   2329.7
          3600.0   571.89   479.93   3600.0   179.34      6.3   2329.0
              0.      6.3   2822.7       0.       0.   12.001       0.
              0.     -.55   707.42       0.       0.   16.000       0.
          48.000     -.04   259.48   1.2500   1.2500   12.000   210.00
          25.000     -.03   1.0000   3.0000   3.0000   12.000   75000.
          30.000     -.03   7.5808   4.0000   4.0000   12.000   103.00
          11239.   314.04   1.0001
          356.70   167.67
          38206.   55643.
          15760.   23284.
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PAGE 59 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

JOB(1)=S JOB(2)=I JOB(3)=F JOB(4)=B JOB(5)=A TOTFOR=T
FORSIZ=*

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   0.000T            1.000T            2.000T            3.000T            4.000T SI
   3.500T            3.800T            4.000T            4.200T            4.400T F
   2.400T            2.500T            2.800T            3.000T            3.200T B
   3.000T            3.200T            3.400T            3.600T            3.800T A
  15.000T           17.000T           18.000T           19.000T           20.000T T*
 0.0. - - - - - I - -.- - - - - - - - . - - - - - - - -BT - -S- - - F . BA,T*
    .           I     .                 .                 BT     S        F . BA,T*
    .           I     .                 .                 BT     S        F . BA,T*
    .           I     .                 .                 BT     S        F . BA,T*
    .           I     .                 .                 BT     S        F . BA,T*
    .           I     .                 .        ABT      .*   SF           .
    .            I    .                 .    TAB          S*                . SF
    .                I.               T A  B       SF     .*                .
    .                 .    I     T A   B.    SF           .*                .
    .                 .    T A I   B    S                 .*                . SF
10.0. - - - - - - - -.TA- - B -FSI- . - - - - - - - -.* - - - - - - - .
    .              A  .     F  S       I.                 .*                . FB,AT
    .            A    . BF   S          .I                .*                . AT
    .           TA    .F S              . I               .*                . FB
    .           TA    .FS               . I               .*                . FB
    .            T A S BF               . I               .*                .
    .               TS.A   B F          .I                .*                .
    .               S .T    A  B  F     I                 .*                .
    .             S   .     T      AB I .F                .*                .
    .            S    .          T I    AB         F      .*                .
20.0. - - - - S - -.- - - - - -I- T . - - - -B- - - - -.*F- - - - - - - . BA
    .           S     .         I       . T           BA  .*         =      .
    .              S  .       I         .       T         B*              F . BA
    .                 .   SI            .            T    AB              =   B*
    .                 .   I     S       .                TAB              =. B*
    .                 . I          S    .                ABT              F . T*
    .                 . I              S.                AB*T           F   .
    .                 .   I            S.                B.*  T         F   . BA
    .                 .    I           S.                BA*T           F   .
    .                 .     I         S .                 B*T             F . BA
30.0. - - - - - - - -.- - -I- - S - . - - - - - - - -BT - - - - - - F . BA,T*
    .                 .         IS      .                TB*              F . BA
    .                 .         SI      .               T B*               F. BA
    .                 .       S    I    .              T  B*               F. BA
    .                 .     S     I     .             T   B*              F . BA
    .                 .    S       I    .           T     B*              F . BA
    .                 .   S        I    .           T     B*              F . BA
    .                 .   S       I     .           T     B*              F . BA
    .                 .    S      I     .           T     B*              F . BA
    .                 .    S     I      .            T    B*              F . BA
40.0. - - - - - - - -.- - S - I - - . - - - - - - - T -B* - - - - - - F . BA
    .                 .       S I       .               T B*              F . BA
    .                 .        S        .                TB*              F . SI,BA
    .                 .       IS        .                 B*              F . BAT
    .                 .      I   S      .                 BT              F . BA,T*
    .                 .      I     S    .                 BT              F . BA,T*
    .                 .      I      S   .                 B*T             F . BA
    .                 .      I      S   .                 B*T             F . BA
    .                 .      I      S   .                 B*T             F . BA
    .                 .      I      S   .                 B*T             F . BA
50.0. - - - - - - - -.- - - I - S - . - - - - - - - -B*T- - - - - F . BA
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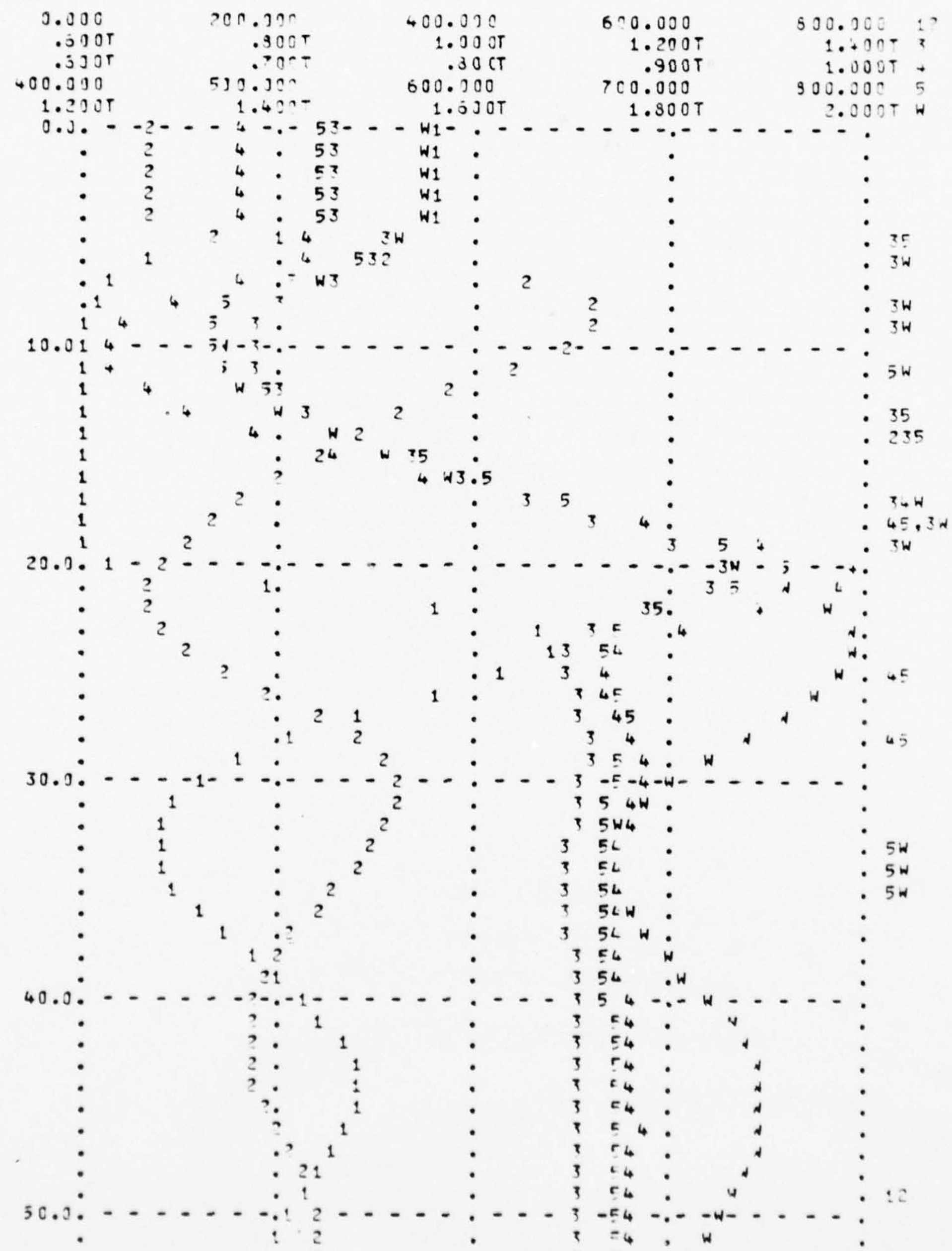
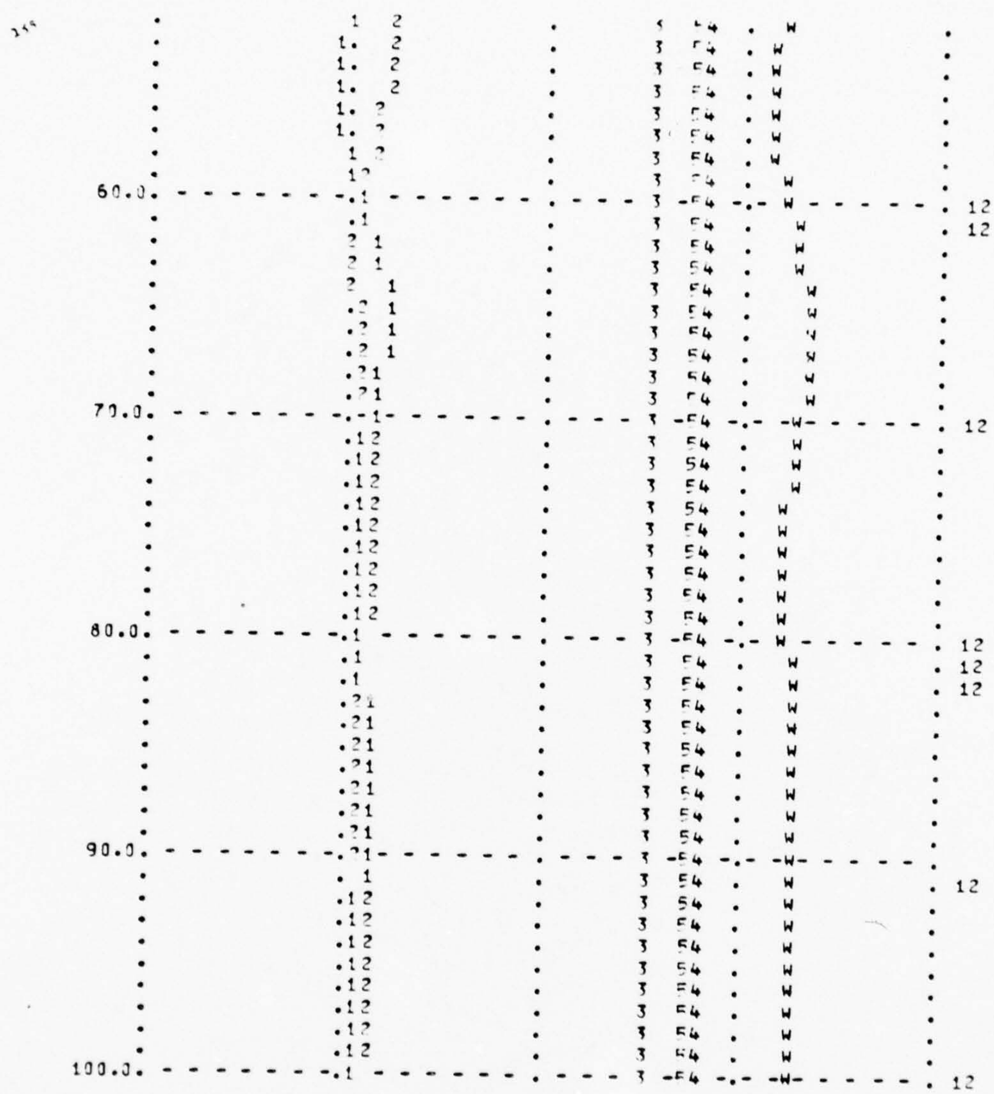
     .                .       I   S   .                B*T           F . BA
     .                .       I  S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        IS     .                B*            F . BAT
     .                .        IS     .                B*            F . BAT
     .                .         S     .                B*            F . SI,BAT
     .                .         S     .                B*            F . SI,BAT
     .                .         S     .                B*            F . SI,BAT
     .                .         S     .                B*            F . SI,BAT
 60.0. - - - - - - - -.- - - - -S- -  . - - - - - - - -B* - - - - - -F . SI,BAT
     .                .        IS     .                B*            F . BAT
     .                .        IS     .                B*            F . BAT
     .                .        IS     .                BT            F . BA,T*
     .                .       I S     .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                B*T           F . BA
 70.0. - - - - - - - -.- - -  I -S- - . - - - - - - - -BT - - - - - -F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
 80.0. - - - - - - - -. - - - -IS - - . - - - - - - - -BT - - - - - -F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .        IS     .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
 90.0. - - - - - - - -.- - -  I -S- - . - - - - - - - -BT - - - - - -F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .       I  S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
     .                .        I S    .                BT            F . BA,T*
100.0. - - - - - - - -. - - - -IS - - . - - - - - - - -BT - - - - - -F . BA,T*
```

PAGE 50 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

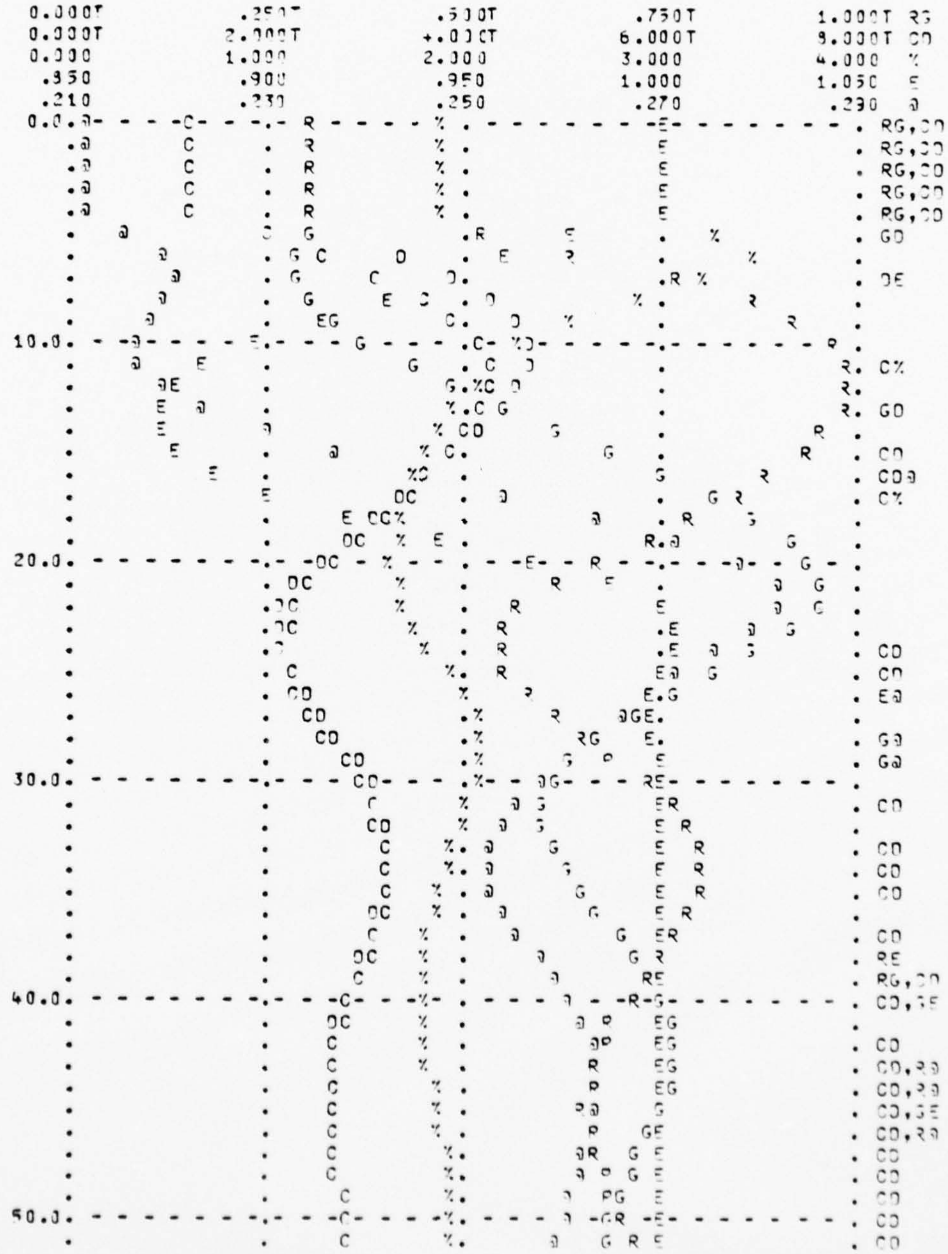
TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W

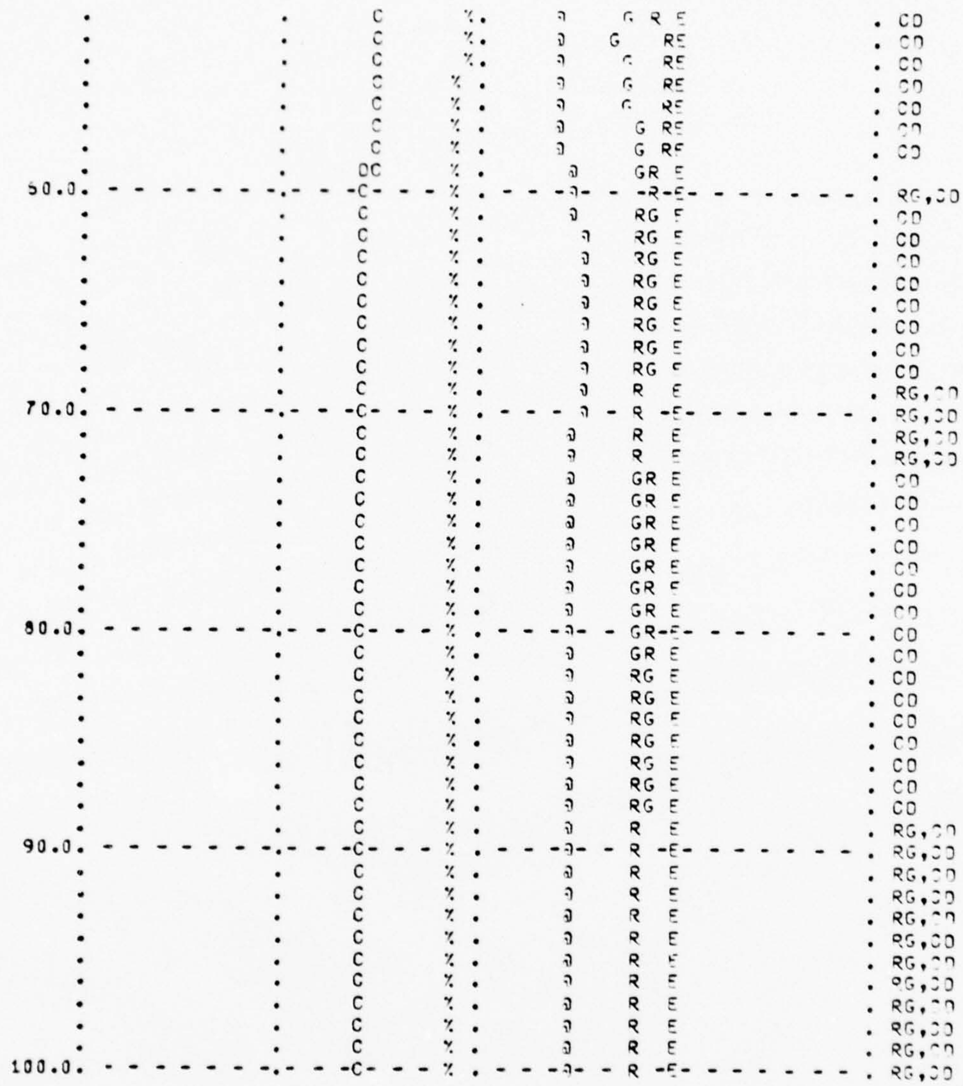



60.0
70.0
80.0
90.0
100.0

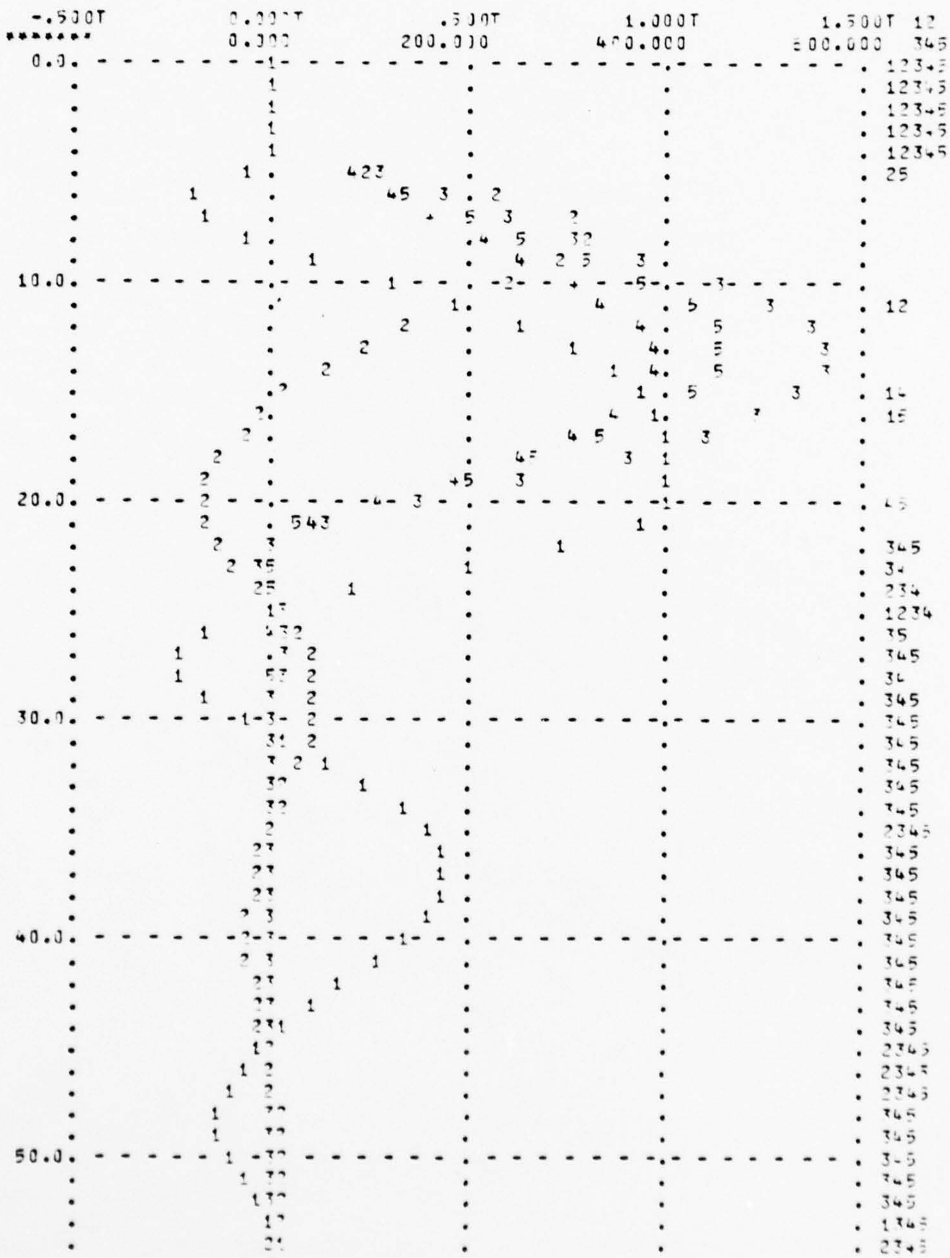
PAGE 51 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

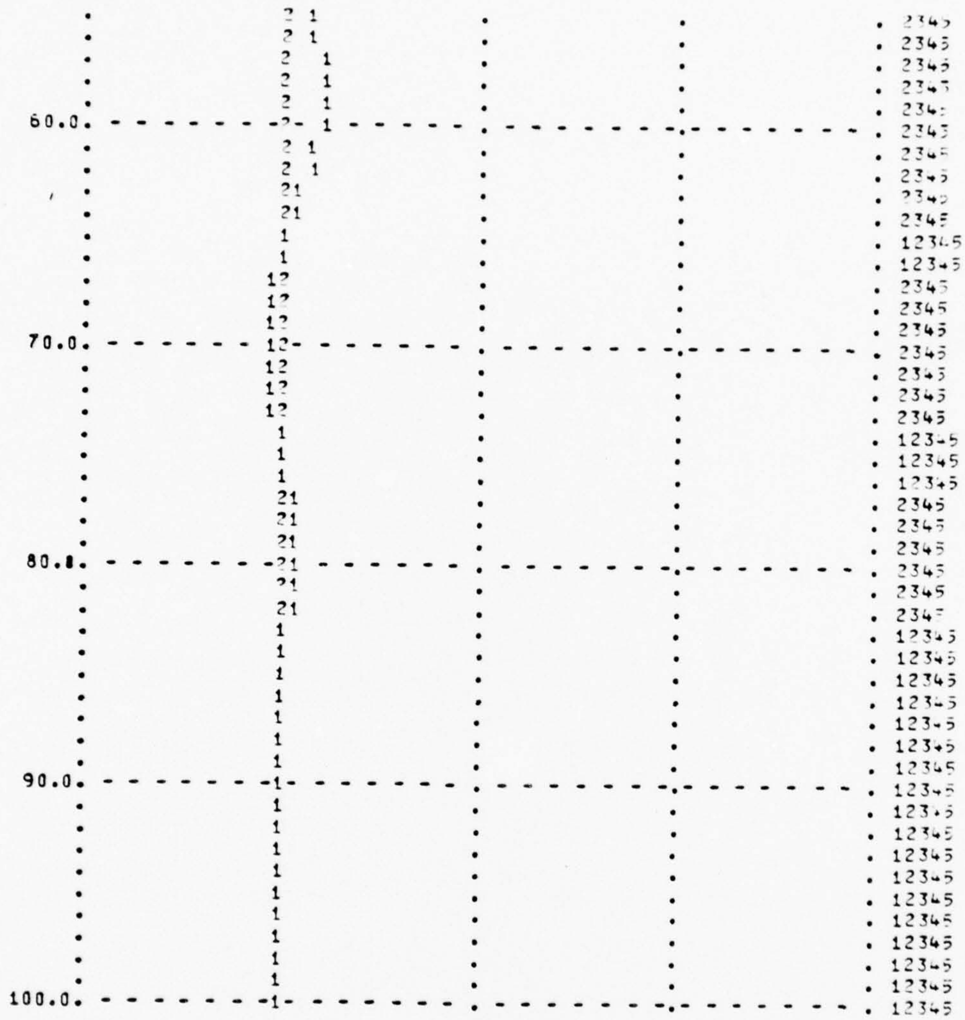
PREC=R UPT=G CSIZE=C OCSIZE=D TRINS=% FOEFC=E TRNSFC=@





DFDSC(1)=1 DFDSC(2)=2 DFDSC(3)=3 DFDSC(4)=4 DFDSC(5)=5




60.0
70.0
80.0
90.0
100.0

```
PAGE  53  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

CRATIO(3)=1  DCRATI(3)=2  CRATIO(4)=3  DCRATI(4)=4  CRATIO(5)=5
DCRATI(5)=6

1.075               1.125               1.175               1.225               1.275  12
2.400               2.600               2.800               3.000               3.200  3-
3.400               3.600               3.800               4.000               4.200  56
 0.0. - - - - - - - .- - - - - - - - .- - - - - - - - -3- - - 21- - - - . 3456
     .                .                 .                 3        1        . 12,3456
     .                .                 .                 3        1        . 12,3456
     .                .                 .                 3        1        . 12,3456
     .                .                 .                 3        1        . 12,3456
     .                .                 .        53    1 4        2        . 46
     .                .                 .    5 3 1     4        2        . 46
     .                .              5. 13          4        2        . 46
     .                .         5   1  3.           4        2        . 46
     .                .  5 1       3    .           4        2        . 46
10.0. - - - - -51.- - - 3 - - - .- - - - - - - - -4- - - 2 - - - - . 46
     .       15       .   3             .           4        2        . 46
     .    1 5         . 3               .           4        2        . 46
     .  1  5          .3                .           4        2        . 46
     .  1  5          .3                .           4        2        . 46
     .    1  5        . 3               .           4        2        . 46
     .        1 5     .     3           .           4        2        . 46
     .                1 5      3        .           4        2        . 46
     .                .        1     3  .           4        2        . 15,46
     .                .              513            4        2        . 46
20.0. - - - - - - - .- - - - - - - - .- - - 53- 1 - -4- - - 2 - - - - . 46
     .                .                 .       3  4    1   2        . 35,46
     .                .                 .           3       21       . 3456
     .                .                 .           43      2 1      . 456
     .                .                 .           43      2 1      . 456
     .                .                 .           53      1        . 12,3456
     .                .                 .           53     12        . 346
     .                .                 .           34     12        . 35,46
     .                .                 .           34      1        . 12,456
     .                .                 .           3       1        . 12,3456
30.0. - - - - - - - .- - - - - - - - .- - - - - - - - -3- - - 21- - - - . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
40.0. - - - - - - - .- - - - - - - - .- - - - - - - - -3- - - 1 - - - - . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       1        . 12,3456
     .                .                 .           3       21       . 3456
50.0. - - - - - - - .- - - - - - - - .- - - - - - - - -3- - - 21- - - - . 3456
     .                .                 .           3       21       . 3456
     .                .                 .           3       21       . 3456
```

```
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    1     . 12,3456
  60.0. - - - - -.- - - - - -.- - - - -3- - - 1 - - - . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
  70.0. - - - - -.- - - - - -.- - - - -3- - - 21- - - . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
  80.0. - - - - -.- - - - - -.- - - - -3- - - 1 - - - . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
       .         .         .         3    1     . 12,3456
  90.0. - - - - -.- - - - - -.- - - - -3- - - 1 - - - . 12,3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
       .         .         .         3    21    . 3456
 100.0. - - - - -.- - - - - -.- - - - -3- - - 21- - - . 3456
```

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CHANGES FOR RERUN - ATT

ORIGINAL H4	0.000	0.000	0.000	0.000	0.000
PRESENT H4	2.000	2.000	2.000	2.000	2.000

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PAGE  16  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL          ATT

 TIME      JDP     TRNP     NEED  ORDRCE      ATT    WINO  DTMFOR
             2        2        2       2        2   TRINS  TOTFOR
             3        3        3       3        3     CAP  TDDFOR
             4        4        4       4        4  TONEED   DSIZE
             5        5        5       5        5  FORCE . DDSIZE
          HEPR    REDST     FATT  CRATIC   DCRATI     ATU  AHOURS
             2        2     PREC       2        2       2       2
             3        3   TRNGFC       3        3       3       3
             4        4    FOEFC       4        4       4       4
             5        5     TDEL       5        5       5       5
         SCOST    RCOST     TRAV
         PCOST    ACOST
         TCOST   TOTCOST
         UCOST    DCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 E-00     E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-03    E-00     E-00    E-00    E 03
          E-00     E-00     E-00    E-00     E-00    E-00    E-00
          E-00     E-00     E-00    E-00     E-00    E-00    E 03
          E 06     E 0?     E-00
          E 06     E 0?
          E 06     E 0?
          E 06     E 0?
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 0.00   3425.0   357.??    0.000  3425.0    68.50  1540.8  11615.
         640.0    63.?      52.8   640.0    12.80  1.8600  13055.
        4375.0   869.?     452.1  -375.0    37.50  1.0000  15040.
        3000.0   632.?    310.00  3000.0    60.00  1186.9  1203.2
        3600.0   521.??    372.0  3600.0    72.00     0.0  1203.2
            0.     0.??   1203.2      0.       0.  12.000      0.
            0.     0.?     300.8      0.       0.  16.000      0.
        48.000    -.??    211.12  1.2500   1.2500  12.000  210.00
        25.000    -.??    1.0000  3.0000   3.0000  12.000  75000.
        30.000    -.??    7.0000  ?.0000   ?.0000  12.000  103.00
            0.     0.?    1.0000
          0.00     0.0?
            0.       0.
            0.       0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

4.00	3425.0	353.33	0.000	3425.0	205.50	1540.8	11515.
	640.0	63.5	52.8	640.0	38.40	1.3800	13155.
	4375.0	879.0	452.1	4375.0	262.50	1.0000	15040.
	3000.0	552.0	310.00	3000.0	150.00	1186.9	1203.2
	3600.0	520.30	372.0	3600.0	216.00	.0	1203.2
	0.	.00	1203.2	0.	0.	12.000	0.
	0.	.0	300.8	0.	0.	16.000	0.
	48.000	.00	211.12	1.2500	1.2500	12.000	210.00
	25.000	.00	1.0000	3.0000	3.0000	12.000	75000.
	30.000	.00	7.0000	4.0000	4.0000	12.000	108.00
	453.	13.5	1.0000				
	12.33	3.01					
	1325.	2096.					
	283.	1398.					
8.00	2117.2	7.25	0.000	1863.1	108.96	1376.2	13416.
	1319.7	578.94	1198.8	2441.1	57.92	3.0933	17121.
	3948.6	761.5	399.6	4375.0	203.21	1.2041	15279.
	2710.9	612.3	614.00	3000.0	139.51	3461.1	4082.1
	3239.2	449.15	748.8	3600.0	166.70	2039.5	5203.9
	0.	-254.11	2370.4	0.	0.	10.034	0.
	0.	1121.4	963.2	0.	0.	15.000	0.
	53.184	426.44	221.12	1.1282	1.2500	12.000	210.00
	27.665	239.14	.9019	2.7109	3.0000	12.000	75000.
	33.342	360.85	8.4267	3.5991	4.0000	12.000	108.00
	891.	51.0	.9443				
	24.09	10.61					
	2608.	4140.					
	555.	3761.					
12.00	1175.6	.10	0.000	1611.8	59.51	1317.8	13930.
	2292.8	446.73	847.3	2955.1	116.06	2.1467	15078.
	3623.3	731.2	1186.6	4375.0	193.41	1.2461	15542.
	2489.9	577.3	809.31	3000.0	126.03	3826.1	4922.0
	2973.2	449.43	983.0	3600.0	150.50	2990.0	5497.3
	0.	436.25	2517.4	0.	0.	9.803	0.
	0.	662.7	1062.0	0.	0.	16.000	0.
	57.958	751.30	219.13	1.0352	1.2500	12.000	210.00
	30.122	510.11	.8279	2.4899	3.0000	12.000	75000.
	36.324	526.79	8.7227	3.3035	4.0000	12.000	108.00
	1288.	105.0	1.0032				
	34.67	17.20					
	3793.	5155.					
	919.	5334.					

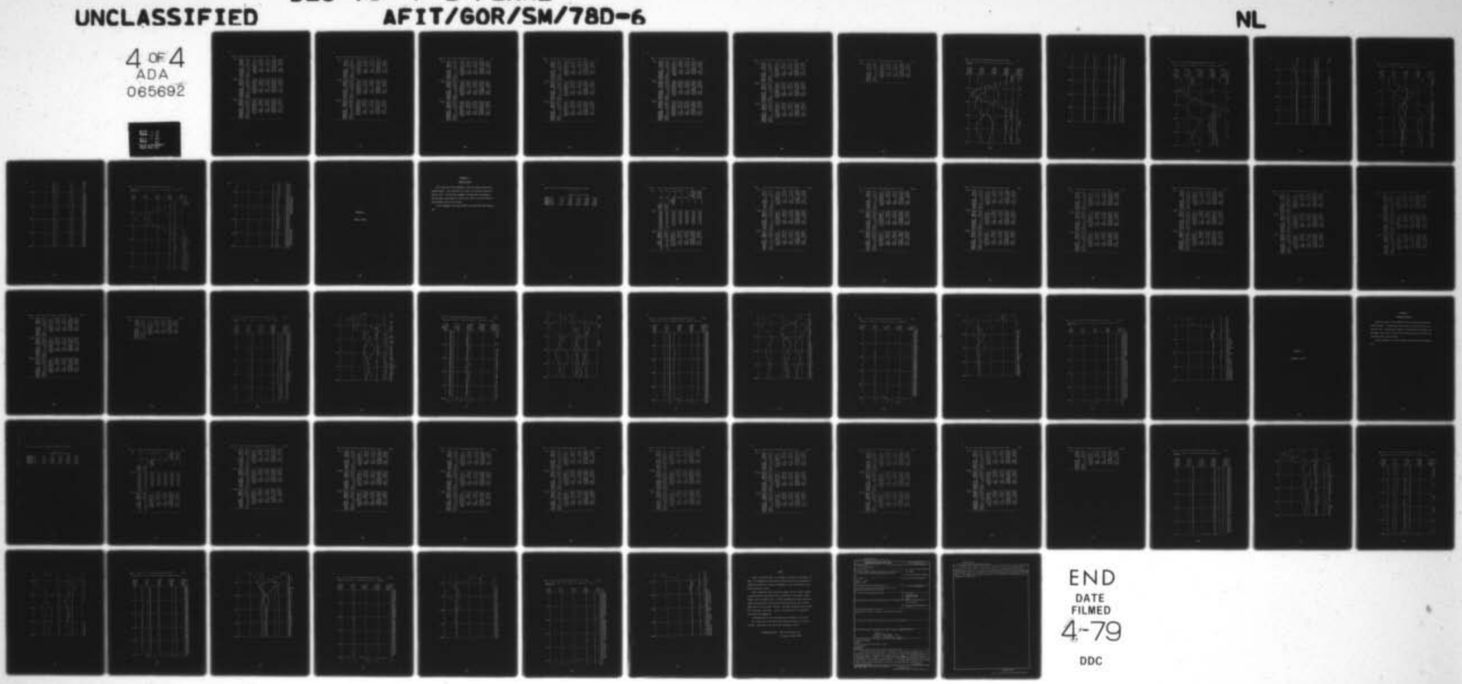
PAGE 18 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL ATT

16.00	750.1	.00	0.000	1555.7	42.08	1524.7	13529.
	2337.8	273.27	412.1	2553.6	127.60	1.3515	15150.
	3596.5	295.3	1209.7	4375.0	132.18	1.2210	15034.
	2459.7	710.7	835.15	3000.0	131.44	3438.7	4421.0
	2975.2	570.77	981.7	3600.0	153.99	1983.7	4527.2
	0.	397.57	2543.5	0.	0.	10.129	0.
	0.	163.3	1015.1	0.	0.	16.000	0.
	53.391	775.75	246.49	1.0275	1.2500	12.000	210.00
	30.432	540.37	.8229	2.4547	3.0000	12.000	75000.
	35.700	124.73	6.5473	3.3058	4.0000	12.000	103.00
	1572.	150.2	1.0827				
	45.90	23.55					
	4944.	3777.					
	1529.	5893.					
20.00	510.4	.00	0.000	1354.5	25.30	1803.3	12935.
	2033.8	173.9	176.5	1950.3	115.75	1.7245	17054.
	3884.7	1151.7	975.9	4375.0	223.00	1.1507	14300.
	2652.3	915.2	675.70	3000.0	152.25	2516.4	3507.4
	3218.5	507.15	765.2	3600.0	154.75	772.0	3427.1
	0.	354.17	2555.1	0.	0.	10.936	0.
	0.	-73.7	860.0	0.	0.	16.000	0.
	54.058	490.25	279.22	1.1059	1.2500	12.000	210.00
	29.278	547.77	.8859	2.5523	3.0000	12.000	75000.
	33.556	381.77	8.0552	3.5751	4.0000	12.000	103.00
	2069.	239.3	1.0860				
	59.17	30.37					
	6255.	10934.					
	2371.	3771.					
24.00	456.4	31.35	43.583	1150.6	27.51	2003.8	12513.
	1621.4	153.37	133.7	1537.6	97.73	1.7571	13234.
	4285.8	1709.1	565.4	4375.0	258.33	1.0849	13653.
	2334.2	1043.2	459.63	3000.0	175.06	1844.2	2543.1
	3534.4	783.25	541.9	3600.0	213.04	-83.5	2773.8
	0.	594.77	2362.3	0.	0.	11.869	0.
	0.	-83.7	712.3	0.	0.	16.000	0.
	48.998	31.15	295.25	1.2245	1.2500	12.000	210.00
	25.550	63.77	.9799	2.0342	3.0000	12.000	75000.
	30.556	67.51	7.5944	3.3272	4.0000	12.000	103.00
	2493.	271.5	1.0350				
	74.49	37.47					
	7301.	13395.					
	3340.	10304.					

AD-A065 692 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH--ETC F/G 5/1
SYSTEMS DYNAMICS MODELING APPROACH TO ANALYSIS OF THE USAF PILO--ETC(U)
DEC 78 P L FEKKE

UNCLASSIFIED AFIT/GOR/SM/78D-6 NL

4 OF 4
ADA
065692



END
DATE
FILMED
4-79
DDC

28.00	1099.4	252.27	0.000	1224.1	63.36	1988.2	12503.
	1478.1	259.67	237.7	1528.4	39.71	1.9672	19537.
	4375.3	1175.7	615.8	4375.0	254.08	1.0908	13727.
	3005.4	935.0	417.56	3000.0	131.40	1795.5	2307.7
	3591.5	715.30	514.1	3600.0	216.77	-111.8	2373.8
	0.	124.71	3055.6	0.	0.	11.949	0.
	0.	51.7	726.9	0.	0.	15.000	0.
	47.936	-.33	232.60	1.2501	1.2500	12.000	210.00
	24.955	-5.47	.9997	3.0054	3.0000	12.000	75000.
	30.071	3.37	7.6354	3.9905	4.0000	12.000	103.00
	2939.	297.0	.9834				
	90.50	45.67					
	9540.	17152.					
	4249.	11935.					
32.00	1033.8	43.50	0.000	1153.3	51.00	1869.9	12730.
	1717.0	353.44	285.6	1305.2	101.32	1.9997	13347.
	4370.2	1190.1	625.4	4375.0	257.37	1.1434	13934.
	2995.4	943.7	430.03	3000.0	176.75	1853.3	3437.6
	3598.5	721.11	512.7	3600.0	212.34	317.2	3514.9
	0.	119.53	3197.6	0.	0.	11.907	0.
	0.	33.1	845.9	0.	0.	16.000	0.
	48.052	4.75	272.28	1.2486	1.2500	12.000	210.00
	25.039	4.51	.9990	2.9954	3.0000	12.000	75000.
	30.013	1.51	8.0035	3.9983	4.0000	12.000	103.00
	3393.	327.5	.9859				
	105.05	53.83					
	11224.	20115.					
	5010.	13353.					
36.00	690.4	17.50	0.000	1129.9	40.76	1822.6	12331.
	1936.5	335.23	242.9	1955.8	113.22	1.3006	15514.
	4378.2	1173.7	618.6	4375.0	255.97	1.1631	14051.
	3002.7	936.4	423.77	3000.0	175.55	1795.2	3560.7
	3601.5	714.32	509.9	3600.0	210.56	483.2	3590.0
	0.	479.57	3200.8	0.	0.	11.989	0.
	0.	13.1	892.5	0.	0.	16.000	0.
	47.954	-3.21	268.86	1.2509	1.2500	12.000	210.00
	24.978	-2.55	1.0007	3.0027	3.0000	12.000	75000.
	29.987	-1.53	8.1765	4.0017	4.0000	12.000	103.00
	3943.	373.7	.9948				
	120.75	51.97					
	12822.	22930.					
	5703.	14564.					

40.00	517.5	[illegible]	0.000	1124.1	36.44	1873.4	12379.
	1929.3	277.12	159.5	1395.2	117.83	1.9343	15555.
	4373.0	1191.7	623.0	4375.0	258.01	1.1539	13934.
	2993.5	935.7	427.26	3000.0	175.32	1752.2	3533.9
	3598.7	715.95	512.4	3600.0	212.32	315.2	3503.2
	0.	306.57	3168.0	0.	0.	12.027	0.
	0.	-34.1	866.0	0.	0.	16.000	0.
	48.022	1.39	272.80	1.2494	1.2500	12.000	210.00
	25.012	1.37	.9996	2.9986	3.0000	12.000	75000.
	30.011	1.27	8.0772	3.9986	4.0000	12.000	103.00
	4239.	413.2	1.0086				
	135.48	59.31					
	14403.	25754.					
	6443.	15562.					
44.00	821.2	165.77	0.000	1124.2	49.14	1939.9	12737.
	1900.0	246.30	168.1	1752.3	107.72	1.8297	19739.
	4370.7	1133.5	627.1	4375.0	251.55	1.1293	13852.
	2996.7	943.7	430.22	3000.0	179.33	1761.1	3293.5
	3596.9	720.41	515.7	3600.0	215.24	49.9	3250.2
	0.	302.05	3210.3	0.	0.	12.025	0.
	0.	-37.7	818.6	0.	0.	16.000	0.
	48.048	4.31	276.95	1.2488	1.2500	12.000	210.00
	25.027	3.27	.9990	2.9967	3.0000	12.000	75000.
	30.025	3.15	7.9054	3.9965	4.0000	12.000	103.00
	4737.	463.1	1.0093				
	150.74	77.[illegible]					
	16027.	28716.					
	7250.	15693.					
48.00	1053.5	186.37	0.000	1113.1	53.44	1987.7	12574.
	1706.4	259.55	206.6	1639.0	102.75	1.3716	13035.
	4371.9	1193.1	626.5	4375.0	263.25	1.1194	13737.
	2997.7	947.7	431.08	3000.0	180.51	1793.2	3193.8
	3597.5	723.37	517.0	3500.0	216.63	-57.7	3190.8
	0.	59.[illegible]	3258.5	0.	0.	12.000	0.
	0.	-7.[illegible]	758.5	0.	0.	16.000	0.
	48.035	3.11	277.71	1.2491	1.2500	12.000	210.00
	25.019	2.29	.9993	2.9977	3.0000	12.000	75000.
	30.020	2.35	7.8357	3.9974	4.0000	12.000	103.00
	5190.	505.[illegible]	1.0032				
	156.40	95.0[illegible]					
	17699.	31720.					
	9073.	17649.					

52.00	1125.1	159.17	0.000	1095.3	57.35	1951.6	12707.
	1714.5	287.75	227.1	1731.6	102.94	1.5046	19377.
	4374.7	1192.3	627.2	4375.0	252.54	1.1266	13302.
	2999.8	947.2	430.06	3000.0	180.10	1800.5	3256.1
	3599.7	523.1	516.2	3600.0	215.11	-11.3	3233.9
	0.	-29.3	3295.2	0.	0.	11.983	0.
	0.	17.0	813.1	0.	0.	16.000	0.
	48.003	.23	275.67	1.2499	1.2500	12.000	210.00
	25.001	.15	.9999	2.9998	3.0000	12.000	75000.
	30.002	.23	7.8962	3.9997	4.0000	12.000	108.00
	5649.	546.3	.9972				
	182.10	94.33					
	19387.	34723.					
	8970.	18513.					
56.00	1065.2	129.37	0.000	1090.3	63.63	1924.2	12755.
	1774.7	239.34	230.1	1790.7	105.02	1.5011	19027.
	4376.2	1131.0	625.6	4375.0	251.42	1.1374	13855.
	3000.9	944.5	428.94	3000.0	179.27	1799.7	3374.0
	3600.9	521.45	515.0	3600.0	215.10	83.7	3337.9
	0.	25.13	3304.2	0.	0.	11.998	0.
	0.	15.9	834.3	0.	0.	16.000	0.
	47.985	-1.24	273.78	1.2504	1.2500	12.000	210.00
	24.992	-.34	1.0003	3.0009	3.0010	12.000	75000.
	29.993	-.85	7.9618	4.0010	4.0000	12.000	108.00
	6105.	589.5	.9962				
	197.60	102.59					
	21060.	37591.					
	9535.	19292.					
60.00	995.0	124.74	0.000	1092.7	59.36	1916.3	12738.
	1811.4	231.29	220.8	1812.9	108.06	1.6810	13955.
	4375.8	1139.4	625.4	4375.0	251.04	1.1407	13381.
	3000.5	943.5	428.93	3000.0	179.00	1799.7	3407.4
	3600.5	520.59	514.7	3600.0	214.79	109.7	3407.0
	0.	97.57	3297.3	0.	0.	12.000	0.
	0.	1.5	840.8	0.	0.	16.000	0.
	47.991	-.78	273.33	1.2502	1.2500	12.000	210.00
	24.995	-.57	1.0002	3.0006	3.0000	12.000	75000.
	29.995	-.53	7.9852	4.0106	4.0000	12.000	108.00
	6561.	533.2	.9993				
	212.35	110.84					
	22713.	40623.					
	10397.	19973.					

64.00	987.9	132.31	0.000	1034.4	53.06	1927.9	12753.
	1802.7	279.17	212.4	1734.5	107.77	1.8686	13356.
	4374.7	1139.1	626.2	-375.0	251.55	1.1368	13354.
	2999.9	944.1	429.42	3000.0	179.34	1783.3	3363.4
	3599.8	721.02	515.2	3600.0	215.22	57.8	3360.1
	0.	106.51	3292.2	0.	0.	12.007	0.
	0.	-3.2	833.2	0.	0.	16.000	0.
	48.004	.72	274.24	1.2493	1.2500	12.000	210.00
	25.002	.27	.9999	2.9398	3.0000	12.000	75000.
	30.002	.21	7.9579	3.9998	4.0000	12.000	103.00
	7015.	675.3	1.0019				
	228.32	119.07					
	24364.	43573.					
	11163.	20533.					
68.00	1030.4	154.37	0.000	1092.8	51.77	1941.7	12743.
	1774.8	274.83	211.7	1767.9	106.38	1.5709	13033.
	4374.2	1170.5	627.0	4375.0	252.20	1.1320	13836.
	2999.4	945.3	429.96	3000.0	179.79	1784.5	3320.3
	3599.4	721.97	515.8	3600.0	215.76	18.3	3314.4
	0.	62.33	3296.1	0.	0.	12.005	0.
	0.	-5.9	823.8	0.	0.	16.000	0.
	48.009	.80	275.12	1.2498	1.2500	12.000	210.00
	25.005	.50	.9998	2.9994	3.0000	12.000	75000.
	30.005	.58	7.9212	3.9994	4.0000	12.000	103.00
	7472.	713.7	1.0019				
	243.80	127.31					
	26025.	46541.					
	11953.	21170.					
72.00	1059.4	157.45	0.000	1089.0	54.15	1945.7	12734.
	1759.4	278.34	216.1	1759.2	105.54	1.8801	13045.
	4374.5	1191.4	627.1	4375.0	252.41	1.1308	13823.
	2999.7	945.0	430.03	3000.0	179.94	1789.2	3307.9
	3599.6	722.35	516.0	3600.0	215.93	4.1	3309.5
	0.	19.61	3304.3	0.	0.	11.999	0.
	0.	-.2	821.4	0.	0.	16.000	0.
	48.005	.47	275.24	1.2499	1.2500	12.000	210.00
	25.003	.34	.9959	2.9397	3.0100	12.000	75000.
	30.003	.33	7.9155	3.9996	4.0000	12.000	103.00
	7928.	762.7	1.0004				
	259.36	175.53					
	27695.	49520.					
	12739.	21683.					

PAGE 33 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL ATT

76.00	1075.5	150.32	0.000	1086.4	64.47	1941.0	12743.
	1754.5	284.37	219.7	1768.3	105.75	1.8854	13051.
	4375.1	1191.1	526.8	4375.0	252.21	1.1327	13330.
	3000.1	945.3	429.77	3000.0	179.81	1792.0	3325.8
	3600.0	722.13	515.8	3600.0	215.76	21.1	3330.6
	0.	10.72	3309.6	0.	0.	11.997	0.
	0.	3.7	825.1	0.	0.	16.000	0.
	47.999	-.05	274.81	1.2500	1.2500	12.000	210.00
	24.999	-.07	1.0000	3.0001	3.0000	12.000	75000.
	30.000	-.04	7.9268	4.0000	4.0000	12.000	103.00
	8385.	805.4	.9992				
	274.91	143.93					
	29367.	52437.					
	13513.	22158.					
80.00	1059.6	144.99	0.000	1086.2	53.44	1935.5	12755.
	1777.0	295.97	219.7	1779.9	105.40	1.9839	13036.
	4375.3	1190.7	626.5	4375.0	251.96	1.1347	13841.
	3000.2	945.3	429.56	3000.0	179.63	1791.3	3347.5
	3600.2	721.93	515.5	3600.0	215.56	40.2	3349.9
	0.	26.50	3309.7	0.	0.	11.998	0.
	0.	2.7	829.2	0.	0.	16.000	0.
	47.997	-.23	274.42	1.2501	1.2500	12.000	210.00
	24.998	-.22	1.0001	3.0002	3.0000	12.000	75000.
	29.999	-.21	7.9432	4.0002	4.0000	12.000	103.00
	8843.	848.4	.9993				
	290.41	152.17					
	31035.	55463.					
	14294.	22531.					
84.00	1045.8	144.71	0.000	1097.2	52.60	1934.5	12758.
	1783.0	293.83	217.7	1782.5	105.74	1.8796	13024.
	4375.1	1190.7	626.5	4375.0	251.91	1.1351	13845.
	3000.1	945.1	429.57	3000.0	179.60	1789.2	3351.3
	3600.1	721.59	515.5	3600.0	215.52	43.3	3350.8
	0.	41.43	3307.5	0.	0.	12.000	0.
	0.	-.2	829.9	0.	0.	16.000	0.
	47.998	-.15	274.39	1.2500	1.2500	12.000	210.00
	24.999	-.13	1.0000	3.0001	3.0000	12.000	75000.
	29.999	-.11	7.9459	4.0101	4.0000	12.000	103.00
	9299.	891.5	1.0000				
	305.89	160.47					
	32700.	59425.					
	15068.	22963.					

88.00	1046.0	143.10	0.000	1037.7	52.65	1937.1	12753.
	1780.0	231.70	216.2	1779.2	105.51	1.6775	13025.
	4374.9	1190.3	626.6	4375.0	262.03	1.1342	13341.
	2999.9	945.2	429.70	3000.0	179.58	1788.1	3341.9
	3599.9	721.80	515.6	3500.0	215.51	33.8	3340.2
	0.	41.70	3306.4	0.	0.	12.002	0.
	0.	-1.8	828.1	0.	0.	16.000	0.
	48.001	.08	274.60	1.2500	1.2500	12.000	210.00
	25.001	.05	1.0000	2.9999	3.0000	12.000	75000.
	30.000	.05	7.9394	3.9999	4.0000	12.000	105.00
	9755.	934.7	1.0004				
	321.37	163.65					
	34364.	51390.					
	15945.	23303.					

- -

92.00	1054.9	130.31	0.000	1037.3	53.21	1939.7	12748.
	1774.3	231.07	216.3	1773.1	105.72	1.8794	13034.
	4374.8	1190.3	626.8	4375.0	262.15	1.1333	13335.
	2999.9	945.4	429.79	3000.0	179.76	1788.6	3332.9
	3599.9	721.90	515.7	3600.0	215.71	24.0	3331.9
	0.	32.44	3307.2	0.	0.	12.001	0.
	0.	-1.2	826.3	0.	0.	16.000	0.
	48.002	.15	274.76	1.2500	1.2500	12.000	210.00
	25.001	.11	1.0000	2.9999	3.0000	12.000	75000.
	30.001	.11	7.9330	3.9999	4.0000	12.000	103.00
	10213.	977.7	1.0003				
	336.88	176.37					
	36031.	54359.					
	16624.	23527.					

- -

96.00	1061.6	130.97	0.000	1036.6	53.62	1940.1	12747.
	1771.9	232.03	217.2	1772.1	105.19	1.8803	13040.
	4374.9	1190.3	626.8	4375.0	262.17	1.1332	13334.
	2999.9	945.5	429.79	3000.0	179.78	1789.5	3331.9
	3599.9	722.04	515.7	3600.0	215.73	23.5	3332.1
	0.	25.02	3308.7	0.	0.	12.000	0.
	0.	.7	826.1	0.	0.	16.000	0.
	48.001	.07	274.76	1.2500	1.2500	12.000	210.00
	25.000	.05	1.0000	2.9999	3.0010	12.000	75000.
	30.000	.05	7.9323	3.9999	4.0000	12.000	103.00
	10569.	1020.7	1.0000				
	352.40	185.21					
	37699.	57330.					
	17403.	23906.					

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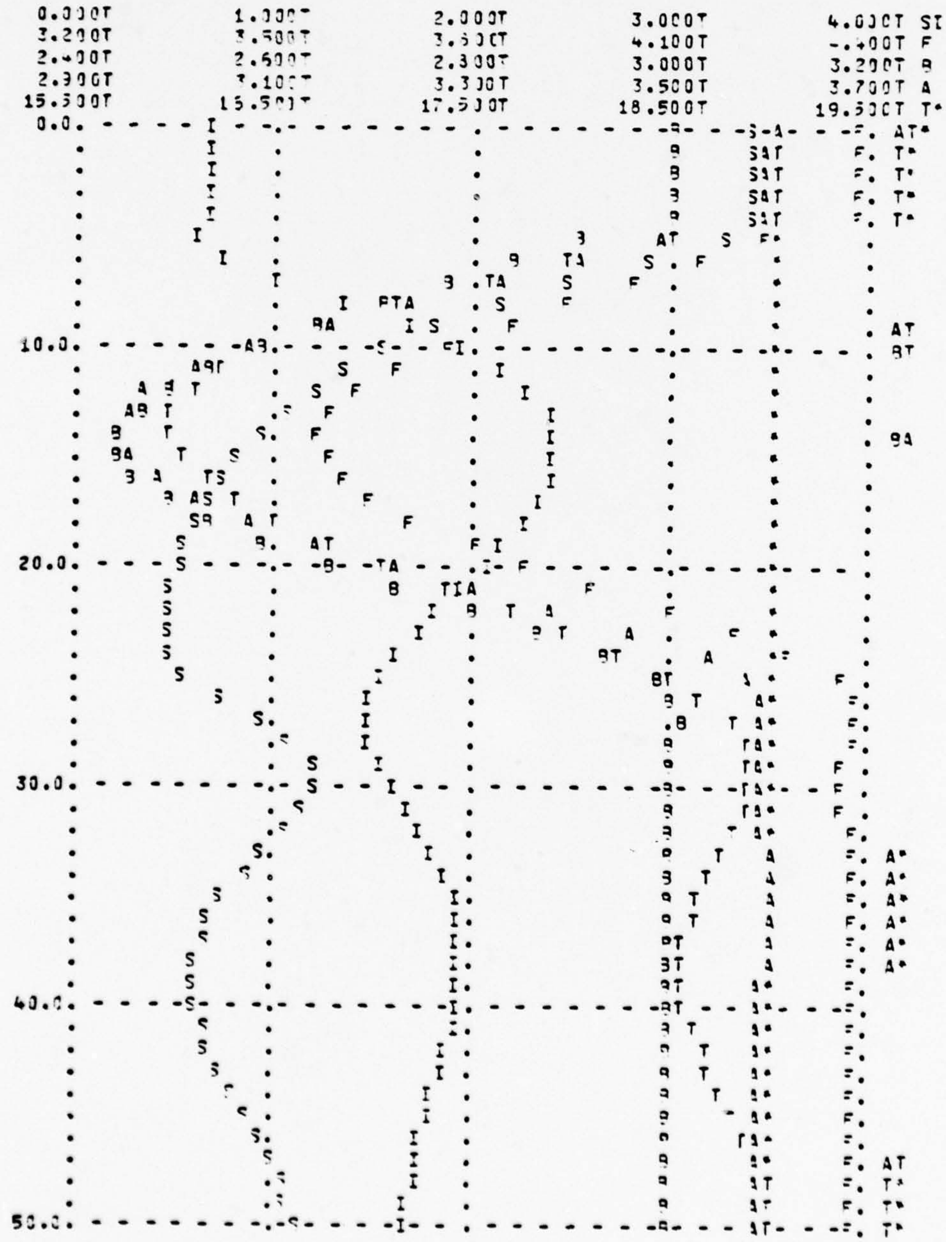
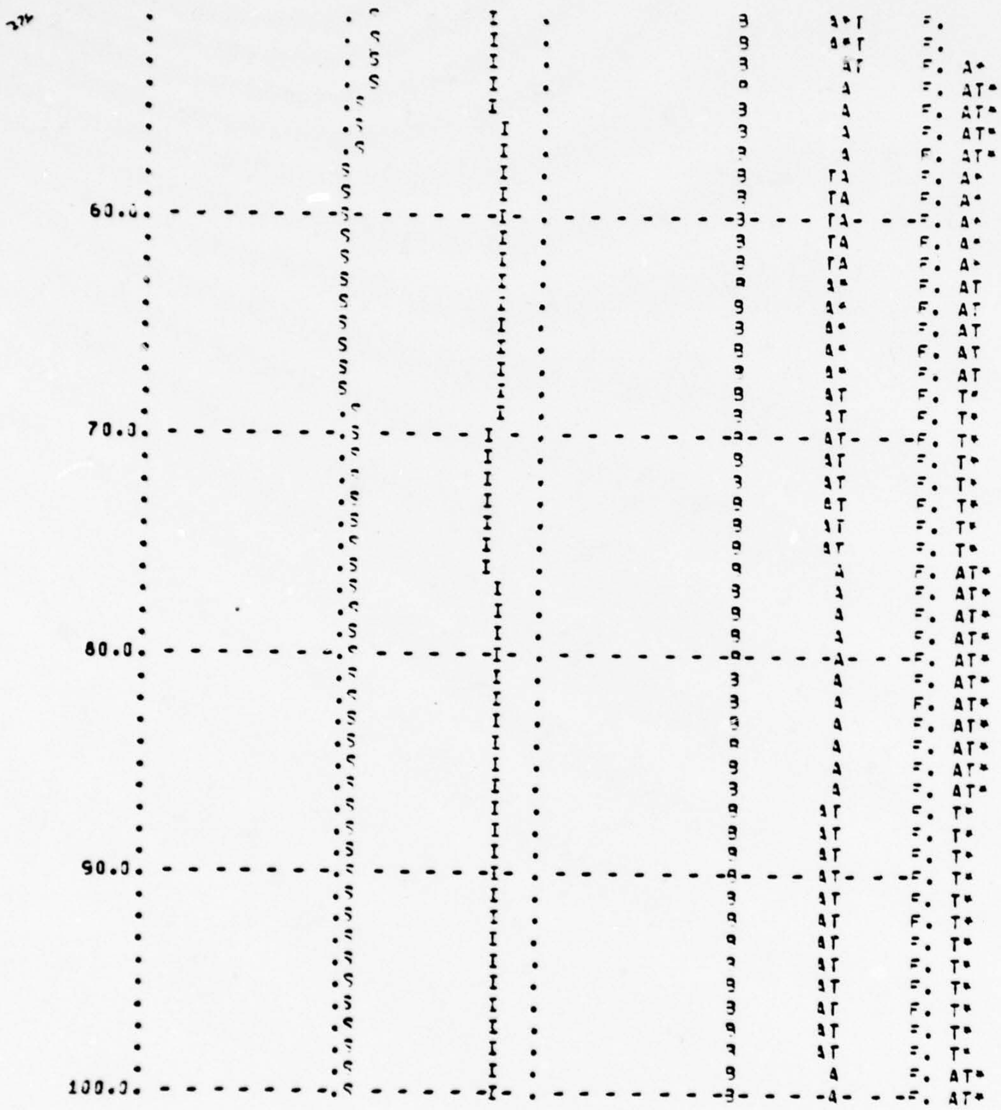
PAGE [illegible] PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL EFF

100.00	1061.3	140.[illegible]	0.000	1056.2	53.60	1938.9	12749.
	1773.5	[illegible]	217.9	1774.3	105.26	1.9311	1900.
	-375.0	1100.[illegible]	626.7	-375.0	252.12	1.1336	13536.
	3000.0	363.[illegible]	429.73	3000.0	170.74	1790.0	3335.2
	3600.0	721.93	515.7	3600.0	215.69	27.0	3337.0
	0.	24.[illegible]	3309.4	0.	0.	11.999	0.
	0.	.[illegible]	827.0	0.	0.	16.000	0.
	48.000	-.[illegible]	274.67	1.2500	1.2500	12.000	210.00
	25.000	-.[illegible]	1.0000	3.0000	3.0000	12.000	75000.
	30.000	-.[illegible]	7.9354	4.0000	4.0000	12.000	108.00
	11125.	1063.[illegible]	.9959				
	367.32	193.[illegible]					
	39367.	[illegible]					
	13131.	24153.					

- -

JOB(1)=S JOB(2)=I JOB(3)=F JOB(4)=B JOB(5)=A TOTFOR=T
FORSIZ=*

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90.0
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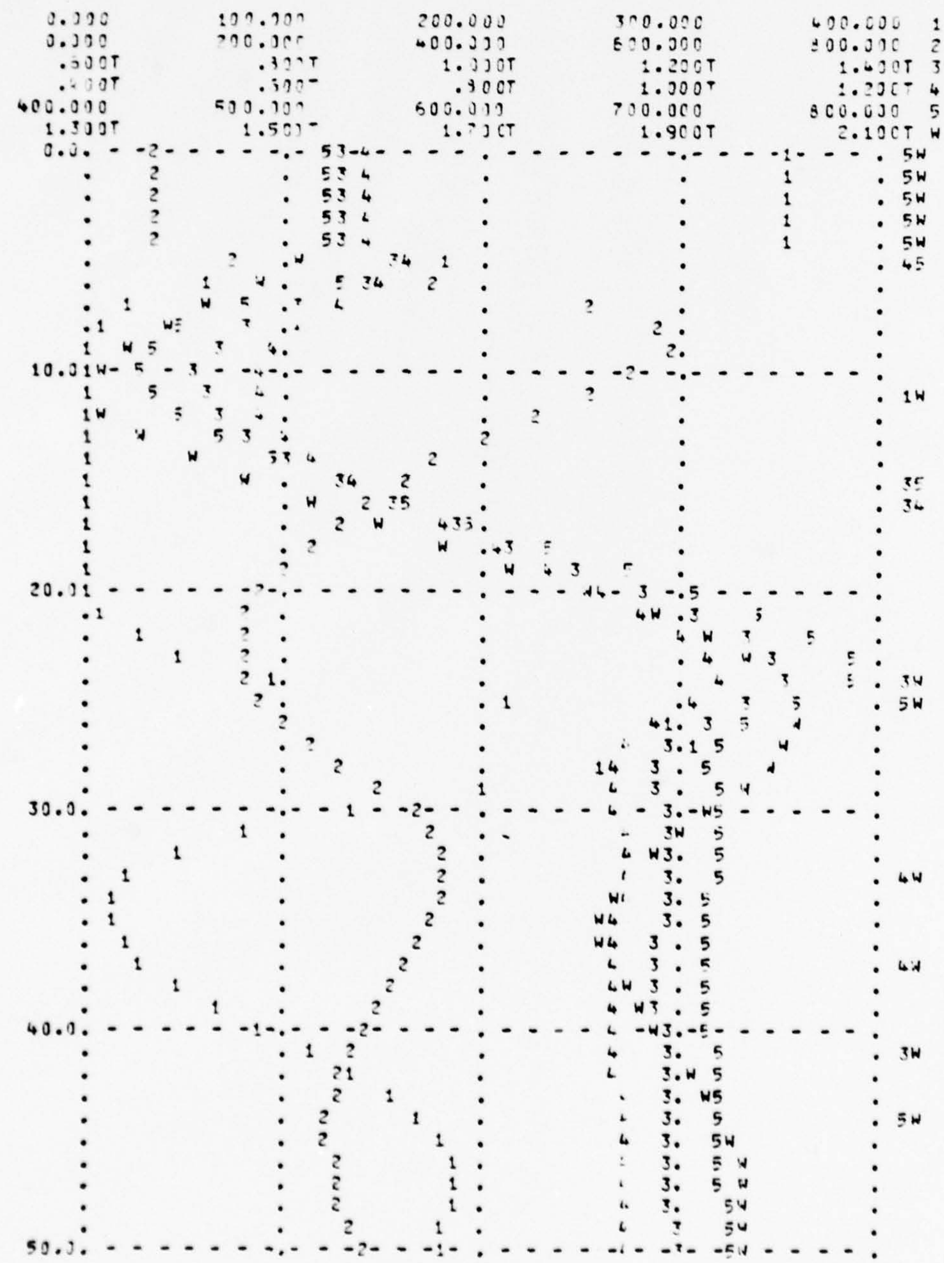
PAGE 27 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL ATT

TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W



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     .               .       2 1      .          4   3.  5W           .
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     .               .      12        .          4   3.  5            . 5W
     .               .     1 2        .          4   3. W5            .
     .               .    1  2        .          4   3. W5            .
     .               .    1  2        .          4   3.W 5            .
     .               .   1   2        .          4   3.W 5            .
     .               .   1   2        .          4   3.W 5            .
 60.0. - - - - - - - .- -1- 2 - - - - . - - - - -4- 3.W 5 - - - - - - .
     .               .    1  2        .          4   3.W 5            .
     .               .     12         .          4   3. W5            .
     .               .     12         .          4   3. W5            .
     .               .      1         .          4   3. W5            . 12
     .               .      21        .          4   3. W5            .
     .               .      21        .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2  1      .          4   3.  5            . 5W
 70.0. - - - - - - - .- - -2- 1 - - - . - - - - -4- 3.- 5 - - - - - - . 5W
     .               .      2  1      .          4   3.  5            . 5W
     .               .      2  1      .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
 80.0. - - - - - - - .- - -21 - - - - . - - - - -4- 3.- 5 - - - - - - . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
 90.0. - - - - - - - .- - -21 - - - - . - - - - -4- 3.- 5 - - - - - - . 5W
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     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      2 1       .          4   3.  5            . 5W
     .               .      21        .          4   3.  5            . 5W
100.0. - - - - - - - .- - -21 - - - - . - - - - -4- 3.- 5 - - - - - - . 5W
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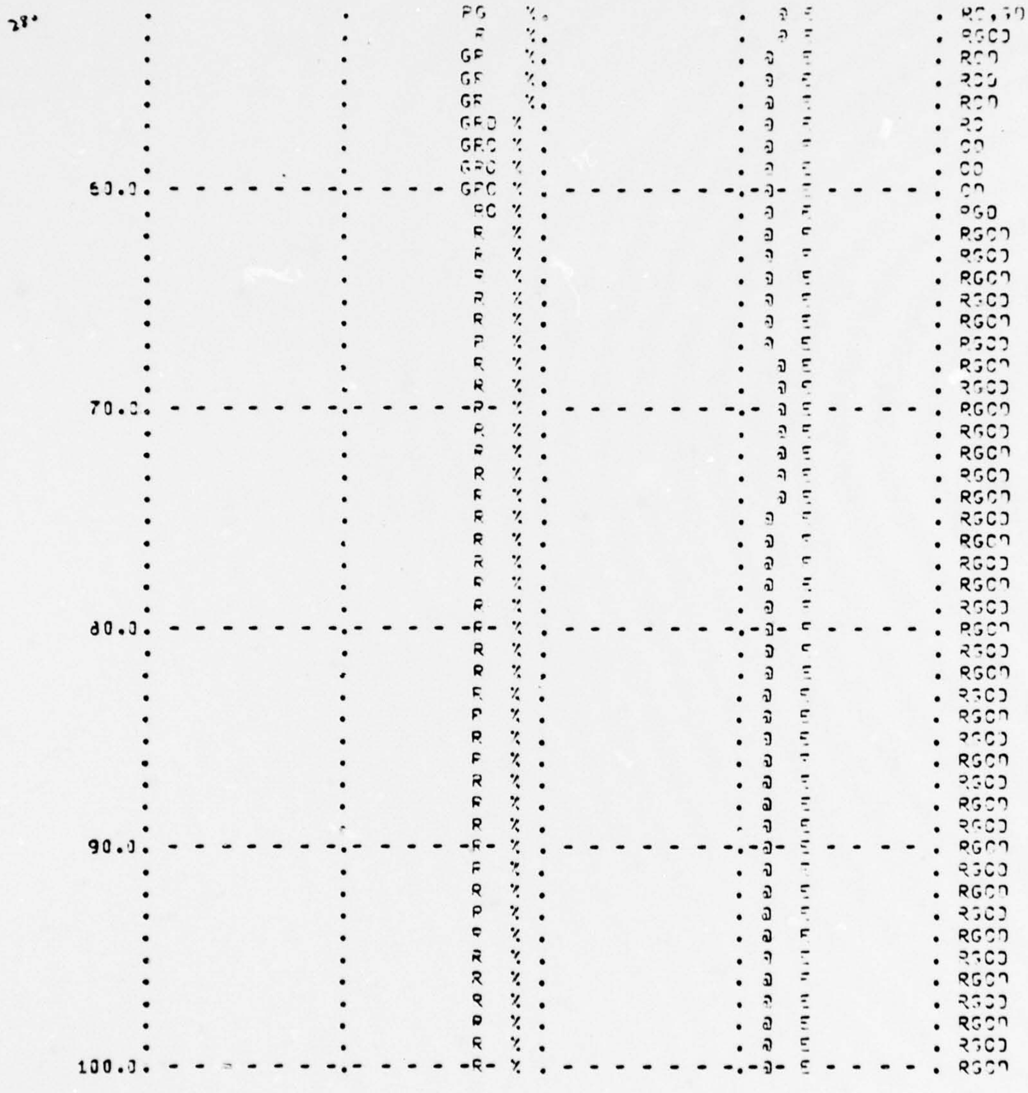
PAGE 28 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

PRED=R UPT=G DRIFT=C DCSIZE=D TRINS=% EORED=E TRNSFD=@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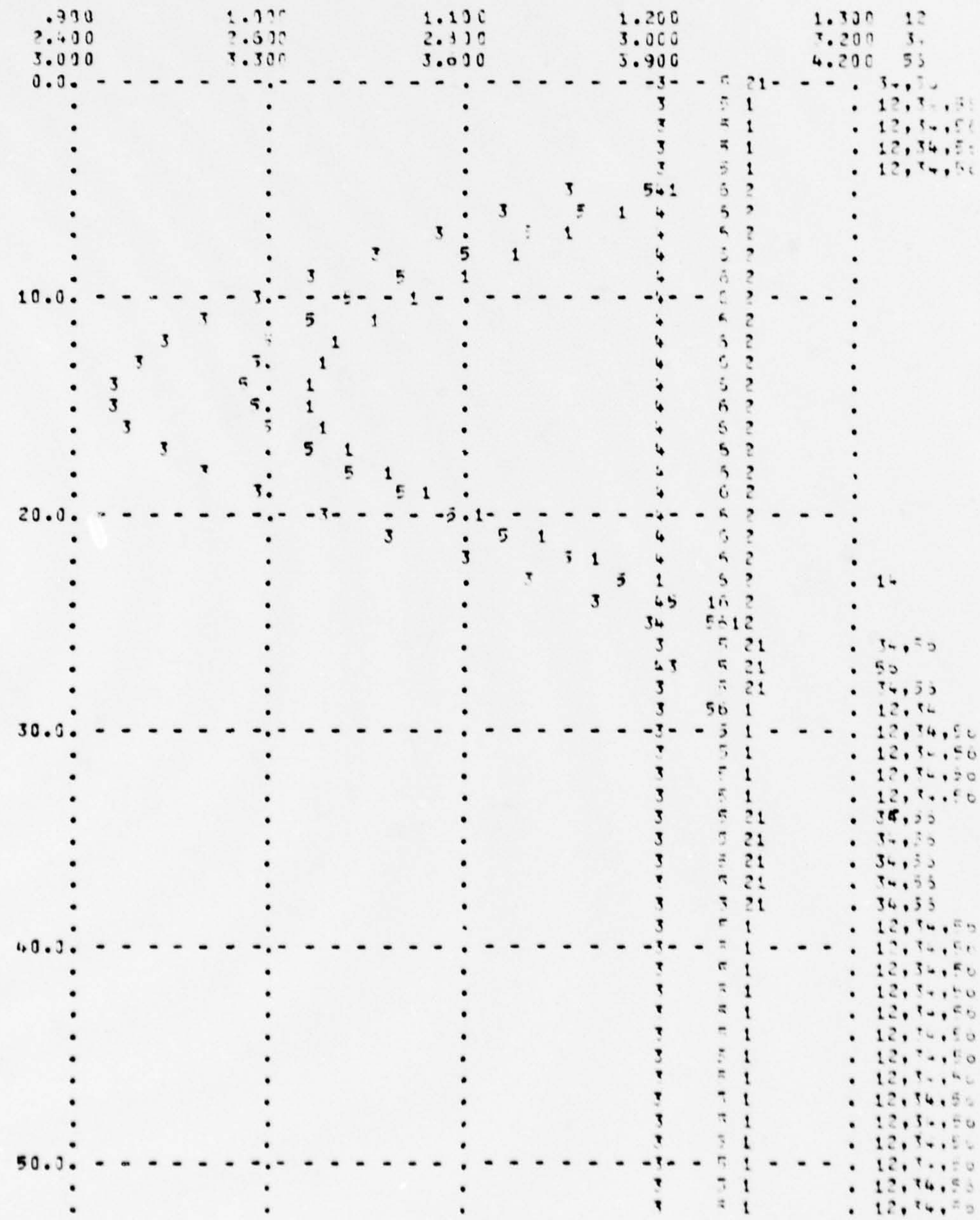
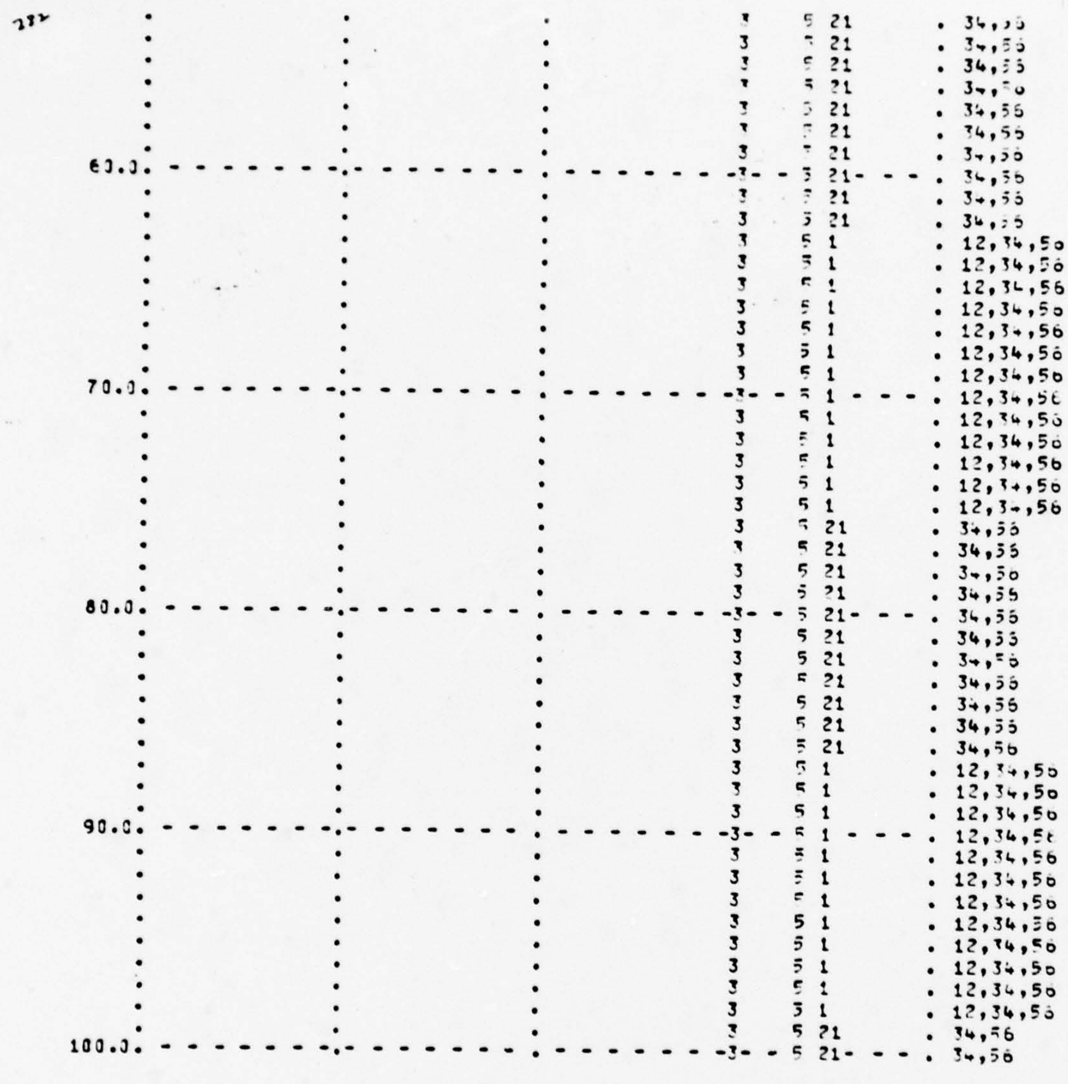
70.0
80.0
90.0
100.0

PAGE 29 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL ATT

CRATIO(3)=1 DCRATI(3)=2 CRATIO(4)=3 DCRATI(4)=4 CRATIO(5)=5 DCRATI(5)=6




60.0
70.0
80.0
90.0
100.0

APPENDIX H

NOISE LISTING

APPENDIX H

Noise Listing

The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

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PAGE 16 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

H -- NOISE

CHANGES FOR [illegible] - NOISE

ORIGINAL N4	0.000	0.000	0.000	0.000	0.000
PRESENT N4	.200	.200	.200	.200	.200
ORIGINAL H4	0.000	0.000	0.000	0.000	0.000
PRESENT H4	1.000	1.000	1.000	1.000	1.000
ORIGINAL TS4	4.000	4.000	4.000	4.000	4.000
PRESENT TS4	48.000	48.000	48.000	48.000	48.000

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PAGE  17  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            NOISE

 TIME        JOB      TRNG       NEED   DFORCE       ATT      WIND  OTHFOR
               2         2          2        2         2     TRINS  TOTFOR
               3         3          3        3         3       CAP  TODFOR
               4         4          4        4         4    TONEED   DSIZE
               5         5          5        5         5     FORCE  DDSIZE
            HEPP    DFOST        PATT   CRATIO    DCRATI       ATJ  AHOURS
               2         2       PREC        2         2         2       2
               3         3     TRNGEC        3         3         3       3
               4         4      FOEFC        4         4         4       4
               5         5       TOEL        5         5         5       5
           SCOST    RCOST        TRAV
           PCOST    ACOST
           TCOST   TOTCOS
           UCOST    OCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  E-00      E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-03     E-00      E-00      E-00     E 03
            E-00     E-00       E-00     E-00      E-00      E-00     E-00
            E-00     E-00       E-00     E-00      E-00      E-00     E 03
            E 05     E 05       E-00
            E 05     E 05
            E 06     E 06
            E 05     E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  0.00    3425.0   353.92         0.    3425.0     59.26    1540.8  11615.
           540.0    58.54      52.80     540.0    12.376    1.8800  13055.
          4375.0   959.0      452.08    4375.0     89.38    1.0000  15340.
          3000.0   592.07     310.00    3000.0     54.19    1185.9  1203.2
          3600.0   520.83     372.00    3600.0     75.56       0.0  1203.2
              0.      0.0     1203.2        0.        0.    12.000      0.
              0.     0.00     300.80        0.        0.    16.000      0.
          48.000     -.00     211.12    1.2500    1.2500    12.000  210.00
          25.000     -.00     1.0000    3.0000    3.0000    12.000  75000.
          30.000     -.00     7.0000    4.0000    4.0000    12.000  108.00
              0.     0.00     1.0000
            0.00     0.00
              0.       0.
              0.       0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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4.00	3413.8	351.7	0.	3419.7	55.50	1540.2	11520.
	644.9	70.[illegible]	53.27	645.1	14.153	1.8428	13050.
	4374.3	861.[illegible]	452.94	4375.0	94.91	1.0000	15040.
	3001.5	591.70	305.63	3000.0	55.70	1185.9	1214.2
	3600.0	520.57	372.04	3600.0	57.52	7.5	1214.0
	0.	5.9	1206.5	0.	0.	12.001	0.
	0.	.22	303.56	0.	0.	15.000	0.
	48.008	.73	211.19	1.2498	1.2510	12.000	210.00
	24.997	-1.50	1.0001	3.0015	3.0000	12.000	75000.
	30.000	.01	7.0000	4.0000	4.0000	12.000	108.00
	457.	15.72	.9997				
	12.32	3.02					
	1325.	2095.					
	293.	1993.					

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8.00	3399.1	347.82	0.	3411.8	70.75	1539.8	11527.
	651.9	72.30	54.23	652.4	12.152	1.8738	13053.
	4375.1	864.3	453.50	4375.0	98.25	1.0000	15039.
	2999.8	579.90	309.79	3000.0	54.31	1188.2	1221.4
	3601.2	521.[illegible]	370.70	3600.0	75.10	11.4	1221.0
	0.	12.7	1209.6	0.	0.	12.001	0.
	0.	.57	305.34	0.	0.	16.000	0.
	47.998	-.11	211.30	1.2500	1.2500	12.000	210.00
	25.002	.20	1.0001	2.9998	3.0000	12.000	75000.
	29.990	-1.27	7.0000	4.0014	4.0000	12.000	108.00
	915.	31.51	1.0000				
	24.64	6.05					
	2643.	4192.					
	565.	3815.					

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12.00	3417.0	356.87	0.	3420.7	71.03	1542.4	11517.
	641.5	65.29	53.79	642.0	13.534	1.8775	13050.
	4376.0	857.3	451.96	4375.0	92.20	1.0000	15039.
	2998.5	593.07	311.46	3000.0	59.75	1189.4	1204.4
	3599.5	519.32	372.24	3600.0	76.79	-1.8	1207.3
	0.	3.7	1209.1	0.	0.	11.999	0.
	0.	.51	301.09	0.	0.	16.000	0.
	47.999	-1.01	211.30	1.2503	1.2500	12.000	210.00
	25.012	1.43	.9959	2.9986	3.0000	12.000	75000.
	30.003	.41	7.0000	3.9995	4.0000	12.000	108.00
	1372.	47.37	1.0006				
	36.97	9.07					
	3974.	5292.					
	852.	5444.					

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16.00	3420.8	374.42	0.	3419.0	59.49	1542.8	11616.
	641.6	67.41	52.31	540.6	13.174	1.8806	13065.
	4373.5	953.1	454.73	4375.0	91.50	1.0000	15035.
	3000.7	589.41	309.38	3000.0	52.39	1190.3	1205.2
	3593.3	522.31	373.86	3500.0	75.77	-3.0	1205.5
	0.	-1.3	1209.5	0.	0.	11.998	0.
	0.	-.83	301.55	0.	0.	16.000	0.
	48.017	1.51	211.41	1.2496	1.2500	12.000	210.00
	24.994	-.71	.9998	3.0007	3.0000	12.000	75000.
	30.014	1.57	7.0000	3.9982	4.0000	12.000	103.00
	1830.	53.03	.9999				
	49.32	12.10					
	5301.	9332.					
	1137.	6927.					

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20.00	3440.1	354.32	0.	3432.5	74.97	1543.4	11606.
	632.8	52.31	50.36	530.6	11.895	1.8768	13077.
	4377.5	375.3	449.65	4375.0	95.51	1.0000	15033.
	3000.5	579.37	309.05	3000.0	54.80	1182.0	1137.7
	3599.3	520.53	372.96	3600.0	55.88	-15.2	1137.8
	0.	-7.5	1203.1	0.	0.	12.005	0.
	0.	-2.21	296.93	0.	0.	16.000	0.
	47.971	-2.52	211.09	1.2507	1.2500	12.000	210.00
	24.995	-.53	1.0002	3.0105	3.0000	12.000	75000.
	30.005	.58	7.0000	3.9992	4.0000	12.000	103.00
	2287.	78.57	.9992				
	51.55	15.93					
	5623.	10493.					
	1421.	3259.					

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24.00	3435.8	351.53	0.	3424.0	70.45	1541.5	11513.
	635.6	70.33	54.47	637.7	12.566	1.8936	13073.
	4375.5	978.3	451.54	4375.0	95.08	1.0000	15037.
	2999.7	595.12	311.15	3000.0	59.25	1190.3	1203.5
	3598.7	520.73	373.17	3600.0	55.19	.3	1205.5
	0.	-11.3	1205.2	0.	0.	11.996	0.
	0.	2.13	300.88	0.	0.	16.000	0.
	47.994	-.51	211.21	1.2501	1.2500	12.000	210.00
	25.010	1.23	.9998	2.9987	3.0000	12.000	75000.
	30.011	1.70	7.0000	3.9986	4.0000	12.000	103.00
	2745.	94.37	1.0001				
	74.00	18.11					
	7955.	12530.					
	1704.	9431.					

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PAGE 20 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

28.00	3425.8	357.03	0.	3426.9	53.52	1539.8	11515.
	642.5	57.31	50.90	640.4	11.384	1.8382	13056.
	4375.0	958.2	452.00	4375.0	31.01	1.0000	15042.
	3000.5	590.54	309.67	3000.0	59.97	1195.2	1213.2
	3599.2	519.93	372.61	3600.0	74.39	6.9	1211.9
	0.	1.1	1204.9	0.	0.	12.002	0.
	0.	-2.07	303.29	0.	0.	16.000	0.
	48.000	-.02	210.99	1.2500	1.2500	12.000	210.00
	24.936	-.47	1.0000	3.0005	3.0000	12.000	75000.
	30.007	.37	7.0000	3.9391	4.0000	12.000	103.00
	3203.	109.73	.9989				
	86.32	21.12					
	9280.	14685.					
	1985.	10677.					
32.00	3420.3	350.32	0.	3421.5	71.17	1540.1	11513.
	642.2	59.17	54.20	543.8	12.073	1.8570	13051.
	4374.2	961.2	453.16	4375.0	83.30	1.0000	15040.
	2998.6	585.23	311.88	3000.0	55.40	1190.2	1211.9
	3600.5	519.23	371.00	3600.0	72.01	7.9	1213.9
	0.	1.3	1205.9	0.	0.	11.997	0.
	0.	1.57	302.97	0.	0.	16.000	0.
	48.009	.92	211.16	1.2498	1.2500	12.000	210.00
	25.011	1.37	.9998	2.9986	3.0000	12.000	75000.
	29.936	-.45	7.0000	4.0005	4.0000	12.000	103.00
	3560.	125.47	1.0006				
	99.54	24.12					
	10604.	15790.					
	2267.	11569.					
36.00	3419.3	357.58	0.	3425.6	73.52	1540.9	11514.
	643.4	66.13	48.94	539.3	13.454	1.8590	13055.
	4379.1	856.3	447.68	4375.0	32.58	1.0000	15040.
	3001.3	582.21	309.39	3000.0	58.01	1181.6	1202.5
	3596.3	521.72	375.57	3600.0	72.08	-4.2	1193.1
	0.	3.3	1202.2	0.	0.	12.006	0.
	0.	-4.17	300.64	0.	0.	16.000	0.
	47.955	-4.19	211.13	1.2512	1.2500	12.000	210.00
	24.999	-1.32	1.0002	3.0013	3.0000	12.000	75000.
	30.031	3.67	7.0000	3.9959	4.0000	12.000	103.00
	4113.	141.13	.9993				
	110.37	27.17					
	11929.	18875.					
	2550.	12465.					

40.00	3437.3	354.[illegible]	0.	3428.5	71.46	1542.2	11511.
	634.2	63.05	53.49	635.6	13.374	1.8701	13072.
	4373.5	873.7	633.06	4375.0	39.74	1.0000	15039.
	3001.0	690.41	306.92	3000.0	50.02	1187.0	1135.9
	3500.3	521.[illegible]	371.56	3500.0	77.52	-12.4	1197.1
	0.	-3.[illegible]	1199.5	0.	0.	11.998	0.
	0.	1.47	296.48	0.	0.	16.000	0.
	48.015	1.4[illegible]	211.09	1.2436	1.2500	12.000	210.00
	24.991	-1.03	1.0000	3.0010	3.0000	12.000	75000.
	29.997	-.30	7.0000	4.0003	4.0000	12.000	103.00
	4575.	135.[illegible]	1.0009				
	123.30	30.17					
	13255.	2097[illegible].					
	2834.	17773.					
44.00	3536.0	359.32	0.	3432.3	58.46	1541.4	11507.
	635.6	67.41	49.21	632.3	11.385	1.8576	13077.
	4376.4	953.[illegible]	450.27	4375.0	92.35	1.0000	15040.
	3001.0	690.41	308.41	3000.0	54.55	1177.9	1137.0
	3602.3	519.1	370.05	3600.0	55.02	-14.1	1132.1
	0.	-3.7	1196.2	0.	0.	12.008	0.
	0.	-3.22	295.75	0.	0.	16.000	0.
	47.994	-1.47	211.02	1.2504	1.2500	12.000	210.00
	24.992	-.99	1.0004	3.0010	3.0000	12.000	75000.
	29.981	-2.27	7.0000	4.0025	4.0100	12.000	103.00
	5033.	172.21	.9995				
	135.53	33.17					
	14551.	23071.					
	3115.	14915.					
48.00	3442.2	346.37	0.	3426.4	132.74	1540.2	11515.
	631.5	72.33	59.51	639.9	24.353	1.9942	13059.
	4375.7	853.1	450.93	4375.0	174.97	1.0000	15041.
	2997.9	591.62	311.48	3000.0	113.32	1195.7	1135.3
	3597.9	523.65	374.40	3600.0	148.52	4.0	1205.4
	0.	-13.3	1201.4	0.	0.	11.968	0.
	0.	9.37	299.09	0.	0.	16.000	0.
	47.932	-.77	211.02	1.2502	1.2500	12.000	210.00
	25.019	2.15	.9997	2.9979	3.0000	12.000	75000.
	30.019	2.2[illegible]	7.0000	3.9975	4.0000	12.000	103.00
	5491.	187.53	1.0010				
	147.96	35.17					
	13905.	25153.					
	3397.	14673.					

PAGE 22 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

52.00	2435.4	9.21	0.	2561.7	35.58	1439.8	12558.
	1129.9	437.91	535.16	1593.0	-3.337	2.5577	13046.
	4197.4	953.3	649.15	4375.0	147.66	1.0390	15120.
	2979.7	595.10	443.32	3000.0	137.21	2157.9	2899.9
	3457.9	512.51	530.25	3600.0	127.17	1506.3	3333.8
	0.	115.3	1932.4	0.	0.	11.138	0.
	0.	463.10	722.47	0.	0.	16.000	0.
	50.031	177.57	218.64	1.1392	1.2500	12.000	210.00
	26.044	120.27	.9599	2.3797	3.0000	12.000	75000.
	31.233	142.10	7.6229	3.5421	4.0000	12.000	103.00
	5935.	214.58	.9735				
	159.97	41.50					
	17194.	27224.					
	3679.	15270.					
55.00	1575.5	.17	0.	2372.9	50.43	1425.7	12839.
	1775.0	281.35	237.98	1952.7	57.130	1.9121	17430.
	4094.5	694.9	745.40	4375.0	157.40	1.1394	15211.
	2807.9	704.72	510.79	3000.0	105.10	2103.4	3394.0
	3372.5	547.21	609.27	3500.0	120.52	1479.0	3433.4
	0.	797.3	1954.4	0.	0.	11.264	0.
	0.	87.77	838.20	0.	0.	16.000	0.
	51.298	290.47	220.51	1.1699	1.2500	12.000	210.00
	25.710	192.93	.9362	2.3079	3.0000	12.000	75000.
	32.023	227.41	7.9758	3.7473	4.0000	12.000	108.00
	6361.	256.31	1.0190				
	171.25	46.59					
	18425.	29230.					
	4013.	15804.					
60.00	1107.5	.03	0.	2227.7	40.82	1638.2	12472.
	1635.1	95.37	32.35	1495.9	51.596	1.6533	17740.
	4236.4	1095.5	631.24	4375.0	158.59	1.0703	14730.
	2896.9	365.21	439.45	3010.0	111.39	1611.3	2733.3
	3498.7	670.55	508.28	3600.0	139.33	558.0	2555.8
	0.	1120.3	1998.6	0.	0.	11.303	0.
	0.	-138.22	675.63	0.	0.	16.000	0.
	49.571	138.57	246.06	1.2104	1.2500	12.000	210.00
	25.989	103.07	.9698	2.3969	3.0000	12.000	75000.
	30.858	101.25	7.4923	3.3875	4.0000	12.000	105.00
	6782.	297.17	1.0806				
	183.39	51.74					
	19663.	31524.					
	4547.	15331.					

64.00	1552.0	472.85	0.	2246.4	53.87	1849.0	12018.
	1148.3	23.63	30.46	1042.5	-4.388	1.6587	13503.
	4384.5	1025.3	523.88	4375.0	171.39	1.0000	14254.
	3013.8	316.30	351.61	3000.0	123.11	1339.6	1304.7
	3603.3	513.57	433.40	3600.0	141.36	-292.8	1322.8
	0.	394.4	2105.6	0.	0.	12.132	0.
	0.	-105.73	476.17	0.	0.	16.000	0.
	47.897	-9.47	256.08	1.2527	1.2500	12.000	210.00
	24.986	-13.80	1.0024	3.0138	3.0000	12.000	75000.
	29.973	-3.22	7.0000	4.0037	4.0000	12.000	103.00
	7217.	327.13	1.0068				
	197.43	57.17					
	21115.	34157.					
	5253.	15992.					
69.00	2431.6	359.31	0.	2279.5	97.36	1835.8	11970.
	947.5	164.77	149.74	935.0	39.159	2.0016	13139.
	4351.4	1033.5	550.94	4375.0	174.52	1.0000	14250.
	2992.8	313.79	374.55	3000.0	119.88	1526.3	1395.8
	3590.2	627.83	451.08	3600.0	143.48	-274.1	1359.7
	0.	-152.0	2233.8	0.	0.	11.922	0.
	0.	47.37	474.19	0.	0.	16.000	0.
	48.150	13.61	251.61	1.2461	1.2500	12.000	210.00
	25.050	7.13	.9972	2.9928	3.0000	12.000	75000.
	30.091	9.75	7.0000	3.9892	4.0000	12.000	103.00
	7572.	350.97	1.0004				
	212.28	52.37					
	22706.	35925.					
	5923.	17423.					
72.00	2309.6	216.14	0.	2206.0	87.80	1727.4	12212.
	1157.5	235.02	190.23	1237.3	47.313	2.0503	13038.
	4374.9	1029.0	540.89	4375.0	172.93	1.0373	14418.
	2998.6	316.53	371.22	3000.0	114.73	1546.3	2373.3
	3600.5	622.77	443.94	3600.0	144.51	159.8	2452.1
	0.	-103.5	2292.2	0.	0.	11.921	0.
	0.	79.70	593.33	0.	0.	16.000	0.
	48.001	.11	243.44	1.2500	1.2500	12.000	210.00
	25.012	1.41	.9999	2.9986	3.0000	12.000	75000.
	29.936	-.45	7.2613	4.0005	4.0000	12.000	103.00
	8131.	378.17	.9825				
	225.57	68.51					
	24257.	39522.					
	6460.	17875.					

PAGE [illegible] PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

76.00	1982.7	172.3	0.	2139.4	31.62	1672.4	12358.
	1372.4	212.1	143.58	1333.3	55.144	1.8973	18847.
	4377.0	1022.[illegible]	537.97	4375.0	175.21	1.0604	14553.
	3003.5	310.5	366.13	3000.0	123.76	1437.2	2503.7
	3603.7	517.2	439.25	3600.0	140.45	321.2	2503.3
	0.	215.[illegible]	2282.2	0.	0.	11.998	0.
	0.	10.[illegible]	650.93	0.	0.	16.000	0.
	47.979	-2.0[illegible]	239.16	1.2506	1.2500	12.000	210.00
	24.971	-3.4[illegible]	1.0008	3.0035	3.0000	12.000	75000.
	29.959	-3.7[illegible]	7.4226	4.0042	4.0000	12.000	108.00
	8585.	410.[illegible]	.9930				
	240.10	74.[illegible]					
	25732.	41937.					
	6933.	18253.					
80.00	1943.1	255.2[illegible]	0.	2229.4	75.92	1720.5	12274.
	1345.2	140.3[illegible]	93.16	1239.1	55.937	1.8018	18525.
	4375.5	1215.3	537.14	4375.0	174.58	1.0424	14504.
	2999.3	310.1[illegible]	369.62	3000.0	114.73	1441.9	2423.8
	3601.1	618.3[illegible]	441.33	3600.0	135.54	113.1	2377.3
	0.	283.3	2264.2	0.	0.	12.046	0.
	0.	-46.11	605.96	0.	0.	16.000	0.
	47.993	-.50	242.30	1.2502	1.2500	12.000	210.00
	25.006	.7[illegible]	1.0001	2.9993	3.0000	12.000	75000.
	29.981	-1.11	7.2967	4.0012	4.0000	12.000	108.00
	9033.	447.3[illegible]	1.0081				
	253.52	79.9[illegible]					
	27183.	44450.					
	7462.	13617.					
84.00	2159.3	316.5[illegible]	0.	2233.7	57.85	1780.6	12148.
	1202.0	124.5[illegible]	99.40	1173.0	43.713	1.9265	13010.
	4369.7	1027.[illegible]	544.76	4375.0	182.84	1.0195	14332.
	2998.2	312.47	370.74	3000.0	125.01	1458.9	2135.3
	3598.7	570.3[illegible]	444.04	3600.0	139.68	-105.7	2172.0
	0.	7.4[illegible]	2279.7	0.	0.	12.019	0.
	0.	-28.3[illegible]	548.53	0.	0.	16.000	0.
	43.059	6.37	246.76	1.2482	1.2500	12.000	210.00
	25.015	1.30	.9991	2.9982	3.0110	12.000	75000.
	30.011	1.3[illegible]	7.1367	3.9985	4.0110	12.000	108.00
	9492.	477.9[illegible]	1.0068				
	257.54	95.5[illegible]					
	28675.	47975.					
	8041.	19045.					

190

90.00	2312.4	307.23	0.	2220.5	91.21	1753.3	12130.
	1144.4	155.52	130.16	1155.5	47.339	1.9050	13143.
	4375.6	1027.2	539.14	4375.0	170.41	1.0180	14351.
	2999.4	317.93	370.60	3000.0	125.31	1485.7	2130.1
	3597.3	622.37	446.37	3500.0	151.40	-107.0	2135.3
	0.	-92.0	2302.3	0.	0.	11.986	0.
	0.	11.07	545.03	0.	0.	16.000	0.
	47.994	-.59	246.26	1.2502	1.2500	12.000	210.00
	25.005	.55	.9998	2.9994	3.0000	12.000	75000.
	30.023	2.71	7.1261	3.9970	4.0000	12.000	103.00
	9950.	502.05	.9992				
	281.34	91.47					
	30205.	49647.					
	8617.	19254.					
92.00	2295.5	269.47	0.	2217.6	95.41	1750.7	12131.
	1193.7	178.23	142.27	1215.8	47.529	1.9318	13118.
	4371.9	1024.5	542.82	4375.0	175.62	1.0306	14408.
	3000.0	313.39	370.37	3000.0	117.16	1500.1	2305.0
	3599.8	619.92	443.98	3500.0	149.45	18.8	2730.5
	0.	-77.0	2311.7	0.	0.	11.975	0.
	0.	22.17	576.50	0.	0.	16.000	0.
	48.034	3.10	243.56	1.2491	1.2500	12.000	210.00
	25.000	.01	.9997	3.0000	3.0000	12.000	75000.
	30.001	.17	7.2142	3.9998	4.0000	12.000	103.00
	10409.	531.02	.9967				
	296.08	97.23					
	31732.	52221.					
	9155.	19525.					
95.00	2173.7	243.57	0.	2209.5	37.02	1729.6	12244.
	1264.1	180.02	131.47	1258.6	50.558	1.8845	13031.
	4376.1	1025.2	538.55	4375.0	175.32	1.0382	14453.
	3002.1	313.74	367.83	3000.0	121.89	1478.9	2392.2
	3602.9	519.99	441.02	3500.0	137.30	80.1	2392.1
	0.	35.3	2302.1	0.	0.	12.002	0.
	0.	4.42	595.55	0.	0.	16.000	0.
	47.988	-1.05	242.35	1.2503	1.2500	12.000	210.00
	24.992	-2.17	1.0006	3.0021	3.0000	12.000	75000.
	29.976	-2.85	7.2675	4.0032	4.0000	12.000	103.00
	10867.	561.63	.9972				
	309.38	103.01					
	33233.	54750.					
	9673.	19767.					

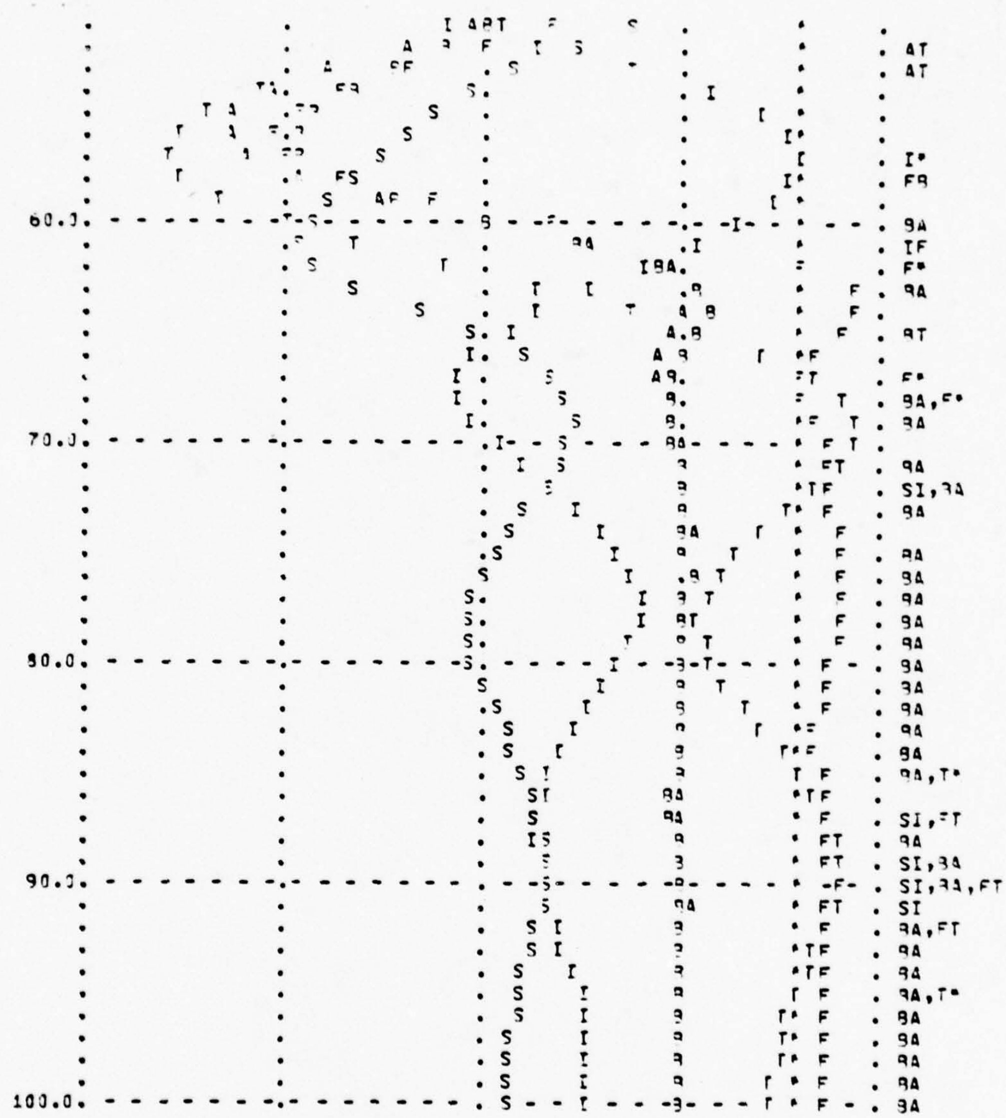
100.00	2138.0	254.93	0.	2210.5	91.36	1779.4	12234.
	1253.4	153.47	124.61	1259.2	50.367	1.8691	13995.
	4374.5	1025.[illegible]	539.92	4375.0	175.55	1.0361	14445.
	2393.3	914.33	371.16	3000.0	120.49	1490.0	2351.4
	3599.5	622.23	444.15	3600.0	143.73	53.6	2357.2
	0.	72.5	2303.6	0.	0.	12.002	0.
	0.	-4.29	590.35	0.	0.	16.000	0.
	49.035	.52	243.25	1.2499	1.2500	12.000	210.00
	25.010	1.20	.9998	2.9988	3.0000	12.000	75000.
	30.024	.57	7.2530	3.9994	4.0000	12.000	103.00
	11323.	592.55	1.0025				
	323.55	103.77					
	34723.	37273.					
	10203.	19935.					

- -

```
PAGE  37  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            NOISE

 JOB(1)=S   JOB(2)=I   JOB(3)=F   JOB(4)=B   JOB(5)=A   TOTFOR=T
 FORSIZ=*

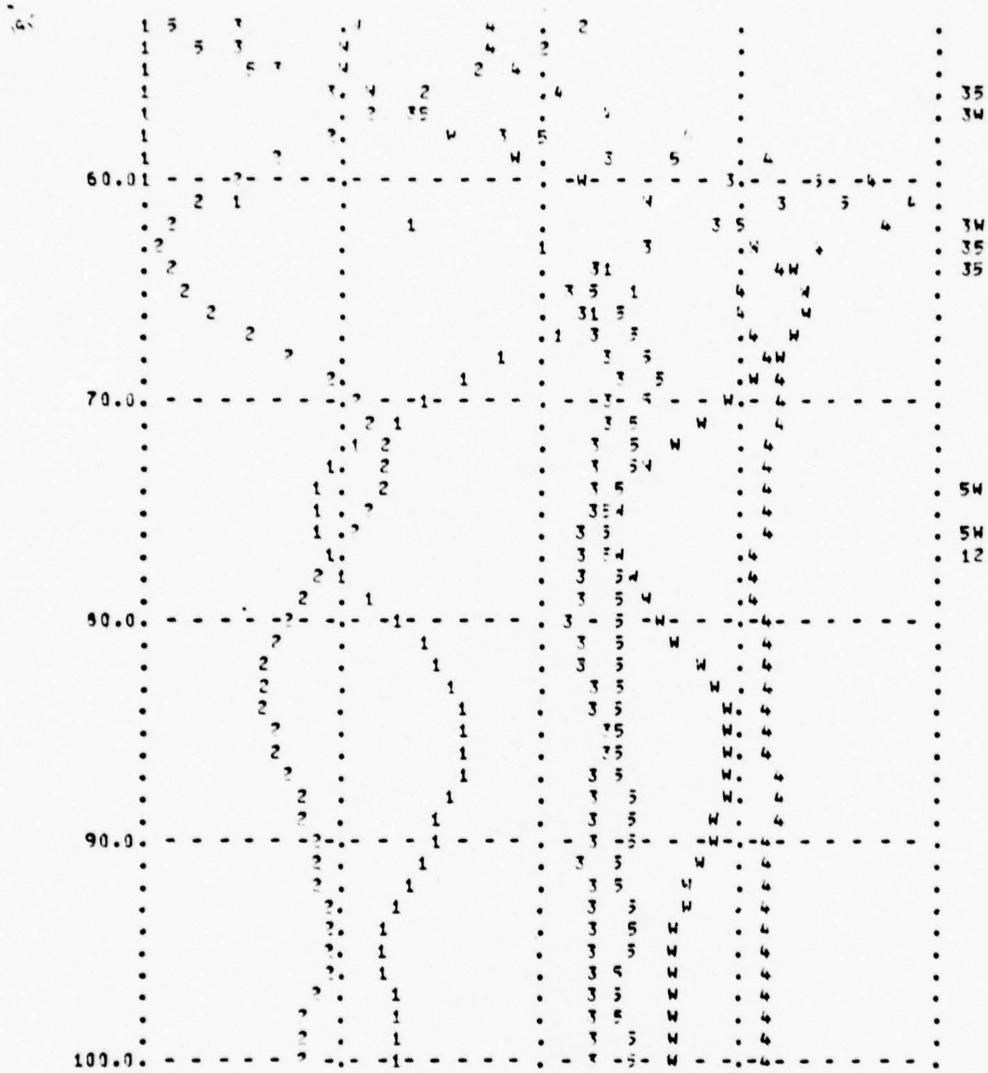
   0.000T            1.000T            2.000T            3.000T            4.000T S
   0.000T             .500T            1.000T            1.500T            2.000T I
   4.000T            4.100T            4.200T            4.300T            4.400T F
   2.700T            2.800T            2.900T            3.000T            3.100T B
   3.300T            3.400T            3.500T            3.600T            3.700T A
  17.250T           17.750T           18.250T           18.750T           19.250T T*
   0.0. - - - - - - - -.- -I- - - - - . - - - - - - - - -B- - -S- T F - . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .    I           .                 B      S  T F   . BA,T*
      .               .    I           .                 B      S  T  F  . BA,T*
  10.0. - - - - - - - -.- -I- - - - - . - - - - - - - - -B- - -S- T -F- . BA,T*
      .               .   I            .                 B      S  T  F  . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S *TF    . BA
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S *TF    . BA
      .               .   I            .                 B      S *T F   . BA
      .               .   I            .                 B      S *T F   . BA
  20.0. - - - - - - - -.- -I- - - - - . - - - - - - - - -B- - - S *T -F- . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B      S  *TF   . BA
      .               .   I            .                 B      S  *TF   . BA
      .               .   I            .                 B      S  *TF   . BA
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
  30.0. - - - - - - - -.- -I- - - - - . - - - - - - - - -B- - -S- T F - . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                 B      S  T F   . BA,T*
      .               .   I            .                AB      S  T  F  . T*
      .               .   I            .                 B      S  *TF   . BA
      .               .   I            .                 B      S  *TF   . BA
      .               .   I            .                 B       S *TF   . BA
  40.0. - - - - - - - -.- -I- - - - - . - - - - - - - - -B- - - S *TF - . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .                 B       S *TF   . BA
      .               .   I            .      AB        FT    S    *     .
  50.0. - - - - - - - -.- - -I- - - - . AB- - T F - -.S - - - * - - .
```


60.0
70.0
80.0
90.0
100.0

```
PAGE  28  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL            NOISE

  TRNG(1)=1  TRNG(2)=2  TRNG(3)=3  TRNG(4)=4  TRNG(5)=5  W(N)=W

  0.000          200.000          400.000          600.000          800.000  12
   .800T            .900T           1.000T           1.100T           1.200T 3
500.000          600.000          700.000          800.000          900.000  4
500.000          550.000          600.000          650.000          700.000  5
  1.200T           1.400T           1.600T           1.800T           2.000T W
  0.0. - -25 -3- - -.- - - - - W1- . - - - - - - -.- - - - - - - . 14
     .    25  3     .          14  .               .               . 1W
     .    25  3     .          14  .               .               . 1W
     .    25  3     .          14  .               .               . 1W
     .    25  3     .          14  .               .               . 1W
     .    25  3     .         W14  .               .               .
     .    25   3    .         W14  .               .               .
     .    2 5  3    .         W14  .               .               .
     .    25   3    .         W14  .               .               .
     .    25  3     .          14  .               .               . 1W
 10.0. - -25 -3- - -.- - - - - W1- . - - - - - - -.- - - - - - - . 14
     .    25  3     .          W14 .               .               .
     .    25  3     .          W14 .               .               .
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          14  .               .               . 1W
     .    25  3     .          W1  .               .               . 14
     .    2 5 3     .          W1  .               .               . 14
     .    2 5 3     .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
     .    25 3      .          W1  .               .               . 14
 20.0. - -25 3 - - -.- - - - - W1- . - - - - - - -.- - - - - - - . 14
     .    25  3     .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          14  .               .               . 1W
     .    25  3     .         W 1  .               .               . 14
     .    25  3     .         W 1  .               .               . 14
     .    25  3     .         W 1  .               .               . 14
 30.0. - -25 -3- - -.- - - - -W14- . - - - - - - -.- - - - - - - .
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          1 4 .               .               . 1W
     .    25  3     .          W14 .               .               .
     .    2 53      .          W1  .               .               . 14
     .    2 53      .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
 40.0. - -25 -3- - -.- - - - - W1- . - - - - - - -.- - - - - - - . 14
     .    2 5 3     .          W1  .               .               . 14
     .    2 5 3     .          W1  .               .               . 14
     .    2 5 3     .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
     .    25  3     .          W1  .               .               . 14
     .    2 5 3     .          W1  .               .               . 14
     .    2 5 3     .          14  .               .               . 1W
     .        2   35 1        W    .4              .               .
 50.0. - - 1 - - - -.-3-2- -W- - - . -4- - - - - - -.- - - - - - - . 35
     . 1       5  3 .    W      2  .4              .               .
     .1  5        3 .  W        4  .  2            .               .
```


60.0
70.0
80.0
90.0
100.0
35
3W
3W
35
35
5W
5W
12

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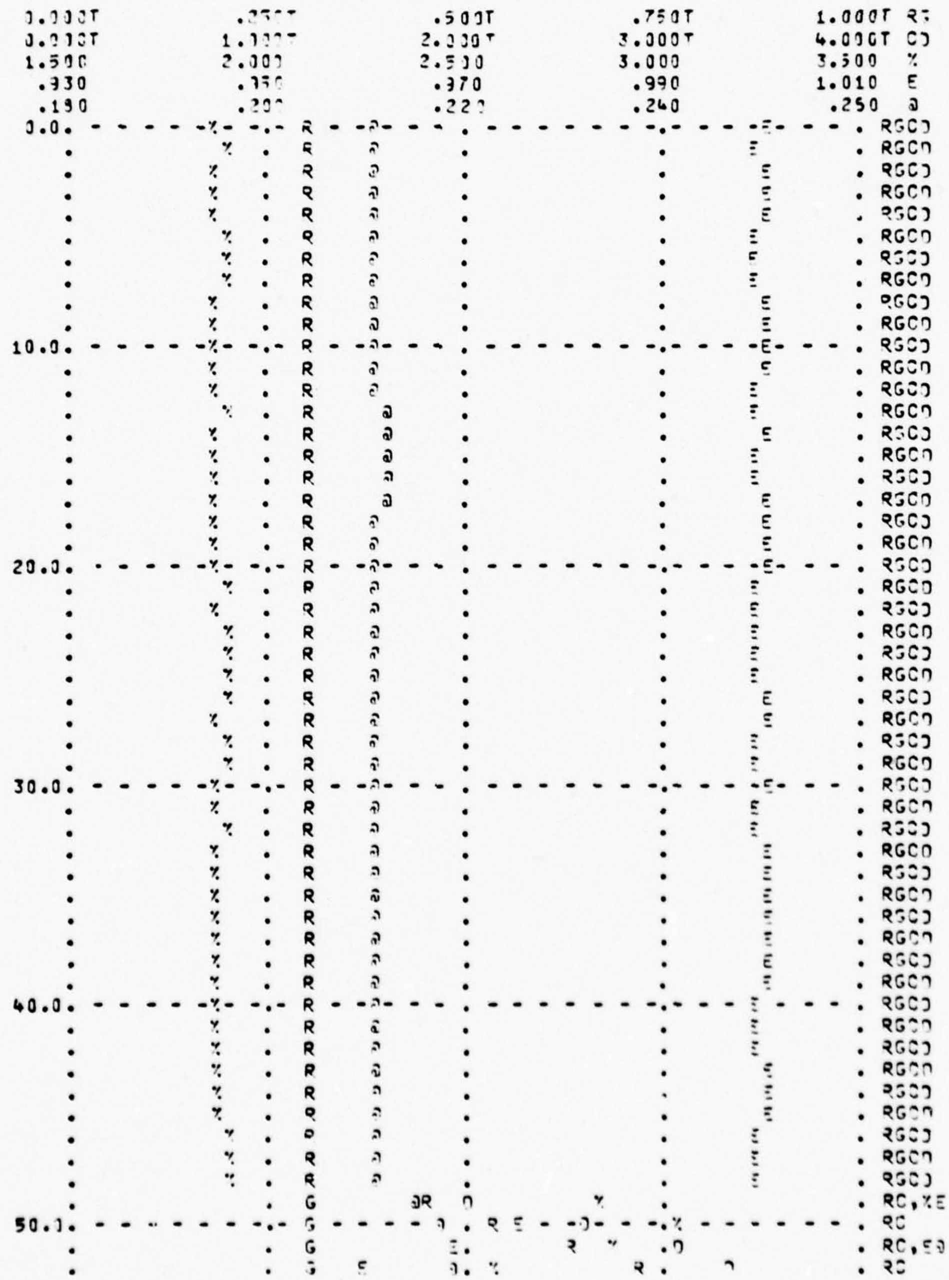
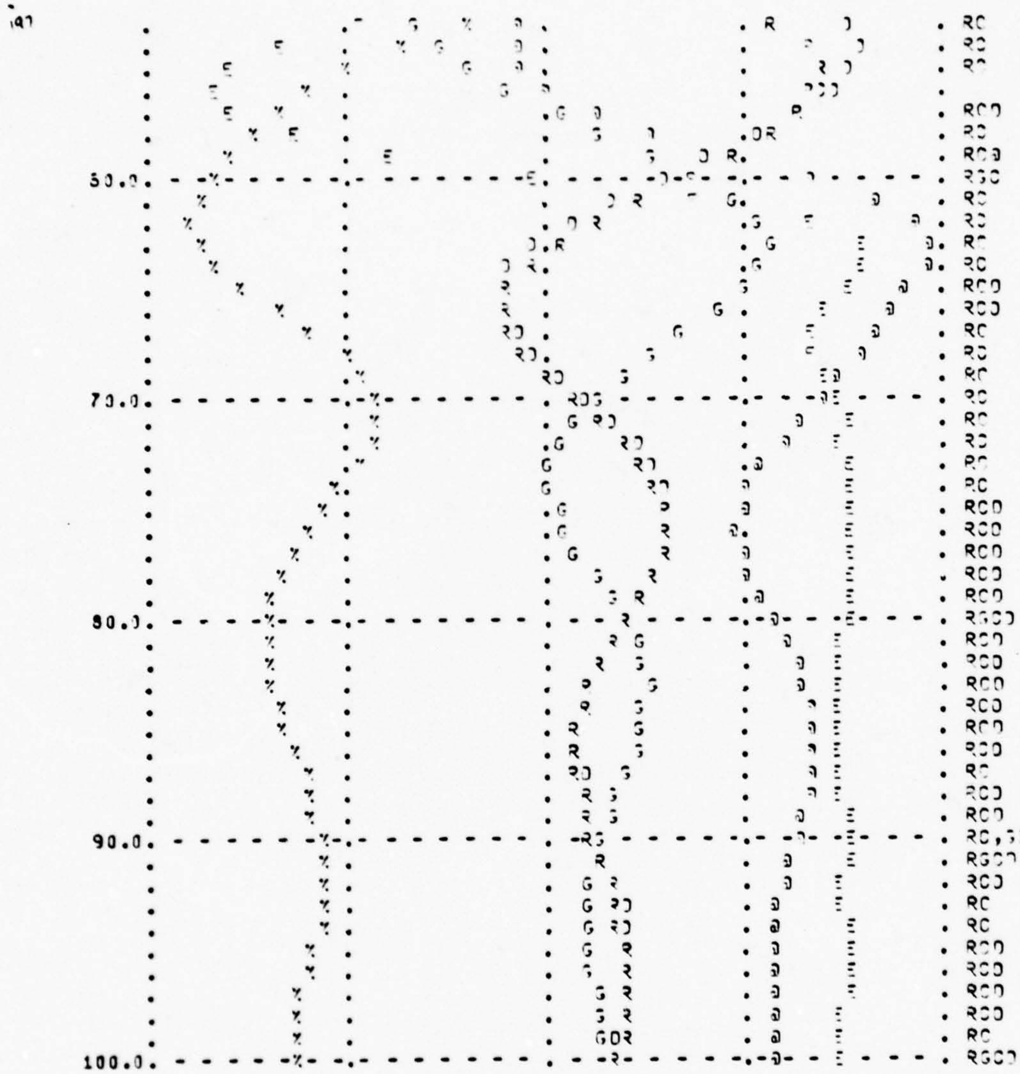
PAGE 29 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

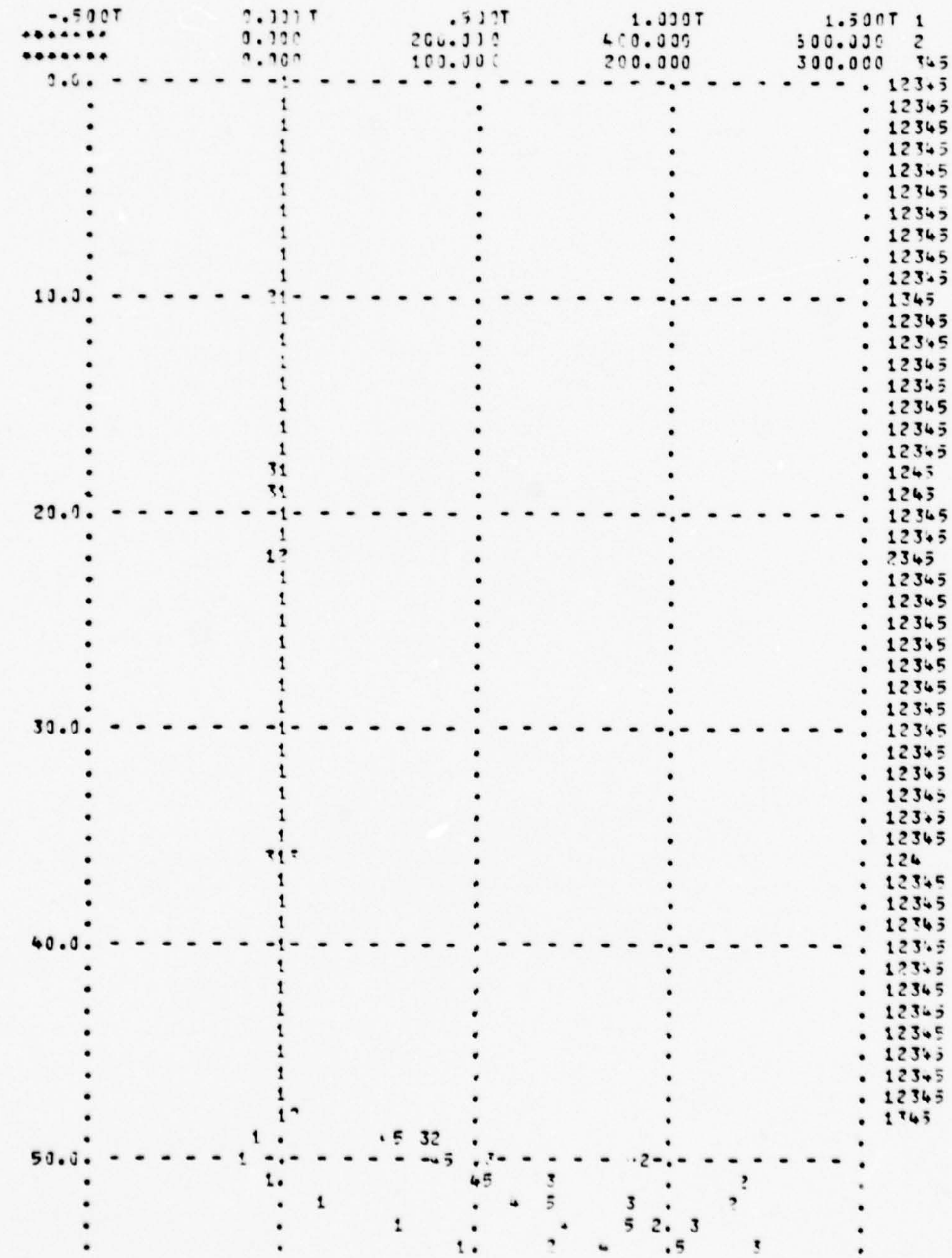
PRED=R UPT=G OSIZE=C OCSIZE=D TFINS=% FOFFC=E TPNSFO=@

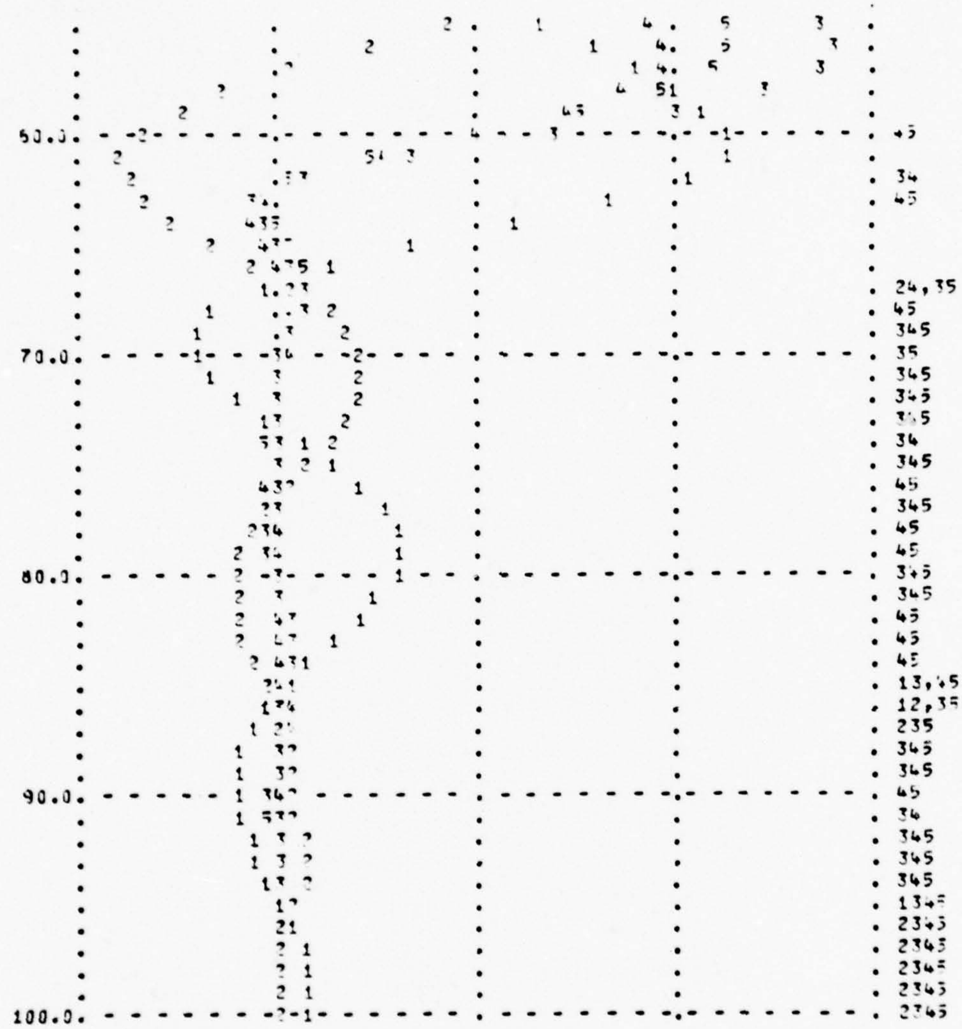



50.0
70.0
80.0
90.0
100.0

PAGE 30 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

OFDSC(1)=1 OFDSC(2)=2 OFDSC(3)=3 OFDSC(4)=4 OFDSC(5)=5




70.0
80.0
90.0
100.0

PAGE 31 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

CRATIO(3)=1 OCRATI(3)=2 CRATIO(4)=3 OCRATI(4)=4 CRATIO(5)=5
OCRATI(5)=6

```
  1.140          1.170          1.200          1.230          1.250  12
  2.700          2.300          2.900          3.000          3.100  34
  3.700          3.800          3.900          4.000          4.100  56
  0.0. - - - - - - -.- - - - - - - .- - - - - - - -3- - - - -1- - . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
 10.0. - - - - - - -.- - - - - - - .- - - - - - - -3- - - - -1- - . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          21    . 3456
     .              .              .              3          21    . 3456
 20.0. - - - - - - -.- - - - - - - .- - - - - - - -3- - - - -1- - . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
 30.0. - - - - - - -.- - - - - - - .- - - - - - - -3- - - - -1- - . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .             53          21    . 346
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
 40.0. - - - - - - -.- - - - - - - .- - - - - - - -3- - - - -1- - . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .              3          1     . 12,3456
     .              .              .   5 3        1          2     . 146
 50.0. - - - - - - -.- - - - - - - .5-3- - -1- - -4- - - - -2- - . 46
     .              .          5   3    1         4          2     . 46
     .              .     5    3   1              4          2     . 46
     .              3      31      .              4          2     . 46
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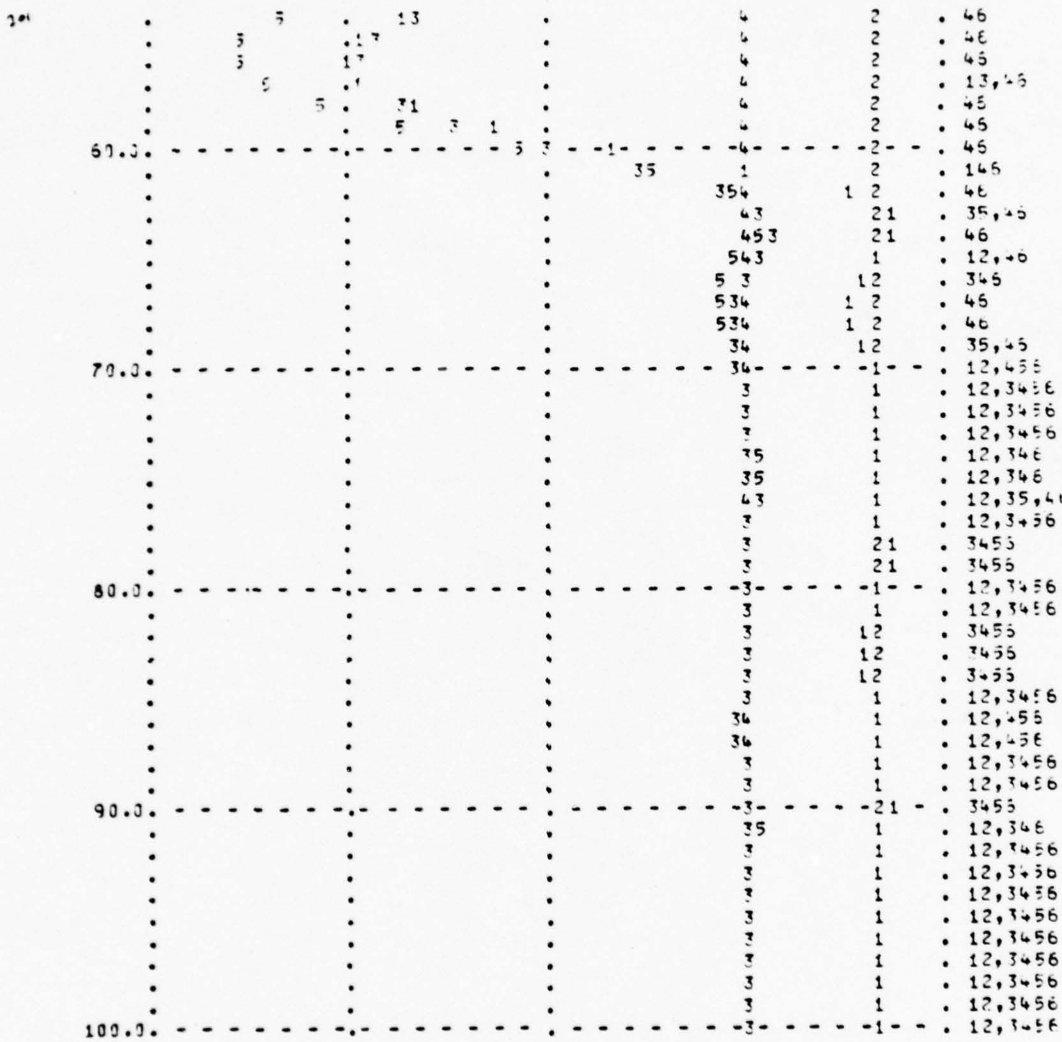

APPENDIX I

FORECAST LISTING

APPENDIX I

Forecast Listing

The first part of this appendix prints the model output every fourth quarter. The variables are listed first and the scales are next at E.00. If there were changes initiated when the computer run was made, they would be listed first; then a series of plots of the variables across time follows.

In this appendix, the entire model listing follows the computer run.

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PAGE 16 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL

I -- FORECAST

CHANGES FOR FERIN - NOISE

ORIGINAL N4	0.000	0.000	0.000	0.000	0.000
PRESENT N4	.200	.200	.200	.200	.200
ORIGINAL H4	0.000	0.000	0.000	0.000	0.000
PRESENT H4	1.000	1.000	1.000	1.000	1.000
ORIGINAL TS4	4.000	4.000	4.000	4.000	4.000
PRESENT TS4	48.000	48.000	48.000	48.000	+3.000

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PAGE  17  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL                NOISE

  TIME      JOB     TRNT     NEED   DFORCE      ATT     WIND   DIMFOR
              2        2        2        2        2    TRINS   DIFFOR
              3        3        3        3        3      CAP   DOFFOR
              4        4        4        4        4   TONEED    DSIZE
              5        5        5        5        5    FORCE   DDSIZE
           HERR   DECOST     FATT   CRATIO   DCRATI      ATJ   AHOURS
              2        2     PREC        2        2        2        2
              3        3   TRNGFC        3        3        3        3
              4        4    FOEFC        4        4        4        4
              5        5     TDEL        5        5        5        5
          SCOST    RCOST     TRAV
          PCOST    ACOST
          TCOST   TOTCOS
          UCOST    DCOST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   E-00    E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-03     E-00     E-00     E-00     E 03
           E-00     E-00     E-00     E-00     E-00     E-00     E-00
           E-00     E-00     E-00     E-00     E-00     E-00     E 03
           E 05     E 05     E-00
           E 05     E 05
           E 06     E 05
           E 05     E 05
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   0.00  3425.0   353.33       0.   3425.0    59.76   1540.8   11615.
          640.0    58.5-    52.60    640.0   12.376   1.8800   13055.
         4373.0   959.3    452.08   4375.0    89.38   1.0000   15040.
         3000.0   587.03   310.00   3000.0    54.19   1136.9   1203.2
         3600.0   520.90   372.00   3500.0    75.54      0.0   1203.2
             0.      1.0   1203.2       0.       0.   12.000       0.
             0.     0.00   300.80       0.       0.   16.000       0.
         43.000     -.00   211.12   1.2500   1.2500   12.000   210.00
         25.000     -.00   1.0000   3.0000   7.0000   12.000   75000.
         30.000     -.00   7.0000   4.0000   4.0000   12.000   103.00
             0.     0.00   1.0000
           0.00     0.00
             0.       0.
             0.       0.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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4.00	3411.4	353.17	0.	3417.7	65.56	1540.3	11522.
	647.3	70.73	52.81	645.9	14.216	1.6796	13050.
	4374.3	851.1	452.93	4375.0	94.91	1.0000	15040.
	3001.5	591.23	308.62	3000.0	55.70	1195.4	1215.8
	3600.0	520.52	372.03	3600.0	57.52	8.0	1215.1
	0.	5.2	1208.2	0.	0.	12.001	0.
	0.	-.47	304.19	0.	0.	16.000	0.
	48.008	.77	211.20	1.2498	1.2500	12.000	210.00
	24.987	-1.50	1.0001	3.0015	3.0000	12.000	75000.
	30.000	.01	7.0000	4.0000	4.0000	12.000	108.00
	457.	15.77	.9996				
	12.32	3.02					
	1325.	2035.					
	293.	1939.					
8.00	3396.2	348.98	0.	3409.0	70.71	1540.6	11529.
	655.5	71.91	52.17	653.7	12.228	1.8559	13055.
	4375.1	864.9	453.51	4375.0	98.28	1.0000	15038.
	2999.8	579.87	309.60	3000.0	54.33	1186.2	1215.8
	3601.2	521.27	370.71	3600.0	76.12	4.8	1213.4
	0.	12.9	1208.5	0.	0.	12.003	0.
	0.	-1.91	304.20	0.	0.	16.000	0.
	47.999	-.12	211.35	1.2500	1.2500	12.000	210.00
	25.002	.27	1.0001	2.9998	3.0000	12.000	75000.
	29.930	-1.23	7.0000	4.0014	4.0000	12.000	108.00
	915.	31.73	.9999				
	24.65	6.05					
	2549.	4193.					
	567.	3815.					
12.00	3427.0	357.41	0.	3420.4	71.24	1543.7	11615.
	634.2	57.02	58.68	640.4	13.483	1.8673	13055.
	4376.0	878.1	451.98	4375.0	92.21	1.0000	15036.
	2998.5	595.13	311.48	3000.0	59.76	1194.4	1137.0
	3599.5	519.90	372.26	3600.0	75.80	-4.4	1207.8
	0.	-6.5	1212.2	0.	0.	11.993	0.
	0.	6.19	299.25	0.	0.	16.000	0.
	47.989	-1.00	211.35	1.2503	1.2500	12.000	210.00
	25.012	1.44	.9999	2.9986	3.0000	12.000	75000.
	30.003	.41	7.0000	3.9995	4.0000	12.000	108.00
	1372.	47.37	1.0011				
	36.98	9.05					
	3975.	5234.					
	853.	5446.					

16.00	3424.2	355.91	0.	3413.6	59.55	1542.8	11516.
	640.9	66.20	52.66	640.7	13.163	1.8835	13059.
	4373.5	963.1	454.73	4375.0	81.49	1.0000	15034.
	3000.7	580.42	309.37	3000.0	52.79	1190.8	1207.2
	3598.3	520.37	373.87	3600.0	75.76	-1.6	1209.9
	0.	-5.5	1211.5	0.	0.	11.998	0.
	0.	-.24	301.81	0.	0.	16.000	0.
	48.016	1.47	211.39	1.2496	1.2500	12.000	210.00
	24.934	-.73	.9998	3.0107	3.0000	12.000	75000.
	30.014	1.55	7.0000	3.9932	4.0000	12.000	108.00
	1830.	63.04	.9994				
	49.33	12.10					
	5302.	8735.					
	1139.	5929.					
20.00	3447.5	365.37	0.	3437.0	75.12	1542.9	11503.
	627.0	60.55	52.69	627.7	11.775	1.8884	13077.
	4377.5	955.1	449.66	4375.0	95.50	1.0000	15040.
	3000.5	579.99	309.06	3000.0	54.79	1164.4	1184.1
	3599.3	520.53	372.97	3600.0	56.87	-12.4	1190.0
	0.	-10.4	1202.4	0.	0.	12.002	0.
	0.	.51	298.03	0.	0.	16.000	0.
	47.971	-2.53	211.00	1.2507	1.2500	12.000	210.00
	24.996	-.53	1.0002	3.0105	3.0000	12.000	75000.
	30.005	.59	7.0000	3.9992	4.0000	12.000	108.00
	2288.	78.47	.9992				
	61.57	15.10					
	6630.	10435.					
	1422.	8271.					
24.00	3430.3	350.02	0.	3422.6	70.30	1540.2	11515.
	639.3	72.17	54.19	640.9	12.735	1.8999	13053.
	4375.6	958.1	451.50	4375.0	86.05	1.0000	15039.
	2998.8	585.05	311.11	3000.0	59.22	1189.9	1214.6
	3598.7	520.75	373.14	3600.0	65.16	9.1	1215.1
	0.	-7.5	1207.0	0.	0.	11.996	0.
	0.	1.54	303.65	0.	0.	16.000	0.
	47.934	-.57	211.15	1.2502	1.2500	12.000	210.00
	25.010	1.27	.9998	2.9988	3.0000	12.000	75000.
	30.011	1.27	7.0000	3.9986	4.0000	12.000	108.00
	2745.	94.01	.9997				
	74.01	18.11					
	7955.	12590.					
	1703.	9437.					

29.00	3422.2	358.37	0.	3429.4	53.43	1579.1	11515.
	644.0	54.14	49.75	640.0	11.306	1.8966	13061.
	4375.0	853.1	452.01	4375.0	80.38	1.0000	15044.
	3000.4	580.51	309.63	3000.0	59.35	1183.7	1222.7
	3599.1	519.86	372.61	3600.0	74.36	13.2	1221.5
	0.	7.2	1208.3	0.	0.	12.004	0.
	0.	-3.33	305.68	0.	0.	15.000	0.
	43.000	.07	210.93	1.2500	1.2500	12.000	210.00
	24.995	-.47	1.0000	3.0004	3.0000	12.000	75000.
	30.007	.87	7.0000	3.9990	4.0000	12.000	103.00
	3203.	109.77	.9988				
	86.32	21.12					
	9280.	14635.					
	1984.	10578.					

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32.00	3417.6	350.22	0.	3419.5	71.10	1540.2	11521.
	642.7	59.3	55.38	645.5	12.081	1.8332	13059.
	4374.2	960.2	453.15	4375.0	83.29	1.0000	15040.
	2998.6	385.25	311.87	3000.0	56.39	1191.4	1215.8
	3600.5	519.23	371.00	3600.0	72.00	10.9	1220.1
	0.	1.3	1209.2	0.	0.	11.395	0.
	0.	2.31	304.19	0.	0.	16.000	0.
	48.009	.87	211.19	1.2498	1.2500	12.000	210.00
	25.011	1.75	.9998	2.9986	3.0000	12.000	75000.
	29.996	-.45	7.0000	4.0005	4.0000	12.000	103.00
	3661.	125.47	1.0008				
	98.54	24.12					
	10504.	15773.					
	2265.	11539.					

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35.00	3420.0	360.37	0.	3429.3	73.55	1541.2	11510.
	642.9	53.13	45.95	635.4	13.445	1.8640	13055.
	4379.1	855.3	447.71	4375.0	92.50	1.0000	15040.
	3001.3	532.23	309.41	3000.0	58.02	1178.7	1193.2
	3596.3	521.81	375.60	3600.0	72.10	-8.7	1191.0
	0.	9.3	1199.6	0.	0.	12.009	0.
	0.	-7.32	299.66	0.	0.	16.000	0.
	47.955	-4.07	211.14	1.2512	1.2500	12.000	210.00
	24.989	-1.23	1.0002	3.0013	3.0000	12.000	75000.
	30.031	3.71	7.0000	3.9959	4.0000	12.000	103.00
	4119.	141.17	.9991				
	110.37	27.13					
	11923.	19375.					
	2550.	12437.					

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40.00	3439.9	332.17	0.	3427.7	71.53	1542.4	11611.
	631.2	71.27	56.12	635.3	13.315	1.8612	13073.
	4373.5	953.7	653.04	4375.0	39.77	1.0000	15033.
	3001.0	590.43	308.91	3000.0	50.04	1189.6	1174.8
	3600.3	520.73	371.55	3600.0	77.34	-16.6	1177.6
	0.	-12.2	1194.2	0.	0.	11.995	0.
	0.	4.55	293.70	0.	0.	16.000	0.
	48.015	1.47	211.12	1.2496	1.2500	12.000	210.00
	24.991	-1.07	1.0000	3.0010	3.0000	12.000	75000.
	29.997	-.77	7.0000	4.0004	4.0000	12.000	103.00
	4575.	156.67	1.0012				
	123.30	30.17					
	13255.	20974.					
	2834.	13230.					
44.00	3434.9	359.01	0.	3437.1	58.45	1540.7	11504.
	636.3	66.27	45.37	628.9	12.000	1.8568	13075.
	4376.4	953.7	450.28	4375.0	92.37	1.0000	15041.
	3001.0	580.40	308.41	3000.0	54.36	1174.1	1191.4
	3602.3	519.17	370.06	3600.0	55.07	-17.8	1170.9
	0.	2.1	1188.7	0.	0.	12.012	0.
	0.	-7.33	295.35	0.	0.	16.000	0.
	47.994	-1.42	210.96	1.2504	1.2500	12.000	210.00
	24.992	-.99	1.0004	3.0010	3.0000	12.000	75000.
	29.931	-2.25	7.0000	4.0025	4.0000	12.000	103.00
	5033.	172.17	.9993				
	135.53	33.12					
	14581.	23971.					
	3115.	14015.					
48.00	3438.5	340.37	0.	3419.4	132.55	1539.7	11522.
	632.3	79.33	66.13	547.4	24.374	1.8958	13055.
	4375.8	953.1	450.91	4375.0	174.77	1.0000	15042.
	2997.9	581.47	311.43	3000.0	118.78	1202.8	1193.8
	3597.9	523.52	374.34	3600.0	146.57	10.7	1213.5
	0.	-19.7	1202.8	0.	0.	11.981	0.
	0.	15.03	299.70	0.	0.	16.000	0.
	47.991	-.37	211.02	1.2502	1.2500	12.000	210.00
	25.018	2.11	.9997	2.9979	3.0000	12.000	75000.
	30.018	2.12	7.0000	3.9976	4.0000	12.000	103.00
	5491.	137.54	1.0016				
	147.36	36.17					
	15903.	25155.					
	3395.	14630.					

52.00	2709.2	8.02	0.	2100.7	31.15	1457.5	12330.
	1417.8	567.33	673.60	2005.3	33.750	2.4249	13056.
	4139.8	797.2	699.56	4375.0	143.78	1.1436	15121.
	2843.0	576.5	472.69	3000.0	104.50	2415.4	3477.9
	3404.5	477.17	573.35	3500.0	123.52	1753.7	3359.1
	0.	-158.5	2210.4	0.	0.	10.914	0.
	0.	587.37	846.70	0.	0.	16.000	0.
	50.727	235.13	216.40	1.1929	1.2500	12.000	210.00
	26.381	157.33	.9465	2.8430	7.0000	12.000	75000.
	31.722	135.47	8.0055	3.7529	4.0000	12.000	103.00
	5935.	221.27	.9732				
	160.03	41.57					
	17203.	27233.					
	3671.	15377.					
56.00	1468.9	.11	0.	2239.4	57.26	1464.4	12349.
	1965.7	193.31	90.64	1874.4	75.552	1.7407	17537.
	4072.8	953.1	761.35	4375.0	159.11	1.1422	15033.
	2798.6	750.2	525.47	3000.0	106.07	1991.3	3421.0
	3365.1	580.51	613.67	3500.0	122.70	1136.6	3233.1
	0.	771.7	2112.5	0.	0.	11.386	0.
	0.	-91.35	843.58	0.	0.	16.000	0.
	51.552	302.75	225.45	1.1536	1.2500	12.000	210.00
	26.835	211.41	.9318	2.7386	7.0000	12.000	75000.
	32.094	274.92	7.9952	3.7300	4.0000	12.000	103.00
	6353.	266.32	1.0581				
	171.54	46.30					
	19443.	20335.					
	4045.	15919.					
60.00	1154.1	217.87	0.	2109.0	43.83	1771.6	12275.
	1430.4	17.99	0.00	1300.3	37.467	1.5639	13213.
	4344.2	1115..	544.76	4375.0	173.15	1.0315	14334.
	2971.4	192.37	379.52	3000.0	117.77	1365.9	2315.3
	3582.5	665.54	441.65	3500.0	147.54	27.5	2161.3
	0.	954.7	2133.6	0.	0.	12.101	0.
	0.	-181.11	578.52	0.	0.	15.000	0.
	48.340	30.97	257.00	1.2412	1.2500	12.000	210.00
	25.241	28.67	.9930	2.3714	7.0000	12.000	75000.
	30.145	17.4	7.2207	3.3806	4.0000	12.000	103.00
	6791.	305.04	1.0516				
	134.47	51.87					
	19735.	31729.					
	4662.	15391.					

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64.00	2246.9	314.17	0.	2190.4	34.81	1916.4	11946.
	999.7	62.31	89.72	971.0	39.134	1.8138	13133.
	4367.2	1015.[illegible]	542.68	-375.0	172.39	1.0000	14136.
	3003.9	311.73	363.43	3000.0	124.27	1442.9	1313.2
	3591.3	618.92	446.81	3600.0	143.29	-528.0	1803.7
	0.	-55.7	2336.6	0.	0.	12.016	0.
	0.	-28.63	453.29	0.	0.	16.000	0.
	48.085	7.35	257.64	1.2478	1.2500	12.000	210.00
	24.958	-3.87	.9968	3.0038	3.0000	12.000	75000.
	30.073	8.73	7.0000	3.9903	4.0000	12.000	103.00
	7240.	331.2[illegible]	1.0071				
	199.41	57.47					
	21313.	34531.					
	5411.	15931.					

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68.00	2592.7	350.71	0.	2127.7	104.45	1953.7	12051.
	1015.4	191.09	165.07	1076.4	41.957	2.0357	13451.
	4367.1	1040.4	548.00	-375.0	174.84	1.0067	14179.
	2995.0	922.11	373.95	3000.0	119.37	1535.8	2067.1
	3594.9	627.37	448.61	3600.0	143.56	-278.3	2131.5
	0.	-465.1	2409.8	0.	0.	11.921	0.
	0.	61.07	516.76	0.	0.	16.000	0.
	43.096	7.95	251.20	1.2478	1.2500	12.000	210.00
	25.042	5.07	.9984	2.9950	3.0000	12.000	75000.
	30.042	5.07	7.0469	3.9944	4.0000	12.000	103.00
	7704.	355.70	.9915				
	214.58	63.37					
	22940.	37322.					
	6044.	17514.					

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72.00	2394.4	245.30	0.	2155.8	91.75	1741.0	12243.
	1215.5	214.7[illegible]	169.88	1267.9	43.358	1.9918	13252.
	4375.3	1027.7	541.56	4375.0	173.57	1.0421	14399.
	2999.9	914.67	370.92	3000.0	115.19	1527.1	2421.0
	3600.4	623.00	444.77	3600.0	145.13	91.9	2473.2
	0.	-279.5	2381.3	0.	0.	11.949	0.
	0.	52.42	605.24	0.	0.	16.000	0.
	47.997	-.22	242.39	1.2501	1.2500	12.000	210.00
	25.002	.21	1.0000	2.9998	3.0000	12.000	75000.
	29.997	-.40	7.2947	4.0004	4.0000	12.000	103.00
	8169.	394.51	.9834				
	228.34	59.22					
	24510.	39915.					
	6553.	17955.					

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76.00	2133.9	227.17	0.	2231.4	53.70	1709.3	12292.
	1330.0	177.7	119.73	1316.3	54.940	1.9534	13117.
	4375.8	1025.7	540.14	4375.0	177.98	1.0465	14493.
	3002.3	913.17	367.93	3000.0	124.91	1466.5	2455.0
	3603.1	513.37	440.70	3500.0	141.30	137.5	2445.6
	0.	57.7	2309.1	0.	0.	12.019	0.
	0.	-13.17	616.26	0.	0.	16.000	0.
	47.991	-.37	240.41	1.2502	1.2500	12.000	210.00
	24.931	-2.27	1.0006	3.0023	3.0000	12.000	75000.
	29.974	-3.1	7.3255	4.0035	4.0000	12.000	103.00
	8628.	416.77	.9964				
	242.68	75.07					
	25003.	42417.					
	7042.	19359.					
80.00	2139.6	286.37	0.	2239.5	93.25	1748.6	12203.
	1262.5	135.75	97.43	1227.6	52.337	1.9310	13002.
	4375.8	1013.7	536.71	4375.0	175.72	1.0312	14442.
	2999.5	312.33	370.37	3000.0	115.49	1448.9	2311.7
	3601.2	522.77	442.36	3600.0	137.43	-8.6	2277.9
	0.	90.7	2286.5	0.	0.	12.036	0.
	0.	-34.93	577.91	0.	0.	16.000	0.
	47.991	-.34	243.30	1.2502	1.2500	12.000	210.00
	25.004	.71	1.0001	2.9995	3.0000	12.000	75000.
	29.990	-1.71	7.2182	4.0013	4.0000	12.000	103.00
	9084.	447.30	1.0058				
	255.49	80.75					
	27483.	44027.					
	7575.	19718.					
84.00	2251.3	297.34	0.	2219.2	91.47	1774.4	12150.
	1187.5	151.20	121.52	1165.2	43.144	1.8832	13034.
	4370.3	1028.7	544.16	4375.0	132.59	1.0236	14373.
	2999.4	317.11	370.25	3000.0	124.34	1479.6	2235.3
	3599.8	621.03	443.68	3500.0	138.48	-73.9	2235.5
	0.	-32.1	2310.4	0.	0.	11.997	0.
	0.	-2.33	559.06	0.	0.	16.000	0.
	48.052	4.75	245.40	1.2486	1.2500	12.000	210.00
	25.005	.53	.9995	2.9994	3.0000	12.000	75000.
	30.002	.20	7.1654	3.9998	4.0000	12.000	103.00
	9541.	477.15	1.0036				
	270.51	86.51					
	28992.	47516.					
	8139.	19030.					

88.00	2277.5	282.4[illegible]	0.	2207.9	59.48	1753.2	12130.
	1193.0	157.[illegible]	133.74	1204.7	43.153	1.9066	13123.
	4375.6	1025.5	536.62	-375.0	159.77	1.0275	14339.
	3000.2	316.5[illegible]	369.94	3000.0	125.14	1468.0	2274.7
	3598.0	522.[illegible]	445.66	3600.0	150.33	-30.8	2237.8
	0.	-53.[illegible]	2318.6	0.	0.	11.985	0.
	0.	11.7[illegible]	566.66	0.	0.	16.000	0.
	47.983	-1.5[illegible]	244.00	1.2504	1.2500	12.000	210.00
	24.999	-.15	1.0000	3.0002	3.0000	12.000	75000.
	30.017	1.9[illegible]	7.1923	3.9978	4.0000	12.000	103.00
	10000.	505.70	.9978				
	284.77	92.29					
	30515.	50037.					
	8583.	19352.					
92.00	2255.7	273.4[illegible]	0.	2218.7	53.71	1747.8	12204.
	1217.9	164.4[illegible]	134.96	1228.7	43.572	1.9128	13037.
	4371.5	1024.1	542.95	-375.0	175.51	1.0330	14422.
	2999.7	313.31	370.49	3000.0	117.08	1492.4	2323.7
	3599.6	619.5[illegible]	444.01	3600.0	149.36	28.6	2347.9
	0.	-37.[illegible]	2319.3	0.	0.	11.985	0.
	0.	10.7[illegible]	582.42	0.	0.	16.000	0.
	48.039	3.5[illegible]	243.24	1.2490	1.2500	12.000	210.00
	25.003	.3[illegible]	.9996	2.9997	3.0000	12.000	75000.
	30.004	.4[illegible]	7.2308	3.9995	4.0000	12.000	103.00
	10453.	336.[illegible]	.9974				
	298.31	98.0[illegible]					
	32029.	52644.					
	9224.	19622.					
96.00	2186.2	253.0[illegible]	0.	2215.1	37.30	1742.2	12218.
	1250.3	155.2[illegible]	119.90	1242.7	50.162	1.8588	13048.
	4375.4	1026.[illegible]	539.22	-375.0	175.34	1.0324	14433.
	3001.5	314.3[illegible]	366.32	3000.0	122.25	1469.0	2324.0
	3602.4	520.4[illegible]	441.52	3600.0	139.31	20.0	2313.2
	0.	29.[illegible]	2293.2	0.	0.	12.012	0.
	0.	-7.59	581.01	0.	0.	16.000	0.
	47.995	-.3[illegible]	243.19	1.2501	1.2500	12.000	210.00
	24.995	-1.54	1.0004	3.0016	3.0000	12.000	75000.
	29.990	-2.3[illegible]	7.2268	4.0026	4.0000	12.000	103.00
	10913.	366.4[illegible]	.9989				
	312.76	103.9[illegible]					
	33529.	55134.					
	9755.	19954.					

100.00	2184.1	250.3	0.	2205.7	33.24	1748.7	12217.
	1276.6	153.07	131.86	1242.2	49.372	1.8859	13035.
	4374.5	1025.[illegible]	540.18	4375.0	175.31	1.0332	14423.
	2998.5	315.57	371.33	3000.0	120.58	1487.7	2332.1
	3599.5	522.72	444.36	3600.0	143.94	25.2	2337.6
	0.	71.5	2312.4	0.	0.	11.992	0.
	0.	5.62	583.03	0.	0.	16.000	0.
	48.005	.43	243.87	1.2499	1.2500	12.000	210.00
	25.010	1.18	.9998	2.9988	3.0000	12.000	75000.
	30.004	.50	7.2325	3.9994	4.0000	12.000	138.00
	11373.	596.73	1.0019				
	326.73	109.59					
	35030.	57731.					
	10295.	20085.					

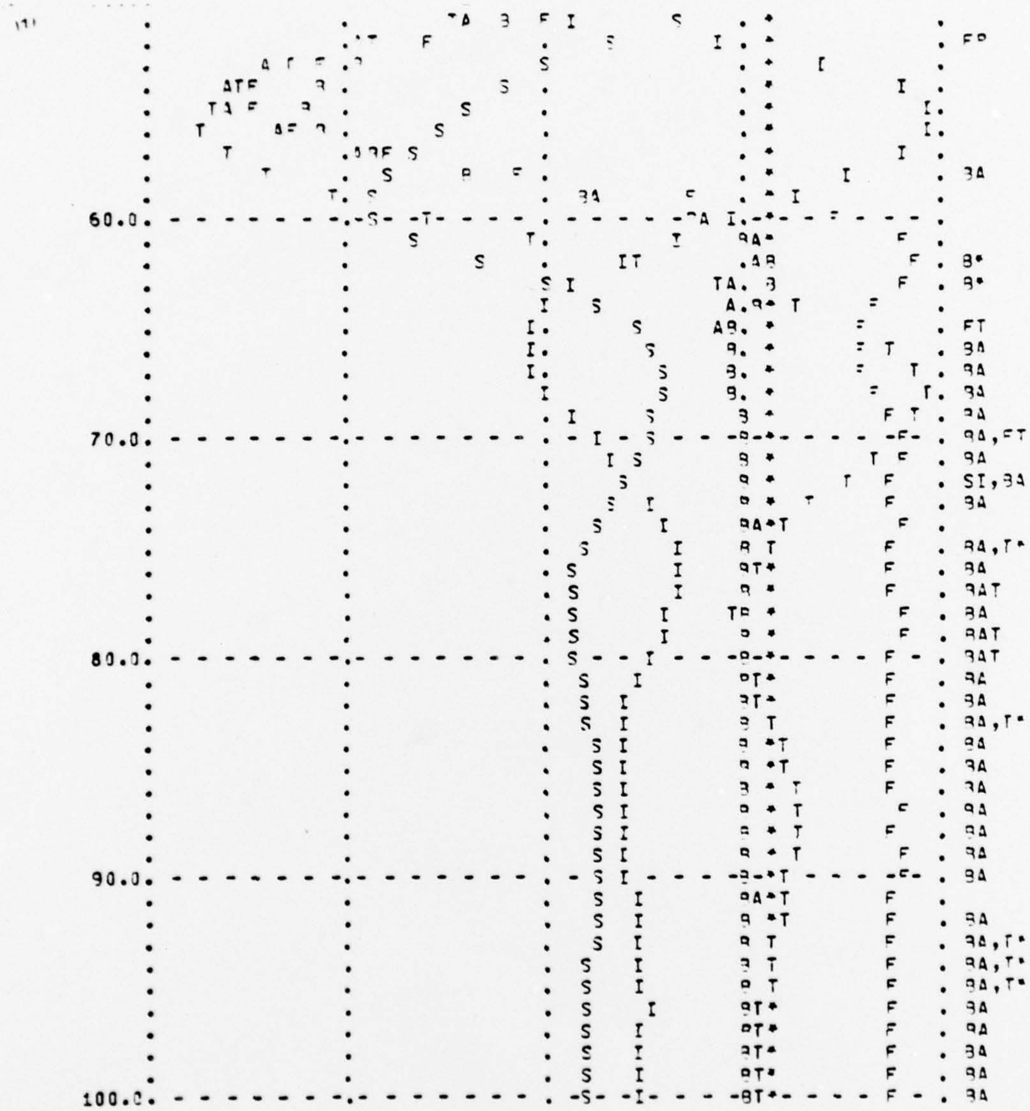
- -

179

PAGE 27 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

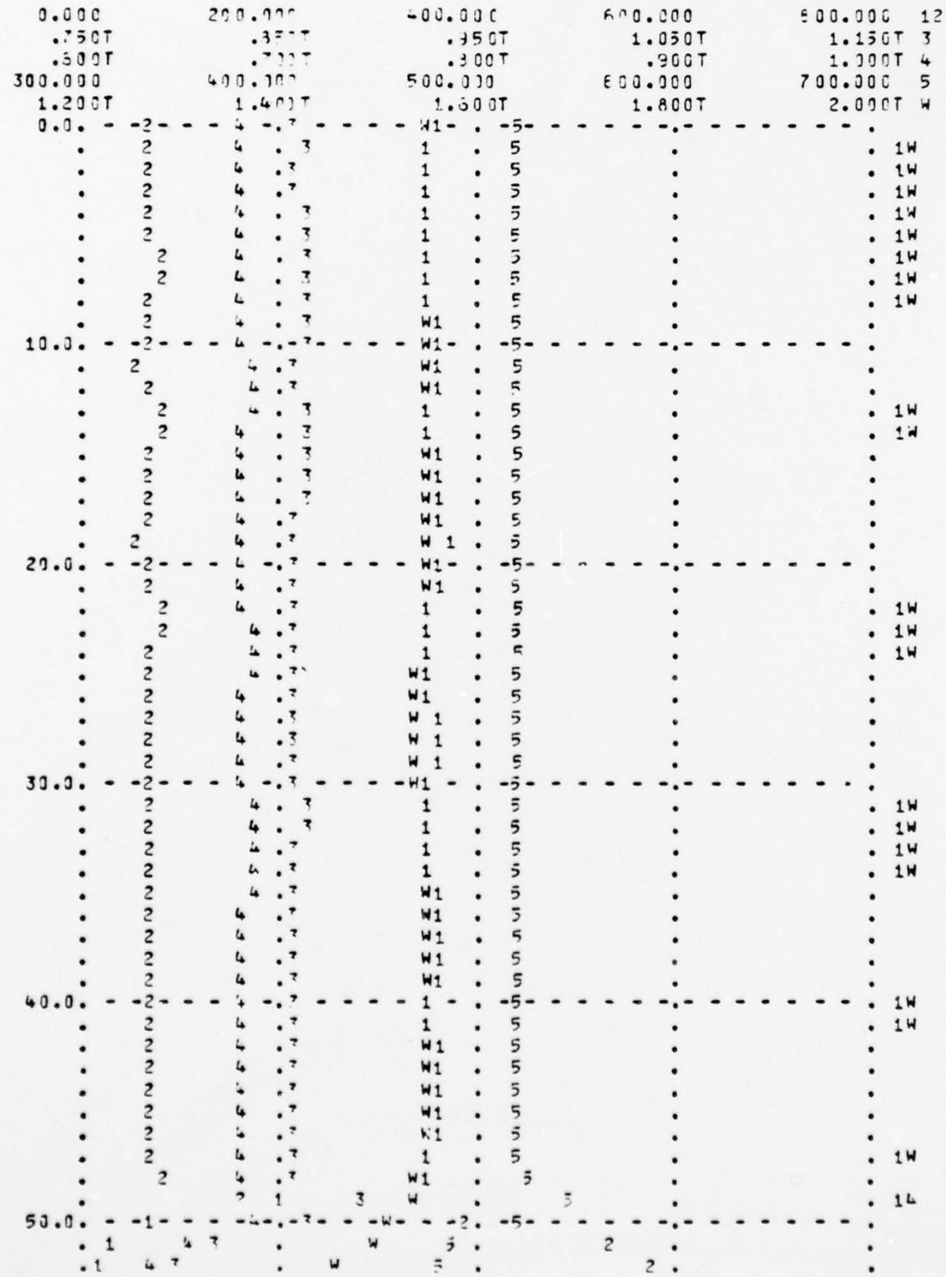
```
JOB(1)=S  JOB(2)=I  JOB(3)=F  JOB(4)=B  JOB(5)=A  TOTFOR=T
FORSIZ=*

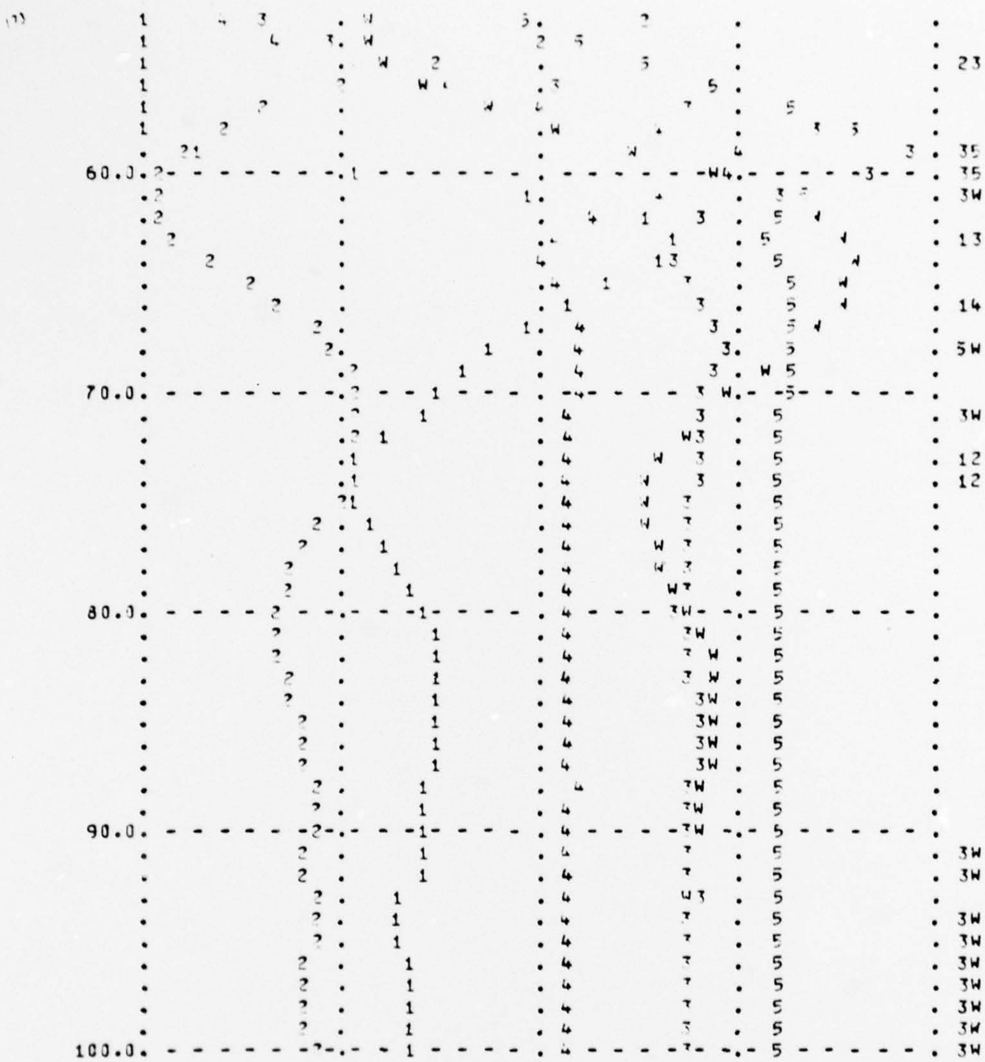
  0.000T          1.000T          2.000T          3.000T          4.000T S
  0.000T           .500T          1.000T          1.500T          2.000T I
  4.000T          4.100T          4.200T          4.300T          4.400T F
  2.700T          2.800T          2.900T          3.000T          3.100T B
  3.300T          3.400T          3.500T          3.600T          3.700T A
 17.300T         18.000T         18.500T         19.000T         19.500T T*
  0.0. - - - - - - -.- -I- - - - - . - - - - - - -B-T- -S- - F - . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .   I         .               B T   S    F   . BA,T*
     .               .   I         .               B T   S    F   . BA,T*
     .               .   I         .               B T . S     F  . BA,T*
 10.0. - - - - - - -.- -I- - - - - . - - - - - - -B-T- -S- - -F- . BA,T*
     .               .  I          .               B T   S     F  . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S     F  . BA,T*
     .               .  I          .               B T    S    F  . BA,T*
 20.0. - - - - - - -.- -I- - - - - . - - - - - - -B-T- - S - -F- . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
 30.0. - - - - - - -.- -I- - - - - . - - - - - - -B-T- -S- - F - . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .              AB T   S     F  . T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
 40.0. - - - - - - -.- -I- - - - - . - - - - - - -B-T- - S - F - . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T   S    F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .               B T    S   F   . BA,T*
     .               .  I          .     ABT      .F*  S          .
 50.0. - - - - - - -.- - - - I - - TA-B- - -F- - -S-*- - - - - - .
```


60.0
70.0
80.0
90.0
100.0

PAGE 28 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL NOISE

TRNG(1)=1 TRNG(2)=2 TRNG(3)=3 TRNG(4)=4 TRNG(5)=5 WIND=W

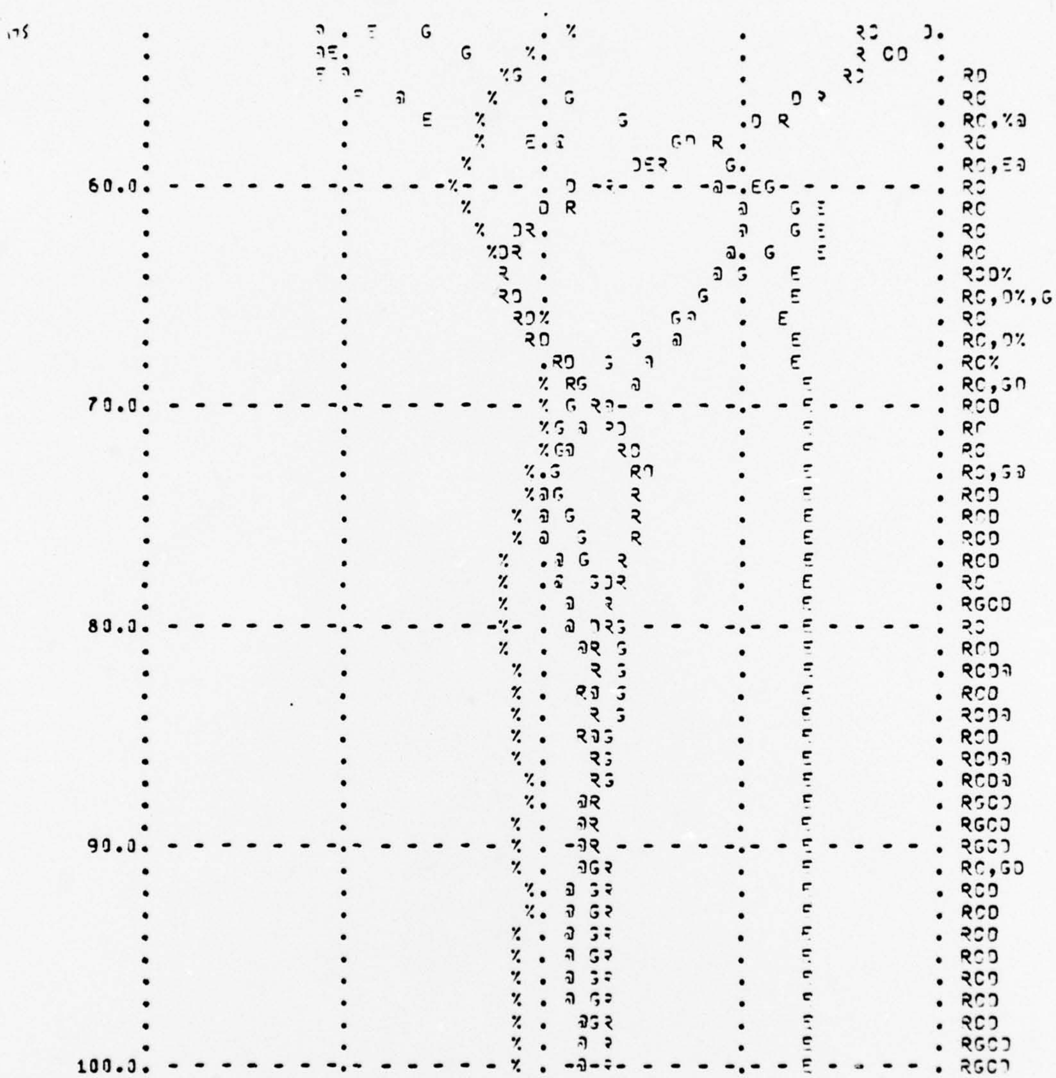



60.0
70.0
80.0
90.0
100.0

PAGE 29 PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL   NOISE

PRED=R UPT=G DSIZE=C DDSIZE=D TRINS=% EOFFC=E TRNSFD=@

```
0.000T          .250T          .500T          .750T          1.000T RG
0.000T         1.000T         2.000T         3.000T          4.000T CD
0.000          1.000          2.000          3.000           4.000  %
 .300           .330           .960           .990           1.020  E
 .200           .220           .240           .250            .280  @
 0.0. - - - @ - - -.- R - - - - % . - - - - - - - -.- - E - - - - - . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  RD        % .                .    E            . RGC
    .        @     .  R         % .                .    E            . RGCD
    .        @     .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
10.0. - - - @ - - -.- R - - - - % . - - - - - - - -.- - E - - - - - . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .        @     .  R         % .                .    E            . RGCD
    .        @     .  R         % .                .    E            . RGCD
    .        @     .  R         % .                .    E            . RGCD
    .        @     .  R         % .                .    E            . RGCD
    .        @     .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      . DR         % .                .    E            . RGC
    .       @      .  R         % .                .    E            . RGCD
20.0. - - - @ - - -.- R - - - - % . - - - - - - - -.- - E - - - - - . RGCD
    .       @      .  R          %.                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
30.0. - - - @ - - -.- R - - - - % . - - - - - - - -.- - E - - - - - . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
40.0. - - - @ - - -.- R - - - - % . - - - - - - - -.- - E - - - - - . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .       @      .  R          %.                .    E            . RGCD
    .       @      .  R         % .                .    E            . RGCD
    .           )  . G            .      R      D  .         %       . RC,DE
50.0. - - - - - - -)-.-G- - - - - - . - - -E- -R- -.- - - % ) - - -. RC
    .              @.  G            E               %.  R          D. RC
    .              @.     G     E   .      %           .     RD        D
```


60.0
70.0
80.0
90.0
100.0

```
PAGE  30  PILOT PRODUCTION-ALLOCATION MANAGEMENT MODEL             NOISE

  DFDSC(1)=1  DFDSC(2)=2  DFDSC(3)=3  DFDSC(4)=4  DFDSC(5)=5

   -.500T            0.000T             .500T           1.000T           1.500T 1
  *******            0.000            300.000          600.000          900.000  2
  *******            0.000            200.000          400.000          600.000  3
  *******            0.000            100.000          200.000          300.000  45
   0.0. - - - - - - -1- - - - - - - . - - - - - - - -.- - - - - - - - . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .             231              .                .                . 345
  10.0. - - - - - - 231 - - - - - - - . - - - - - - - -.- - - - - - - - . 345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              12              .                .                . 1345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
  20.0. - - - - - - -1- - - - - - - . - - - - - - - -.- - - - - - - - . 12345
      .             132              .                .                . 345
      .             12               .                .                . 2345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
  30.0. - - - - - - -1- - - - - - - . - - - - - - - -.- - - - - - - - . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              15              .                .                . 1234
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
  40.0. - - - - - - -1- - - - - - - . - - - - - - - -.- - - - - - - - . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .              1               .                .                . 12345
      .             132              .                .                . 345
      .             132              .                .                . 345
      .         1    .      3  45    .2               .                .
  50.0. 1 - - - - - -.- - - - 3 ---5 . - - - - - - - -.- -2- - - - - - .
      .  1           .           3   .  4   5         .       2        .
      .         1    .               .  3        4   2.                . 25
      .              .  1            .  2   3        4.      5         .
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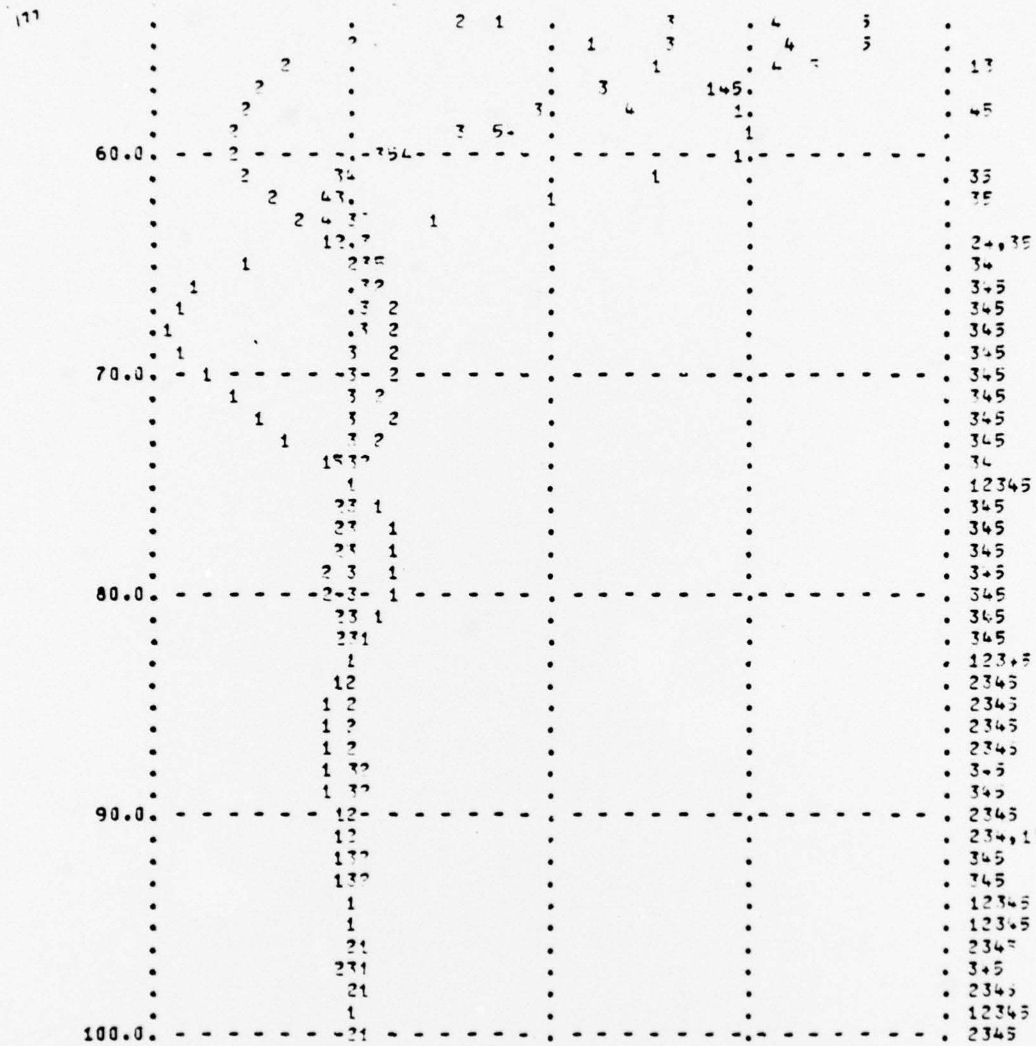
60.0
70.0
80.0
90.0
100.0

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  OCRATI(5)=6

    1.170              1.190              1.210              1.230              1.250  12
    2.700              2.800              2.900              3.000              3.100  34
    3.700              3.800              3.900              4.000              4.100  56
    0.0. - - - - - - - -.- - - - - - - - . - - - - - - - -3- - - - - -1- - . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
   10.0. - - - - - - - -.- - - - - - - - . - - - - - - - -3- - - - - -1- - . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            21     . 3456
       .                .                 .                3            21     . 3456
   20.0. - - - - - - - -.- - - - - - - - . - - - - - - - -3- - - - - -1- - . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
   30.0. - - - - - - - -.- - - - - - - - . - - - - - - - -3- - - - - -1- - . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .               53            21     . 346
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
   40.0. - - - - - - - -.- - - - - - - - . - - - - - - - -3- - - - - -1- - . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .                3            1      . 12,3456
       .                .                 .       5 3      1            2      . 146
   50.0. - - - - - - - -.- - - - - - -5. -3- - 1 - - -4- - - - - -2- - . 46
       .                .       5      3  1                4            2      . 45
       .             3  .       1         .                4            2      . 13,46
       .      5         1.3               .                4            2      . 46
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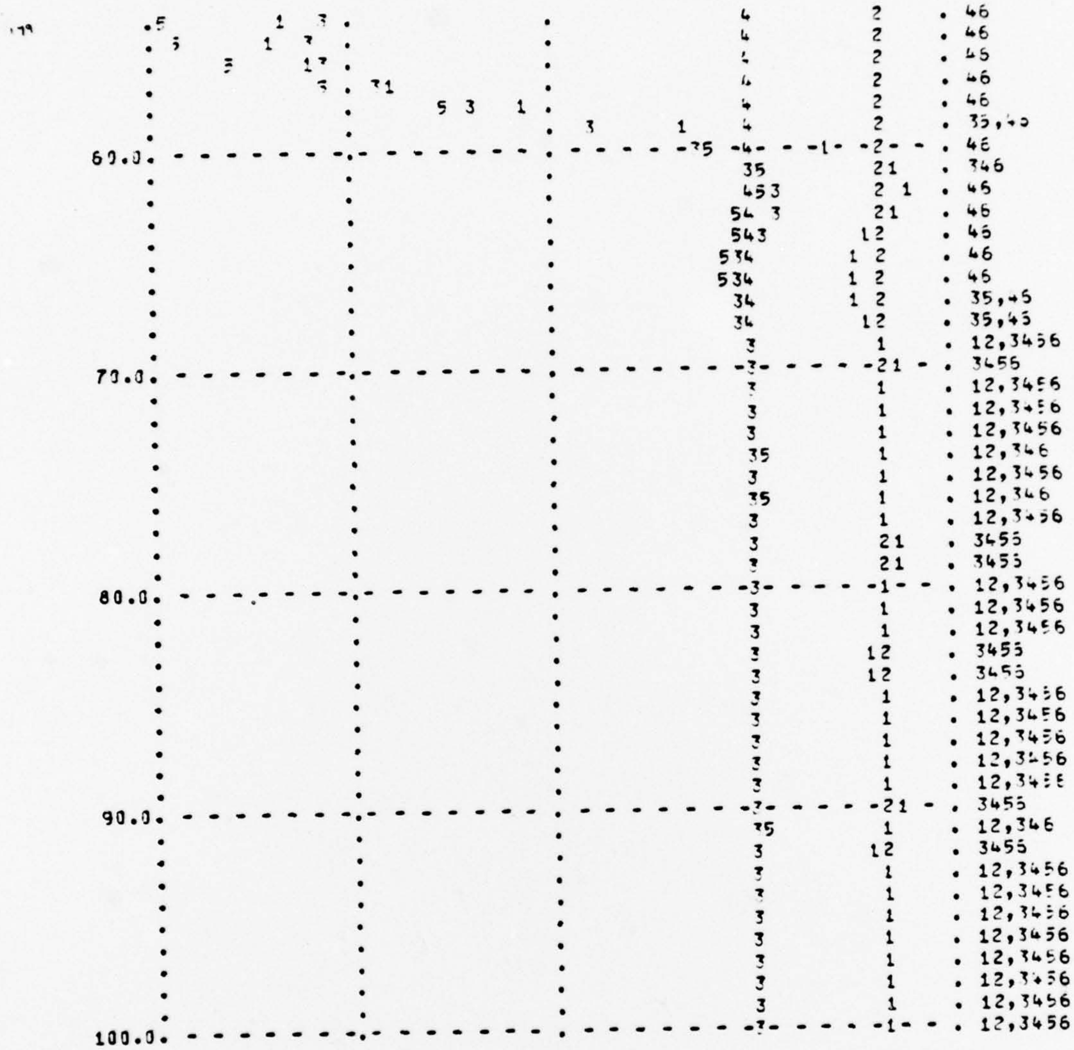
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Vita

Peter L. Fekke was born in San Diego, California, on December 27, 1943. He attended San Diego State College from which he graduated in 1965 with a Bachelor's degree in Mathematics and a commission in the United States Air Force.

After completing pilot training at Moody Air Force Base, Georgia, he operationally flew the KC-135 at Ellsworth Air Force Base, South Dakota, and in Southeast Asia. He next attended helicopter conversion school and eventually flew the HH-53 rescue helicopter out of Udorn Royal Thai Air Force Base, Thailand. He then flew the KC-135 at March Air Force Base, California. Later, he flew the FB-111 at Pease Air Force Base, New Hampshire.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This research was conducted to investigate the United States Air Force pilot production and allocation system. It applies system dynamics methodology as an effective means to analyze this complex system. The Pilot Production/Allocation Management Model (PP/AMM) is developed using DYNAMO III simulation language. The model is an aggregated representation of the system which deals with recruitment, allocation, and training of pilots. It divides pilot resources into three core forces, rated supplement resources, and Undergraduate Pilot Training instructor pilots. (continued)

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Initially, the system is analyzed by a discussion of a cost module and of system equilibrium. Next, various force build-up, draw-down, and attrition scenarios are analyzed. A change of management policy involving the forecasting of attrition rates concludes the analysis and demonstrates an application of the model. This example also shows how rapidly and economically information can be obtained from the model.