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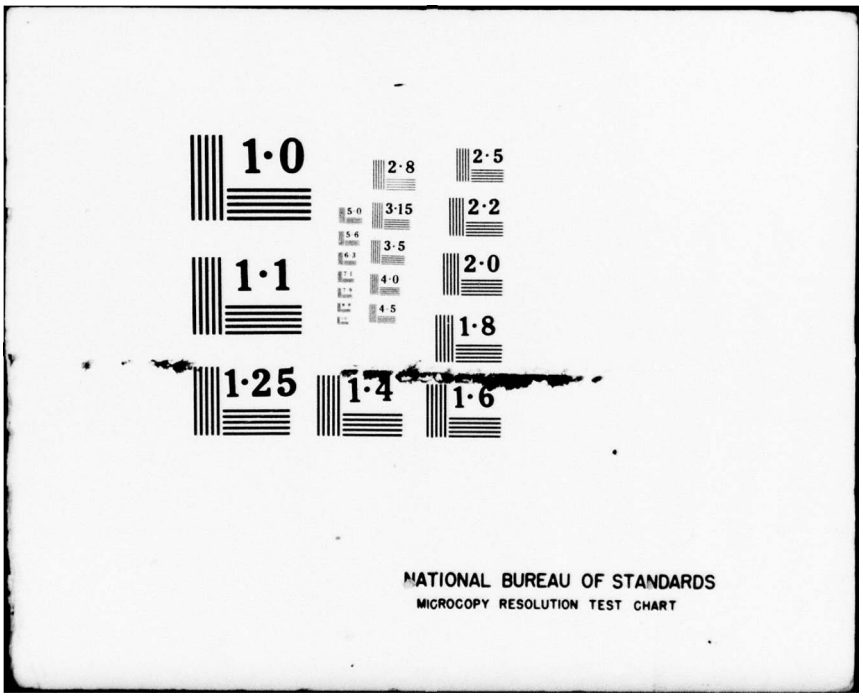
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A CASE STUDY OF JOB SATISFACTION AT A STRATEGIC AIR COMMAND BOMB WING

THESIS

AFIT/GSM/SM/77S-9 Alvin E. Krebs
Captain USAF

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Alvin E. Krebs, Jr., B. S.
Captain USAF
Graduate Systems Management

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PREFACE

This research was accomplished to find out if there were any differences in the job satisfaction levels and the factors affecting these levels for the four flying squadrons and the different crew positions of the 7th BMW, Carswell Air Force Base, Texas. I would like to express my appreciation to Colonel Edward L. Todd, Commander of the 7th BMW, for allowing this research to be conducted at Carswell. Also, I would like to thank the members of the 7th BMW for filling out the questionnaires and for taking time out during the week of 6-10 June 1977 to express their feelings to me.

I would like to thank my thesis adviser Major Saul Young for his guidance, encouragement, and support in the completion of this project. I would also like to thank my reader Lieutenant Colonel Roger Manley for his assistance in this research.

Special thanks go to my wife, Sheri, and her sisters Sylvia and Stephanie, for their help in coding the questionnaires. Finally, my very special thanks go to my typist, Denise Miller, for her patience and encouragement in typing this report.

Captain Alvin E. Krebs, Jr.

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ABSTRACT

This study was conducted to determine the job satisfaction levels and factors affecting them for the four flying squadrons--the 7th ARS, 9th BS, 20th BS, and the 4018 CCTS--of the 7th BMW, Carswell Air Force Base, Texas. A questionnaire composed of the Job Diagnostic Survey, developed by Hackman and Oldham, the Hoppock Measure of Job Satisfaction, organizational climate, and biographical questions was administered with 245 useable surveys returned. Job satisfaction levels and other factors were found to be significantly different between the 4018 CCTS and the other squadrons. The 4018 CCTS seemed to be highly satisfied and motivated. The 7th ARS appeared to be more satisfied with its supervisors, while no significant differences were found between the 9th BS and 20th BS. These two squadrons were low on most of the variables measured. When the different crew positions were examined--Pilot, Co-pilot, Radar Navigator, Navigator, Electronic Warfare Officer, Gunner, and Boom Operator--job satisfaction level differences were found only between Pilots and the Navigators and Electronic Warfare Officers. Pilots, Radar Navigators, and Gunners seemed to be fairly satisfied with their jobs, while the other three were less satisfied, especially the Electronic Warfare Officers, who were the lowest and significantly different from the other crew positions on most of the different factors of job satisfaction measured. Their lower OER ratings seem to have an influence on this dissatisfaction. Overall, the 7th BMW personnel perceived that

(cont'd p viii)

their job satisfaction stemmed from their own personal feelings about the job itself rather than from the objective characteristics of the job.

A CASE STUDY OF JOB SATISFACTION AT A STRATEGIC AIR COMMAND BOMB WING

I. INTRODUCTION

Statement of the Problem

In recent years much research has been done in industry and in the Air Force in the areas of job design and job satisfaction. In a literature review by Barrett, Dambrot, and Smith relating to job design, it was found that general surveys of the United States population indicated that 15-20 percent of the workforce was dissatisfied. The principal source of work dissatisfaction was concluded to be work specialization and decreased work autonomy. Also, dissatisfaction was found to be related to occupational level, age, education, race, sex, and other variables (1975:170).

The Air Force has become quite concerned with job satisfaction and the general attitude of its members toward their quality of life. In March 1975, the Air Force Management Information Group (AFMIG) was established by direction of the Air Force Chief of Staff. This group was directed to "make a good service better: by examining the organization and management of the Air Force as they relate to or impact on the human resource" (Ellis, 1975). To carry out these directions a comprehensive Quality of Air Force Life (QOAFL) survey was administered to Air Force personnel from grades E-1 to O-6, and from 0-32 years of service. Included in this survey were questions pertaining to job satisfaction and career intent along with other general and specific

questions concerning Air Force life. Studies conducted in the Department of Systems Management, Air Force Institute of Technology (AFIT), using data from the QOAFL survey have indicated "a steady decline in job satisfaction and career intent for non-rated personnel with less than four years of service and rated personnel with less than six years of service" (Vrooman, 1976:1). Even with all this research the Air Force has conducted another QOAFL survey during the spring of 1977. This shows continued concern about one of the most complex and challenging design activities that managers in the Air Force face today--the area of job design.

It is in the work place or the work situation that the interaction between the individual and the organization occurs. The problem that a manager faces is one of how the needs and goals of the individual are matched up with the requirements of the organization to produce a satisfied, motivated worker and a productive organization. In private industry, the manifestation of job dissatisfaction has shown up in increased turnover and absenteeism. In the Air Force this same manifestation has been related to negative career intent and retention problems. These problems harm the effectiveness of the organization.

In today's all-volunteer force, these problems, coupled with high personnel and training costs, make it necessary for the Air Force to have more information about job satisfaction and better ways to design its jobs so that more of its highly trained people can be retained. Other factors such as the "up or out" system and the new Officer Effectiveness

Reports (OER's) for officers have been postulated to have strong effects on a person's job satisfaction. Therefore, more research is needed in this area, especially if job satisfaction is a major factor in a person's decision about an Air Force career.

The day-to-day work situations in the Air Force are at the operational levels whether it be in a combat wing or in a system program office. This is where the interaction between the individual and the organization takes place in getting the work done. It is here that an individual makes his decision about making the Air Force a career. The satisfaction that an individual gets from his job and from the factors surrounding that job play an important part in determining his career intentions. The author will look at the job satisfaction levels and factors affecting job satisfaction at an operational combat wing.

Having been a member of the Seventh Bomb Wing (7th BMW), Strategic Air Command (SAC), Carswell Air Force Base, Texas for six years, the writer is very much concerned with the level of job satisfaction and the factors affecting it among the 7th BMW flight crew members. This research is pointed toward determining these levels of job satisfaction and the factors affecting it of the 7th BMW flight crew members. The results found may help Air Force managers in the complex problems associated with job design, job satisfaction, and other related areas.

BACKGROUND

Previous Air Force Studies

Many studies have been conducted at AFIT concerning the area of job satisfaction in various groups and organizations within the Air Force. In doing research on the personal value systems of men and women officers in the USAF, Bartholomew observed that "men and women with two-to-four years of service have very different value orientations than officers in other year groups of service. The result of this profile is dissatisfaction with the Air Force and quite negative career intentions" (1973:143). Madia, who also conducted research on personal value systems, recommended that the Air Force Military Personnel Center conduct a concentrated study of the "satisfactions and dissatisfactions of officers with three to four years of service" (Madia, 1974:140).

Recent Air Force Research

After the QOAFL survey was administered to 10,996 Air Force personnel, much research was done on this data. A study of job satisfaction of rated and non-rated officers and enlisted personnel was conducted by Thompson. He observed a decline in job satisfaction for non-rated officers and enlisted personnel with less than four years of service. The same decline of job satisfaction for rated officers was shown to occur at the five-to-six year point (1975:83,97).

Vrooman followed up these previous studies by analyzing the total sample population from the QOAFL survey, plus

breaking it down into groups of officers, rated officers, non-rated officers, and enlisted personnel. He was concerned with analyzing the factors associated with the job satisfaction and career intent of Air Force personnel with less than six years of service. He concluded that the factors associated with job satisfaction and career intent are essentially the same for all groups. Job satisfaction appeared to be more closely associated with job challenge and being prepared for future responsibility. Career intent is highly associated with growth opportunities, supervision, and personal standing (Vrooman, 1976:X).

Another study by Rigsbee and Roof examined job satisfaction as it related to the system program office (SPO) and the weapon acquisition process. They did not find a significant relationship between the stage of the weapon acquisition process and job satisfaction, but they found that the variable called level of organization was statistically significant in the overall satisfaction measurement. They concluded that managers who work at the top levels of organizations perceive the greatest sense of satisfaction (Rigsbee, 1975:56,57).

Keyserling, in looking at the impact of the current OER system on the junior officers of the Air Force, came up with some conclusions that could pertain to this study. He concluded that the problems caused by the imperfections of the new OER system were minor at the time his research was conducted. However, he said that "if the imperfections continue to be denied or ignored, misconceptions and rumors

will increase the magnitude of the problem out of proper perspective. The new problems can lead to demotivation and dissatisfaction, which could decrease the Air Force mission effectiveness" (Keyserling, 1976:vi). He recommended that "potential" be defined, scaled, and new criterion established. These recommendations are presently taking place at this writing but the population on which this research is based were not aware of any changes.

Scope

This research will compare overall job satisfaction levels between the four flying squadrons of the 7th BMW and job satisfaction levels between the different crew positions. The four squadrons are the 7th Air Refueling Squadron (ARS), the 20th Bomb Squadron (BS), the 9th Bomb Squadron (BS), and the 4018 Combat Crew Training Squadron (CCTS). The first three squadrons are the operational flying squadrons of the 7th Bombardment Wing (BMW) who fly day-to-day training missions and also sit seven-day alert tours. The crews of the 7th ARS are composed of a pilot (P), copilot (CP), navigator (N), and the boom operator (BO) who fly the KC-135 tanker. The 20th BS and the 9th BS crews are composed of a pilot, copilot, radar navigator (RN), navigator, electronic warfare officer (EW), and the gunner (G). These crews fly the B-52D model. The crews of the 4018 CCTS also fly the B-52D and KC-135, but this is an instructor squadron, training new bomber crews for all B-52D bases and instructors for both the B-52D and KC-135. The 4018 CCTS is composed of

instructor flight crews consisting of a pilot, radar navigator, electronic warfare officer, and a gunner for the B-52D and a pilot, navigator, and boom operator for the KC-135. Academic teams representing these crew positions fly as well as teach in the classroom.

Objectives of the Study

1. To analyze the job satisfaction levels and factors affecting job satisfaction among the crews of the 7th BMW by use of the Job Diagnostic Survey (JDS) and the Hoppock measure.

2. To determine if there are any differences in job satisfaction between the four flying squadrons of the 7th BMW.

3. To determine if there are any differences in job satisfaction between the different crew positions.

4. To attempt to find some recognizable structure to the relationship between job satisfaction and other variables included in the survey such as the demographic variables. A specific goal is to attempt to relate career intent and OER ratings to job satisfaction for officers.

Sample Plan

The researcher planned to use the short form of the JDS developed by Hackman and Oldham, the four questions of the Hoppock Measure of Job Satisfaction, some organizational climate questions, and pertinent demographic information in his survey questionnaire. The questionnaire was given out by the researcher to the flight crews on their mission planning days, and to the alert crews during a week in June

1977. The majority of the population of the four squadrons were available to complete the survey, unless they were sick or on leave.

After the questionnaires were collected by the author, the data was keypunched onto computer cards. Computer programs from the Statistical Package for the Social Sciences (SPSS) were run to statistically analyze the data. A Motivating Potential Score (MPS) from the JDS and an overall job satisfaction score from the Hoppock score was calculated. To analyze the statistical significance of the scores, regression analysis was used in addition to finding the means of different variables and their correlations. The SPSS programs can break the data down into the different squadrons and crew positions and analyses were made to find any job satisfaction differences.

Research Hypothesis

The levels of, and factors affecting job satisfaction differ among the crew members of the four flying squadrons and among the different crew positions.

II. JOB DESIGN AND JOB SATISFACTION

Relevant History

The beginning of job design and factors affecting job design such as job satisfaction probably go back to the industrial revolution in England. Technically untrained, uneducated farm people who constituted the labor force were only capable of doing the simplest industrial jobs; therefore, the jobs were fractionated so they could be learned quickly and workers could perform their duties effectively. These basic principles were carried forth into Frederick Taylor's scientific management theory. In his book Principles of Scientific Management, Taylor said that "perhaps the most prominent single element in modern scientific management is the task idea" (1911:59). His premise was that by studying the work to be done scientifically, jobs could be simplified and work could be carried out more efficiently. Less skilled workers would be required, the control of management would be increased, and ultimately organizational profits would be enhanced under this theory.

This approach to job design brought about the giant assembly lines as a major part of the industrial scene. Through the years people have become more educated but the planning and controlling of work was taken from the people who did the work, thus diminishing the aspects of the importance of the people who were getting the job done. One of Taylor's main premises was being violated. He had said that care should be taken to ensure that the worker was not

overqualified for the job. Even though the pay incentive has been good in these jobs, the effect has been negative. People have become passive and disinterested in the organization and their work. This disinterest has contributed to poor employee relations and its high cost (Smith, 1968:478).

Numerous researchers have shown that simple, routine, non-challenging jobs often lead to high employee dissatisfaction, to increased absenteeism and turnover, and to substantial difficulties in effectively managing employees who work on simplified jobs (Hackman and Lawler, 1971:259). To try to alleviate this problem a new approach to job design came into being called "job enlargement," whereby the worker was given an increase in the number of tasks and responsibilities so that jobs can grow and be more interesting. Researchers began to enlarge jobs and tried to determine whether or not worker productivity and satisfaction would increase. Most of these experiments were reported to be successful, but most of them were case studies and often lacked appropriate experimental controls.

Questions arose concerning the methodology used in job enlargement studies, especially in the absence of a conceptual or theoretical basis for the studies. Little cumulative knowledge had been gained from them regarding the effectiveness of job redesign. Since these experiments involved a number of simultaneous changes, there was little knowledge about which aspects of the redesigned job were responsible for the observed behavioral and attitudinal changes. In a study by Ronald C. Bishop and James W. Hill, job enlargement

was found to be of no greater influence than job changes without enlargement so far as worker's job satisfaction and tension were concerned (1971:175).

At this point in time there was no conceptual theory on which to base testable propositions about how job characteristics affect employees under various circumstances. The major implication of all previous research only showed the researcher and manager the importance of social, motivational, and attitudinal factors in the work situation and the need for more definitive research.

Recent Influences

Frederick Herzberg's two factor theory finally gave researchers something to work with relevant to job design. Herzberg determined through his research that the factors which make people satisfied with their job are not the same factors that make them dissatisfied with their job. The first set of intrinsic factors or "motivators" which lead to job satisfaction consisted of the characteristics of the work content such as achievement, responsibility, recognition for achievement, the work itself, responsibility and growth or advancement. The second set of factors which lead to job dissatisfaction, the extrinsic or "hygiene factors," primarily relate to aspects of the work environment. These factors are company policy and administration, supervision, interpersonal relationships, working conditions, salary, status and security (Herzberg, 1968:53-62).

Herzberg concludes that the most effective method of

motivating employees is to enrich the content of the job by providing greater opportunities for the employee's psychological growth. His theory brought about another term associated with job design, "job enrichment," which refers to studied redesign of jobs and tasks with a goal to enrich work by adding greater challenge, responsibility, variety, and/or independence.

The greatest value of Herzberg's theory is that it stimulated much research, some which showed it worked and many which have revealed only limited partial support, especially in the way data is gathered. Charles T. Hullin and T. K. Waters tested three variations of the two factor theory of job satisfaction and found the existence of two effects. The first is that intrinsic job factors are generally more potent for predicting overall job attitudes, and the second is that overall job satisfaction is more predictable than overall job dissatisfaction. Neither effect requires the assumption of the discontinuity of satisfaction and dissatisfaction or the assumption of dimensional intrinsic and extrinsic job factors (1971:211). This study and other studies show that the status of Herzberg's theory is uncertain.

The main problem with Herzberg's theory is that it has not shown how to specify how characteristics of workers interact with the presence or absence of the five motivating conditions in determining worker performance and satisfaction (Hackman and Lawler, 1971:260). It also does not specify how the presence or absence of these motivating conditions

can be measured for existing jobs. This particular measurement problem has been addressed by Arthur N. Turner and Paul P. Lawrence in 1965. They focused on the response of workers to technologically-determined variations in the nature of their work. A scheme was developed for classifying and measuring relevant task attributes. Forty-seven different jobs in eleven industries were studied and their characteristics measured in terms of such attributes as variety, autonomy, interaction, knowledge and skill, and responsibility. The measure of these attributes, between which there was a high degree of covariance, were combined into an overall Requisite Task Attribute Index (RTA) (1965:109-130). This summary index was used in showing the relationship between the attributes of the jobs and worker, job satisfaction, and attendance.

Turner and Lawrence found out through this study that their expectations that employees working on jobs which were high on the RTA Index would have higher job satisfaction and lower absenteeism was not fully supported. They found out that their predictions only held for workers from factories in small towns. It was then argued that the obtained differences in reactions to high RTA Index jobs were substantially moderated by differences in the cultural backgrounds of employees (Hackman and Lawler, 1971:261).

The data obtained by Turner and Lawrence plus that found by other researchers questions the proposition that enlarged or enriched jobs lead to improved job satisfaction, attendance, and/or performance. It appears that certain characteristics

of the employees themselves must be taken into account simultaneously with the characteristics of their jobs in order to generate valid predictions about the behavioral and affective responses of employees at work.

This new approach to job design of looking at the characteristics of the employee and his needs is partially based on the psychological theory of motivation formulated by Maslow (1943, 1965). Maslow described a hierarchy of human needs consisting of (1) physiological, (2) safety, (3) belongingness, (4) esteem, and (5) self-actualization. These needs are in the order of their dominance.

If a person's needs are unsatisfied, he will seek to satisfy the most dominant first and only after this need is satisfied will the next level need become an important motivator (Maslow, 1954:94). Herzberg in his two factor theory also referenced Maslow's work. He said that the lower order needs in our society are basically fulfilled, so job satisfaction appears to basically be a function of higher order need fulfillment such as self-actualization (Rigsbee and Roof, 1975:6).

Along with Maslow's hierarchy of needs theory another theory which has become the basis for recent job satisfaction research is the expectancy theory of motivation. This theory was formulated by Lewin (1938) and Tolman (1959) and applied to work settings by Vroom in 1964, and Porter and Lawler in 1968. Based on these two theories, Hackman and Lawler came up with a conceptual framework of the interaction between job characteristics and individuals in 1971.

They suggested five propositions that address the specific problem of how employee motivation can be enhanced through the design of jobs. These five propositions are as follows:

> 1. If an individual believes that he can obtain an outcome he values by engaging in a particular behavior, the likelihood that he will actually engage in that behavior is enhanced.
> 2. Individuals value outcomes to the extent that they satisfy the physiological or psychological needs of the individual, or to the extent that they lead to other outcomes which satisfy such needs or are expected by the individual to do so.
> 3. Thus, to the extent that conditions at work can be arranged so that employees can satisfy their own needs by working effectively toward organizational goals, employees will in fact tend to work hard toward the achievement of these goals (McGregor, 1960).
> 4. Most lower level needs, physical well-being, and security, can be reasonably well satisfied for individuals in contemporary society on a continuous basis and therefore will not serve as motivational incentives except under unusual circumstances. This is not the case for higher order needs as pointed out by Maslow in his theory of human motivation dealing with a hierarchy of needs.
> 5. Individuals who are capable of higher order need satisfaction will in fact experience such when they learn that they have as a result of their own efforts accomplished something that they personally believe is worthwhile or meaningful (Hackman and Lawler, 1971:262-263).

These five propositions lead to the conclusion that it may be possible under specifiable conditions to simultaneously achieve high employee satisfaction and high employee efforts toward achieving organizational goals. To establish conditions for internal work motivation to accomplish this, it appears that a job must have these three characteristics: (a) allows workers to feel personally responsible for an identifiable and meaningful portion of the work, (b) provides work outcomes which are intrinsically

meaningful or otherwise experienced as worthwhile, and (c) provide feedback about performance effectiveness. In measuring these three characteristics, Hackman and Lawler used four of the requisite task attributes proposed by Turner and Lawrence, which they called the core dimensions of variety, autonomy, task identity, and feedback.

In their 1971 study, Hackman and Lawler found that when jobs are high on the four core dimensions, employees who are desirous of higher order need satisfaction tend to have high motivation, have high job satisfaction, be absent from work infrequently, and be rated by supervisors as doing high quality work. This conclusion did not hold for those people who were not desirous of higher order need satisfaction.

THE JOB CHARACTERISTIC MODEL

Psychological States

In 1974 Hackman and Oldham presented a theory of job characteristics and individual responses to the work based on the earlier research by Turner and Lawrence (1965) and by Hackman and Lawler (1971). The basic theory proposes that positive personal and work outcomes (high internal motivation, high work satisfaction, high quality performance, and low absenteeism and turnover) are obtained when three "critical psychological states" are present. These three states are the three job characteristics of the Hackman and Lawler study (1971). They are: experienced meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the work activities (May 1974a:2).

The three psychological states are the causal core of the model developed by Hackman and Oldham based on their theory. These researchers say that the "model postulates that an individual experiences positive affect to the extent that he learns (knowledge of the results) that personally (experienced responsibility) he has performed well on a task that he cares about (experienced meaningfulness)" (December 1974c:8). These states are critical in determining personal motivation and job satisfaction and they must be present for the positive outcomes to be realized. They are defined as follows:

> Experienced Meaningfulness of the Work. The degree to which the individual experiences the job as one which is generally meaningful, valuable, and worthwhile.
>
> Experienced Responsibility for Work Outcomes. The degree to which the individual feels personally accountable and responsible for the results of the work he or she does.
>
> Knowledge of Results. The degree to which the individual knows and understands, on a continuous basis, how effectively he or she is performing the job (December 1974c:9).

The theory proposes that the three critical psychological states are created by the presence of five "core" job dimensions. These job dimensions are the four proposed by Turner and Lawrence plus a fifth one called "task significance." The relationships among the core job dimensions, the critical psychological states, and on-the-job outcomes are shown in Figure 1.

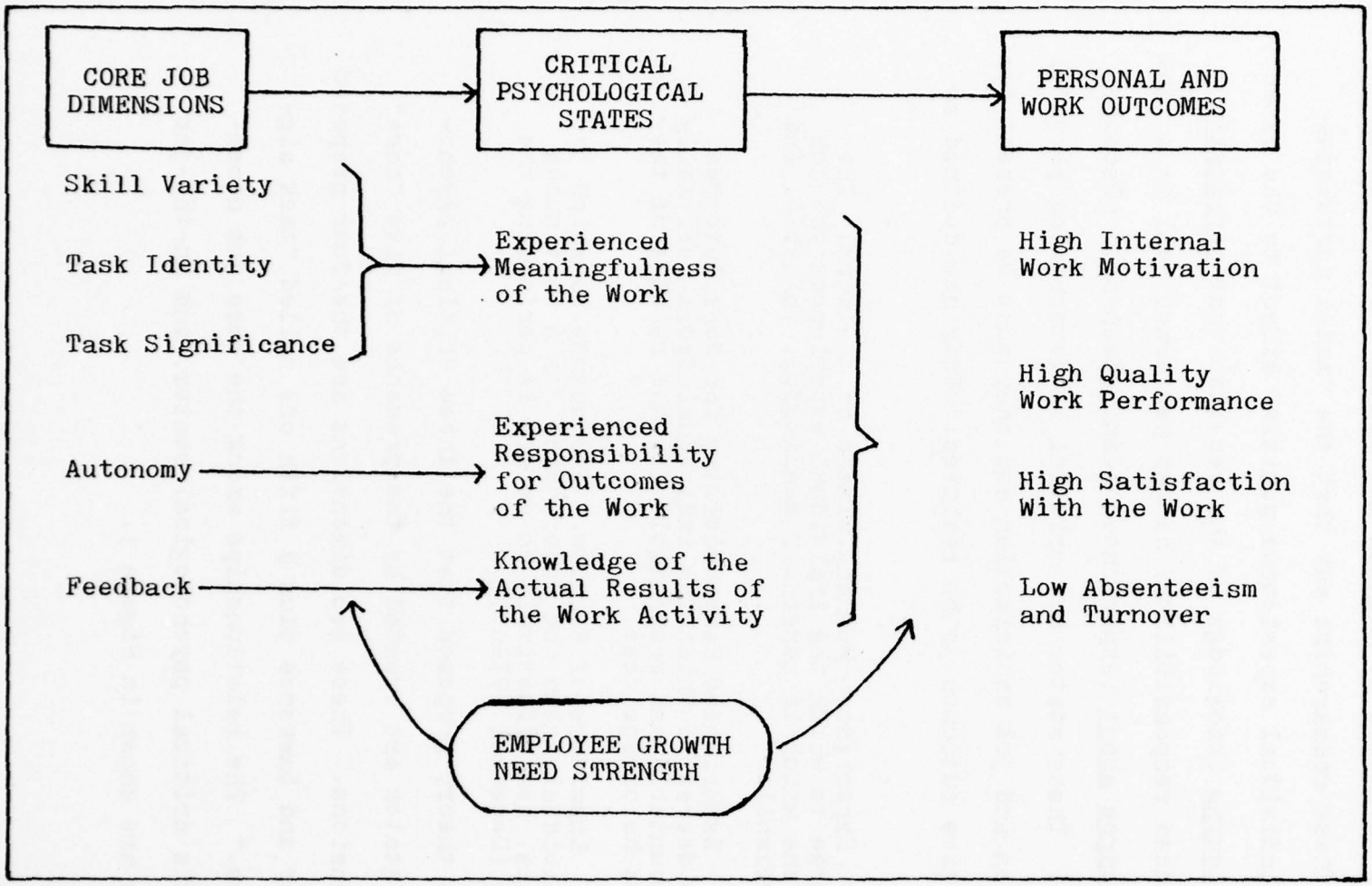

Fig. 1. The Job Characteristics Model of Work Motivation (Hackman and Oldham, 1974c:8A)

Job Dimensions

Hackman and Oldham have identified five measurable characteristics of jobs which when present, improve employee work motivation, satisfaction, and performance. These five dimensions and their relationship to the three critical psychological states are defined in the following discussion (December 1974c:9-11).

Skill variety, task identity, and task significance combine additively to determine the experienced meaningfulness of a job.

> 1. Skill Variety. The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person.
>
> 2. Task Identity. The degree to which a job requires completion of a "whole" and identifiable piece of the work--that is, doing a job from beginning to end with a visible outcome.
>
> 3. Task Significance. The degree to which a job has a substantial impact on the lives or work of other people--whether in the immediate organization or in the external environment.

The "core" dimension that contributes toward experienced responsibility is autonomy. It is defined as follows:

> Autonomy. The degree to which a job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.

Feedback is the job dimension that contributes to the critical psychological state, knowledge of results. It is defined as follows:

> Feedback. The degree to which carrying out the activities required by a job results in the individual obtaining direct and clear information

about the effectiveness of his or her performance.

The Overall "Motivating Potential"

As a summary index that can reflect the overall potential of a job to prompt high internal work motivation on the part of job incumbents the five dimensions are combined into a single score. The score, called the Motivating Potential Score (MPS), was shown by Hackman and Oldham to relate positively to a number of beneficial work outcomes, such as employee satisfaction, motivation, productivity, and attendance (1975:3). This score is computed as follows:

$$\text{Motivating Potential Score (MPS)} = \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Feedback}$$

From the formula it can be seen that a near-zero score of a job on either autonomy or feedback will reduce the overall MPS to near-zero, whereas a near-zero score on one of the other three job dimensions cannot cause this to happen. The instrument designed to measure these five job dimensions is the Job Diagnostic Survey (JDS). It not only measures these dimensions, but other concepts in the theory present in the Job Characteristic Model that was presented in Figure 1. The JDS will be discussed in the next chapter.

Summary

Much research has been done in the areas of job design and job satisfaction. It seems that job design started out without considering the human aspects of the job, but as turnover and absenteeism increased, the human side of the job was given increased attention. Now researchers are

looking at the interaction between the characteristics of the job itself and the needs of the worker and his characteristics. In this present research with the flight crew members of the 7th BMW, the writer will use Hackman and Oldham's Job Characteristic Model as the basic underlying theory with which to work. With the JDS as the basic measurement instrument along with the Hoppock measure of job satisfaction, flight crew member job satisfaction levels and factors affecting job satisfaction will be analyzed.

III. METHODOLOGY

The Questionnaire

The instrument used in this research is composed of the Short Form of the Job Diagnostic Survey (JDS), the Hoppock Measure of Job Satisfaction, a few questions on organizational climate, and a section of demographics. These different parts of the questionnaire will be discussed separately, along with the different methods used to collect and analyze the data.

The Job Diagnostic Survey (JDS)

The theory behind the JDS was discussed in Chapter II. The Job Characteristics Model of Hackman and Oldham is a synthesis of the theories of Lawrence and Turner, and Hackman and Lawler. Using this synthesis as their conceptual base, Hackman and Oldham designed the JDS as the instrument to measure the concepts put forth in their model. In developing and refining the JDS, they were guided by the following considerations (1974a:7,8):

> 1. They wanted to link the instrument closely to a specific theory of work design and work motivation. The JDS provides measures of all critical variables in the theory and it is useful primarily for examining the characteristics of jobs *per se* and employee reactions to those jobs.
>
> 2. To provide more than one methodological format for assessing the theory-specified variables, an attempt needed to be made to measure each variable in more than one way. Therefore, in the JDS, most of the variables are addressed in two different sections of the questionnaire in two different formats.

3. A clear distinction between description of the job *per se* and affective reactions to the job had to be maintained. The item formats and wordings in the JDS were developed to make the difference between those items which ask for a *description of the job itself*, and those that measure employees' personal and affective *reactions* to the job as clear as possible.

In refining the JDS, the instrument was administered to over 1500 individuals working on more than 100 different jobs in about 15 organizations. Two forms of the JDS were developed, the JDS itself and a shorter, more brief form. The latter form is the version used in this research. It takes less time to complete, but it still measures everything that the JDS measures except the three psychological states.

Description of the Short Form of the JDS

The first five sections of the questionnaire used in this research contain the Short Form of the JDS. It measures several characteristics of the job, the reactions of the respondents to their jobs, and the growth need strength of the respondents. All of the scales used to measure the different variables are seven-point scales, except for the one used to measure individual growth need strength, which is a four-to-ten point scale. The questionnaire itself is in Appendix A, while the scoring key for the Short Form of the JDS is in Appendix B. Each variable score is an average of the items that measure that variable.

The first two sections of the Short Form of the JDS measure the five core dimensions defined in Chapter II plus two additional dimensions. The two dimensions, feedback

from agents, and dealing with others, are defined as follows (Hackman and Oldham, 1974a:72):

> Feedback from agents. The degree to which the employee receives information about his or her performance effectiveness from supervisors or from co-workers.
>
> Dealing with others. The degree to which the job requires the employee to work closely with other people.

These seven dimensions are objective characteristics of the job itself.

Sections Three and Four of the questionnaire contain items that measure an individual's affective responses to the job. These variables are the private, affective reactions or feelings that an employee gets from working on his job. The first two variables are measured in Section III and are defined as follows (Hackman and Oldham, 1974a:72,73):

> General Satisfaction. An overall measure of the degree to which the employee is satisfied and happy in his or her work.
>
> Internal Work Motivation. The degree to which the employee is self-motivated to perform effectively on the jobs.

Five specific satisfactions with the job are measured in Section Four. Short scales tap specific aspects of the employee's job satisfaction. These variables are:

1. "Pay" satisfaction.
2. "Security" satisfaction.
3. "Social" satisfaction. How an individual is satisfied with the people he or she works with and how they are satisfied with the chance to help other people.
4. "Supervisory" satisfaction. The overall quality of the supervision received in a person's job.
5. "Growth" satisfaction. This variable pertains to the amount of personal growth and development

that an individual gets from his or her job, the amount of job challenge, independent thought and action in the job, and the amount of worthwhile accomplishment felt by the individual in doing the job.

The last variable measured by the Short Form of the JDS is measured in Section Five. This variable, individual growth need strength, is the degree to which an employee wants to obtain "growth" satisfaction from his or her work.

As a final overall score that reflects the potential of a job to elicit high internal work motivation on the part of employees, a summary index called the Motivating Potential Score (MPS) can be calculated. As shown in Chapter II, the MPS is computed as follows:

$$MPS = \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Feedback}$$

In summary, the Short Form of the JDS measures 16 different variables. These variables are listed as follows with the number of questions pertaining to each variable in parentheses:

1. Skill Variety (3)
2. Task Identity (3)
3. Task Significance (3)
4. Autonomy (3)
5. Feedback from the Job Itself (3)
6. Feedback from Agents (3)
7. Dealing with Others (3)
8. General Satisfaction (3)
9. Internal Work Motivation (4)
10. Pay Satisfaction (2)
11. Security Satisfaction (2)
12. Social Satisfaction (3)
13. Supervisory Satisfaction (3)
14. Growth Satisfaction (4)
15. Individual Growth Need Strength (6)
16. Motivating Potential Score

Validity of the JDS

In their report on the development of the JDS, Hackman and Oldham discussed in detail the validity of their instrument (1974a:17-28). The results in this report are based on data collected from 658 employees working on 62 different jobs in seven organizations. In looking at the internal consistency reliabilities of each of the scales measured by the JDS, the median inter-item correlation for all items which are scored on each scale was obtained. These correlations were then adjusted by Spearman-Brown procedures to obtain an estimate of the reliability of the summary scale score (1974a:39). These reliabilities ranged from a high of .88 (growth need strength) to a low of .56 ("social" satisfaction).

To test the discriminant validity of the items measured by the JDS, median off-diagonal correlations between the item composing a given scale and all of the other items which are scored on different scales of the same general type were computed. These median off-diagonal correlations range from .12 (task identity) to .28 ("growth" satisfaction) and show that the JDS is able to discriminate between the different items being measured. Hackman and Oldham were generally satisfied with these results showing the internal reliability of the scales and the discriminant validity of the items. The results obtained from this data base of 658 employees are found in Appendix C. These tables include the means and variances of the 658 respondents,

the results of one-way analysis of variance, and the intercorrelations across all 658 respondents and across the 62 jobs.

Hackman and Oldham found that the job dimensions themselves were moderately intercorrelated but they said that "there is no a priori reason to expect that the job dimensions would or should be completely independent, and a moderate level of intercorrelation among them does not detract from their usefulness as separate job dimensions. This fact of non-independence should be recognized and accounted for in interpreting the scores of jobs on a given job dimension" (1974a:26). In general, the relationships among the JDS scales and behaviorally-based dependent variables were found to be in the direction predicted by the theory on which the instrument is based.

Hoppock Measure of Job Satisfaction

Section Six of the questionnaire contains the four questions that compose the Hoppock Measure of Job Satisfaction. These four questions are concerned with the individual's impressions of his job. They pertain to:

> How well he likes his job.
> How much of the time he is satisfied with his job.
> How willing he would be to change his job.
> How he thinks his feelings about his job compare with the feelings of other people about their jobs (Bolyard, 1976:15).

The Hoppock measure is scored by taking the sum of the responses to the four questions. The overall score ranges from 4 to 28, with the lower score indicating dissatisfaction and the higher score indicating an overall satisfaction with

the job. This measure has been in use for over forty years and has been validated previously (Manley, et al., 1976). The four questions used in this research contain minor changes which adapt them to the military. These changes are assumed to leave unchanged the effectiveness of this measure of job satisfaction.

Organizational Climate

The last 13 questions of Section Two and the last three questions of Section Three pertain to the organizational climate of the organization, communication within the organization, and the rewards of the organization. These questions have not been validated at the time of this writing and will only be used as indicators of how the respondents perceived their organization. They were put into the survey to help another researcher collect a data base with which to validate the questions. These questions are measured on a seven-point scale.

Questions 15, 16, 18, 19, 21, 22, 23, 25, 26, and 27 of Section Two measure whether an organization is operating under one of two distinct types of systems of management, labeled "mechanistic" and "organic" by Burns and Stalker in 1961. Reversed scoring is applied to questions 18, 23, and 26 and then they are added to the other questions. A mean score is then calculated with the higher number indicating that the organization is more "organic" in nature while the lower number indicates that the organization is more "mechanistic." (Porter, et al., 1975:228,229).

The "mechanistic" type is characteristic of stable environments whereas the "organic" type denotes a changing environment. They are described as follows (Porter, et al., 1975:228,229):

> In mechanistic systems the problems and tasks facing the concern as a whole are broken down into specialisms. The technical methods, duties, and powers attached to each functional role are precisely defined. Interaction within management tends to be vertical, i.e., between superior and subordinate. Operations and working behavior are governed by instructions and decisions issued by superiors. The command hierarchy is maintained by the implicit assumption that all knowledge about the situation of the firm and its tasks is, or should be, available only to the head of the firm. Management, often visualized as the complex hierarchy familiar in organization charts, operates a simple control system, with information flowing up through a succession of filters, and decisions and instructions flowing downwards through a succession of amplifiers.
>
> Organic systems are adapted to unstable conditions, where problems and requirements for action arise which cannot be broken down and distributed among specialists' roles within a clearly defined hierarchy. Individuals have to perform their special tasks in the light of their knowledge of the tasks of the firm as a whole. Interaction runs laterally as much as vertically. Communication between people of different ranks tends to resemble lateral consultation rather than vertical command. Omniscience can no longer be imputed to the head of the concern.

How supervisors communicate with the members of the organization is indicated by questions 17, 20, and 24 (reversed scoring) of Section Two. A mean score is computed whereby good communication with supervisors is indicated by a higher number while a lower number would indicate lack of communication.

Rewards of the organization are measured by questions 8, 9, and 10 of Section Three. Reversed scoring is applied

to question 9 and 10, and then a mean is computed for all three questions. A higher number shows that rewards and recognition are given to an individual for his or her good work while a lower number indicates that one is not rewarded for his or her performance.

Demographics

Questions pertaining to the biographical background of each respondent were asked in Section Seven. These questions sought responses for the following information:

1. Rank
2. Age
3. Marital Status
4. Current Squadron Assignment
5. Time assigned to current squadron
6. Crew position
7. Type duty of respondent
8. Career intentions
9. Total Active Federal Military Service

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11. Source of Commission
12. Evaluation under new OER system
13. Last OER rating by reviewer
14. Second to last OER rating from reviewer

Sample Population

The sample population used in this research is composed of the four flying squadrons of the 7th BMW broken down in the different crew positions as mentioned in Chapter I. Also, some staff personnel who deal directly with the crews, such as squadron commanders and their staff, squadron instructors, and personnel from the Offensive and Defensive Systems offices were included. This SAC wing was chosen for this research because of the author's familiarity with the 7th BMW

and its people. Having been a member of the 20th BS and an instructor in the 4018 CCTS, the author became aware of some dissatisfaction, so this research was done to see if there in fact was dissatisfaction and to find out the reasons why.

The 7th BMW has compiled an outstanding record during its long history. With two bomb squadrons, the 9th BS and the 20th BS, it has a history dating back to 1919, making the 7th BMW the oldest active combat unit in SAC. The 7th BMW has proven itself with excellent results in different evaluations and inspections throughout the past years. The highlight of the past year was when the 7th BMW crews and personnel excelled in the SAC bombing and munitions competition held in September 1976, winning four major awards and dozens of individual trophies. For this excellent work, the 7th BMW earned the title, "Best of the Best," for overall outstanding results. In early 1977 after a change in wing commanders, a SAC Operations Readiness Inspection (ORI) hit the 7th BMW; the 7th BMW again performed in a outstanding manner. This is the overall atmosphere under which this research has been conducted.

Data Collection

During the week of 6-10 June 1977, the author went to Carswell AFB, Texas, to collect the data for this research. Questionnaires were handed out to each crew member available during the week either on their mission planning day or at the alert building. In the case of the 4018 CCTS academic teams, questionnaires were left at the different offices for

each crew specialty. Also, questionnaires were left behind for the crews that were on leave to be mailed to the researcher. To make sure that every possible potential respondent was contacted, the author used squadron rosters along with the weekly ground training and flying schedules to try to canvass as much of the total population as possible.

The purpose of the research and the questionnaire were explained to the majority of the subject population at the monthly Flying Safety Meeting held on the morning of 6 June, and to each respondent as the questionnaires were handed out. Each respondent was assured that the results of the individual questionnaires would be anonymous. The questionnaires were picked up at the end of the mission planning day or whenever finished during the week, with 245 useable surveys returned, for an overall response rate of 65 percent. A full response profile will be shown in Chapter IV.

Classification of Variables

Dependent Variable. The primary dependent variable in this research on the job satisfaction levels of the four flying squadrons and the different crew positions is the Hoppock Measure of Job Satisfaction. The variable that corresponds to the Hoppock measure in the JDS is the variable General Satisfaction. The three questions that make up this measure are very similar to the four questions of the Hoppock measure. These two measures were very highly correlated (.85). Since the Hoppock measure has been used extensively in surveys given to Air Force personnel such as

the Quality of Life Surveys, it will be used as the overall measure of job satisfaction.

Independent Variables. All the variables measured by the JDS excluding General Satisfaction, the overall Motivating Potential Score of the JDS, and all the demographic variables were used as independent variables. In essence, this work involved model searching for the best linear explanatory model of overall job satisfaction. The JDS variables are measured at the interval level as were some of the demographic variables such as age, time of service, and OER index. Other demographic variables, such as education level and career intentions measured at the ordinal level, were treated as being measured at the interval level.

Dummy variables were used to represent the remainder of the demographic variables. These variables are rank, broken down into officer and enlisted, current squadron assignment, crew position, and source of commission. These variables were thought to have a potential influence on job satisfaction. Dummy variables are used to show that an observation has or does not have a certain attribute. These variables are coded as one or zero and if an observation has that attribute, the dummy variable takes on the value of the number one. If the observation does not have that attribute, it takes on the value of zero. By using dummy variables as independent variables, a measure of the effect of a particular attribute (such as current squadron assignment) on the dependent variable job satisfaction can be achieved.

Data Analysis Methods

The data collected during the research was looked at first using the Statistical Package for the Social Sciences (SPSS) FREQUENCIES routine. This routine examines the distributional characteristics of each of the independent and dependent variables under study. Descriptive statistics calculated by FREQUENCIES include the mean, standard error, median, mode, standard deviation, variance, kurtosis, skewness, range, and the minimum and maximum (Nie, et al., 1975: 194-202). Histograms of the Hoppock Measure of Job Satisfaction were plotted for the overall sample population, each squadron, and each crew position to check if the total population and the different groups approximated a normal distribution, which they did. The routine was also used to check the coding and punching onto computer cards of the raw data.

The SPSS routine CROSSTABS (crosstabulation) was used to see how strongly two variables are related to each other. For example, in this research the author was interested in seeing how the two variables, crew position and OER, were related. By using this routine the joint frequency distributions of the cases can be statistically analyzed by certain tests of significance, such as the Chi-square statistic, to determine if the variables are statistically independent. Different measures of association such as contingency coefficient, phi, tau, and gamma are calculated by the CROSSTABS routine. These measures describe the degree to which the values of one variable predict or vary with those of another

(Nie, et al., 1975:218-247).

After the total population was broken down into the four flying squadrons and the different crew positions, the SPSS subprogram T-TEST was run. This routine was used to determine if the levels of job satisfaction and the other variables measured were significantly different between the different groups. The subprogram provided the capability to compute the Student's t and probability levels for testing whether or not the difference between two sample means of the same variable were significant (Nie, et al., 1975: 267-275).

Another SPSS subprogram used to determine which variables are associated with each other and which presumably influence the dependent or criterion variable, the Hoppock Measure of Job Satisfaction, was the routine PEARSON CORR (Pearson correlation). Pearson correlations are a measure of association which measures the strength of the linear relationship between two variables. This relationship is denoted by the letter r. The value of r can range from -1 to +1, with a value of -1 showing perfect negative correlation and a value of +1 perfect positive correlation. A value of zero denotes no correlation between the variables. Whether the correlation is negative or positive indicates the direction of the relationship only. For example, if the correlation is positive, both variables move in the same direction and in the opposite direction for negative correlation.

In determining the factors affecting job satisfaction

levels among the four squadrons and the different crew positions, the statistical technique of multiple regression was used. This technique analyzes the relationship between the dependent variable and a set of independent or predictor variables (Nie et al., 1975:321). The linear model resulting from this type of analysis is shown as follows:

$$Y^1 = A + B_1X_1 + B_2X_2 \ldots B_iX_i + e$$

where Y^1 is the estimated value of the dependent variable Y, B_i's are the constants by which all values of the independent variables X_i's are multiplied, and A is a constant added to each case. The letter e is called the residual or "the difference between what is actually observed and what is predicted by the regression equation--that is, the amount which the regression equation has not been able to explain" (Draper and Smith, 1968:86).

When trying to explain a dependent variable in terms of independent variables which might not use the same units of measure, beta weights are used. These weights are standardized regression coefficients and their relationship to unstandardized regression coefficients is as follows:

$$\underline{B}_{yx} = B_{yx} \frac{S_x}{S_y}$$

where $\underline{B}_{yx}$ is the beta weight, B_{yx} the regression coefficient, and S_x and S_y are the standard deviations of x and y, respectively.

Another very useful statistic as an output from the SPSS REGRESSION program is R^2. This statistic shows the

strength of the linear association of the dependent variable and the set of independent variables. R^2 is defined in the following manner:

$$R^2 = \frac{\text{variation in Y explained by the combined linear influence of the independent variables}}{\text{total variation in Y}}$$

It is a measure of the "proportion of variance in one variable explained by the other variables where variance is a measure of the variability or lack of homogeneity in a variable" (Nie, et al., 1975:279).

The specific method of regression used is stepwise regression. This procedure begins by selecting the independent variable that is most highly correlated with the dependent variable and brings it into the regression equation. Next, the partial correlations of the remaining variables are looked at and the one with the highest correlation is brought into the equation. This process is continued and, through the use of an "F" test, the variables already in the equation are examined to see if they are still significant. If not, they are removed from the equation (Draper and Smith, 1966: 171-172).

During the use of all these statistical methods, cases containing missing values were handled by the method of pairwise deletion. Under this method a case was deleted from a given computation when any of the variables involved was missing, but only for that particular computation.

Job Diagnostic Tools

To put Hackman and Oldham's theory into practice, a set

of job diagnostic tools can be used to evaluate jobs and peoples' reactions to them. These tools can pinpoint what aspects of specific jobs could be changed to make the job better and to make the personnel more satisfied with their jobs. It may be that after the diagnosis, problems on the job may be found to be "people problems" instead of problems of how the work is designed (Hackman et al., 1974b:7-10).

When a diagnosis of a job is conducted, one of the first things to look at is the psychological needs of people. In determining who can (and who cannot) become internally motivated at work, research has shown that the psychological needs of people need to be considered. People who are high in the JDS variable "growth need strength" have been found to have strong needs for personal accomplishment, for learning more and developing themselves, and for being stimulated and challenged. Those people are very responsive to jobs that are high on the five core dimensions. Those workers who do not have strong growth needs may respond less eagerly to those jobs. The proposition that "individual growth needs have the power to moderate the relationship between the characteristics of jobs and work outcomes," is shown in Figure 2 (Hackman, et al., 1974b:6).

In addition to looking at the growth need strength levels of the workers, another job diagnostic tool is the Motivating Potential Score (MPS). This score indicates the overall indication of the "motivating potential" of the existing job, and it also gives the scores on each of the

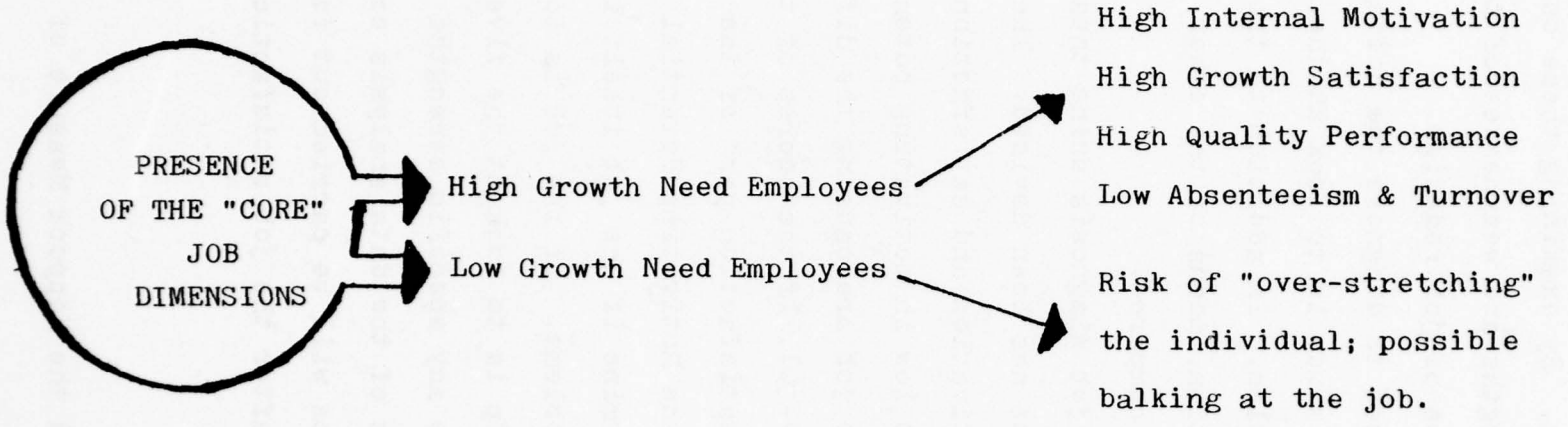

Figure 2. The Moderating Effect of Employee Growth Need Strength (Hackman, et al., 1974b:6a)

five core dimensions. By examining these core dimensions of the job the strengths and weaknesses of the job may be assessed for any type of job redesign.

Another tool used to diagnose the different jobs of the respondents in this study is to look at the means of the different JDS variables. In addition to the levels of motivation and satisfaction, means of the other aspects of the work setting can be compared.

To carry out a job diagnosis using these tools, a sequence of questions has been devised. The questions to ask are, "Are motivation and satisfaction central to the problem? Is the job low in motivating potential? What specific aspects of the job are causing the difficulty?" (Hackman, et al., 1974b:9-10). If the scores of the workers on the motivation and satisfaction part of the JDS are found to be problematic, the Motivating Potential Score needs to be examined to determine if the job itself is the cause of any motivational problems. If the job is low on the MPS, the next or last step is to look at the five core dimensions and see if there are any specific strengths and weaknesses of the job. As part of the data analysis conducted in this research, these steps will be carried out for the squadrons and crew positions after the job satisfaction levels have been examined.

Assumptions

1. The JDS and the Hoppock Measure of Job Satisfaction

are valid.

2. The sample population follows a normal distribution.

3. The responses to the survey are valid.

4. The data used in this research have the characteristics of interval level data.

Limitations

1. The survey method itself is a limitation in that only the information asked will be given.

2. Since each respondent was guaranteed anonymity, there is no possibility of follow-up of the survey.

Summary

In summary, the questionnaires were handed out during the week of 6-10 June 1977 to the members of the four flying squadrons of the 7th BMW plus some staff personnel. After the data was collected, coded, and punched onto computer cards, the SPSS subprograms FREQUENCIES, CROSSTABS, T-TEST, PEARSON CORR, and REGRESSION were used to analyze the data. In the following chapter, the results are used to look at the job satisfaction levels and the factors influencing job satisfaction for the total population, the four squadrons, and for the different crew positions. Also, the Motivating Potential Score and the other variables from the JDS will be used to diagnose the job.

IV. DATA ANALYSIS RESULTS

Presentation of Results

This chapter presents the findings of the analysis of the data collected from 7th BMW personnel. The chapter will be divided into two sections. Section I will contain findings relevant to the total sample population plus the four flying squadrons. A profile of the response to the questionnaire, the results of the different statistical analyses, and a diagnostic discussion of the job will be included in the first section. The second section will deal with the different crew positions, incorporating the same discussions as outlined for the sample population and the squadrons above.

SECTION I

Response Profile

The approximate populations of the sample population, the four squadrons and staff personnel surveyed, plus the number of surveys received is presented in Table I. The main reason for the difference in the total population that could have been surveyed and the number of surveys handed out to each group is that a number of spare crew members were not available during mission planning days or on alert. Out of the 374 questionnaires handed out, 15, or four percent, were returned incomplete and were not used. Questionnaires that were returned with only one or two missing biographical answers were not thrown out because the data contained in them was still pertinent for the research.

Table I
Questionnaire Response

Groups	Approximate Population	Number Surveys Distributed	Percent of Population Surveyed	Number Useable Surveys	Percent Useable
7th ARS	82	73	89%	31	42%
9th BS	132	111	84%	78	70%
20th BS	137	110	80%	72	65%
4018th CCTS	78	66	85%	53	80%
7th BMW (Staff)	14	14	100%	11	79%
Total	443	374	84%	245	65%

Demographic Data of the Sample Population

The breakdown of the sample population is shown through selected demographics in Table II. The SPSS FREQUENCIES subprogram provided the data. For further breakdown of the demographics for the sample population and the squadrons, refer to Appendix D.

Means of the 16 variables measured by the JDS, the organizational climate questions, the Hoppock Measure of Job Satisfaction, and selected biographical questions for the total sample population and the four squadrons are shown in Table III. The scales used to measure all of the JDS variables, excluding individual growth need strength (four-to-ten) and the MPS (calculated from the five core dimensions), plus the organizational questions, are seven-point Likert scales. The scores from the Hoppock measure range from 4 to 28.

Different scales were used to measure the demographic

Table II
Biographical Data of Sample Population

	N	Percent
Rank		
Enlisted	41	16.7%
Officer	204	83.3%
Squadron Assignment		
7th ARS	31	12.7%
20th BS	72	29.4%
9th BS	78	31.8%
4018 CCTS	53	21.6%
7th BMW (Staff)	11	4.5%
Crew Position		
Pilot	50	20.6%
Co-pilot	31	12.8%
Radar Navigator	43	17.7%
Navigator	31	12.8%
Electronic Warfare Officer	47	19.3%
Gunner	33	13.6%
Boom Operator	8	3.3%
Type Duty		
Regular Crew Member	120	49.0%
Instructor	67	27.3%
Standboard	37	15.1%
Academic Instructor	21	8.6%
Education Level		
High School	10	4.1%
Some College	38	15.5%
College Degree	81	33.1%
Some Graduate Work	79	32.2%
Master's Degree	35	14.3%
Work Beyond Master's	2	.8%
Age		
Under 20	3	1.3%
20-29	121	50.6%
30-39	94	31.3%
40-49	21	8.8%

variables. Career Intention is measured on a five-point scale with the higher number indicating definite Air Force career intentions. Education level is measured on an eight-point scale with the lower end being high school graduate to having a doctorate degree for the upper end. Four

Table III
Variable Means by Total Population and Squadrons

	Population N=245 Mean	7th ARS N=31 Mean	9th BS N=78 Mean	20th BS N=72 Mean	4018 CCTS N=53 Mean	7 BMW N=11 Mean
1. SKILL VARIETY	4.75	5.03	4.27	4.63	5.39**	5.09
2. TASK IDENTITY	4.89	5.12	4.65	4.64	5.33*	5.54**
3. TASK SIGNIFICANCE	5.43	5.58	5.09	5.23	6.09**	5.54
4. AUTONOMY	4.29	4.00	3.83	3.84	5.45*	5.70**
5. FEEDBACK FROM JOB	4.99	5.37	4.63	4.90	5.42**	4.91
6. FEEDBACK FROM AGENTS	4.51	4.85*	4.37	4.25	4.79	4.97**
7. DEALING WITH OTHERS	6.25	6.20	6.18	6.17	6.48**	6.27
8. GENERAL SATISFACTION	4.72	4.62	4.36	4.53	5.47**	5.21
9. PAY SATISFACTION	5.74	4.76*	4.19	4.43	4.38	5.32**
10. INTERNAL MOTIVATION	4.42	5.50	5.52	5.64	6.23*	6.25**
11. SECURITY SATISFACTION	3.51	3.81	3.38	3.07	3.89*	4.73**
12. SOCIAL SATISFACTION	5.28	5.19	5.05	4.89	6.01*	6.12**
13. SUPERVISORY SATISFACTION	4.78	5.12*	4.65	4.44	5.09	5.48**
14. GROWTH SATISFACTION	4.43	4.52	4.01	4.00	5.43**	5.20
15. INDIVIDUAL GROWTH NEED STRENGTH	6.09	5.73	6.15*	6.09	6.09	6.61**
16. MOTIVATING POTENTIAL SCORE	118.26	118.42	93.25	98.93	172.39**	160.78
17. HOPPOCK MEASURE JOB SATISFACTION	18.16	18.35	16.92	17.51	20.49**	19.36
18. AGE	30.25	28.07	28.37	28.60	35.38**	35.27
19. EDUCATIONAL LEVEL	4.40	4.13	4.56*	4.36	4.21	5.09**
20. FEDERAL MILITARY SERVICE	8.69	6.87	6.80	6.40	14.53**	13.73
21. ORGANIZATIONAL CLIMATE	3.78	3.94	3.49	3.34	4.54*	4.60**
22. COMMUNICATIONS	4.88	5.17*	4.71	4.65	5.17	5.20**
23. REWARDS OF ORGANIZATION	3.25	3.60	2.81	3.03	3.91**	3.60
24. CAREER INTENTIONS	3.90	3.71	3.68	4.36	4.60*	4.80**
25. OER INDEX	2.37	2.40	2.34	2.41	2.38	2.27**

Note: The mean for OER Index indicates that the lowest number is the best rating.

** Highest mean score among all the groups.

* Highest mean score among the four flying squadrons in addition to **.

ratings were used to compose the OER index. The rating of the reviewer was asked for, with the answers being 1, 2, 3, and 4 or below. The closer the mean score is to 1 under the OER system, the better the rating.

Norms for the JDS measures have not been set but a comparison with other studies can be shown. The results of the Hackman and Oldham study are found in Appendix C, while the results of two other studies will be presented in Tables IV and V.

The results of a study conducted by Van Maanen and Katz among 3000 public employees, broken down into eight Equal Employment Opportunity Commission (EEOC) job categories, are presented in Table IV. Table V contains the JDS means of a recent Air Force study among 13 Systems Program Offices (SPO) at Wright-Patterson Air Force Base, Ohio. In this study, Rigsbee and Roof divided the SPO's into three categories according to stages of the weapons systems acquisition process (1975:44).

The mean Motivating Potential Score (MPS) for the three studies are higher than the mean of 118 for the sample population used in this research. The squadron MPS means ranged from a low of 93 for the 9th BS to a high of 172 for the 4018 CCTS. The MPS means from the Van Maanen and Katz study range from 115 to 178 whereas the range for the Rigsbee and Roof study range from 142 to 171. These means are only indicators of how groups in different, but somewhat similar jobs, scored. Four of the jobs measured in the Van Maanen

Table IV

Means of Job Dimensions by Equal Employment Opportunity Commission (EEOC) Categories

JOB DIMENSION	Overall Sample	EEOC JOB CATEGORIES: Administrators	Professionals	Technicians	Protective Services	Paraprofessionals	Office, Clerical	Skilled craft	Maintenance, Service
Skill Variety	5.18	5.98	5.84	5.33	5.83	5.05	4.47	5.06	4.23
Task Identity	5.09	5.42	5.30	5.18	4.58	5.11	4.89	5.15	5.12
Task Significance	6.06	6.26	6.22	5.94	6.43	6.20	5.90	5.78	5.87
Autonomy	5.04	5.60	5.50	5.20	4.97	4.89	4.75	4.85	4.59
Feedback from job	5.12	5.39	5.25	5.22	4.92	4.83	5.13	5.14	4.92
Feedback from agents	4.01	4.58	4.31	3.80	4.07	4.02	3.90	3.68	3.70
Dealing with others	5.68	6.29	6.05	5.70	6.13	5.95	5.36	5.09	5.14
Experienced meaningfulness of work	5.68	6.08	5.86	5.69	5.95	5.46	5.47	5.50	5.36
Experienced responsibility for work	5.67	6.10	5.89	5.63	5.52	5.52	5.73	5.42	5.34
Knowledge of results	5.40	5.52	5.32	5.46	5.21	5.06	5.53	5.48	5.40
Internal work motivation	5.64	5.96	5.86	5.66	5.68	5.48	5.62	5.42	5.33
Motivating potential score (MPS)	140	178	167	149	137	129	124	133	115
N	3059	368	477	380	352	159	582	287	427

(Hackman and Oldham, 1974a:84)

Table V
Means of Satisfaction Concepts by Category

Satisfaction Concepts	Category I	Category II	Category III
Skill Variety	6.27*	5.63	5.68
Task Identity	5.58*	4.69	4.82
Task Significance	4.86	5.33	5.43*
Autonomy	5.85*	5.28	5.51
Feedback from Job	5.12*	4.89	5.07
Feedback from Agents	4.68	4.21	4.73*
Dealing with Others	6.88*	6.62	6.62
General Satisfaction	5.82*	5.35	5.27
Internal Motivation	5.86	5.98*	5.88
Pay Satisfaction	5.84*	5.50	5.58
Security Satisfaction	5.75*	5.23	5.32
Social Satisfaction	5.85*	5.41	5.60
Supervisory Satisfaction	5.75*	5.70	5.61
Growth Satisfaction	5.62*	5.10	5.33
Growth Need Strength	6.10	6.12*	6.04
Motivating Potential Score	171.42*	141.97	160.78

*Highest average score among categories
(Rigsbee and Roof, 1975:44)

and Katz study seem to be comparable with the type jobs that crew members fulfill. These four categories are the administrators, professionals, technicians, and skilled craft. Definitions of these four categories plus the other categories surveyed can be found in Appendix E.

As a comparison for the Hoppock Measure of Job Satisfaction scores, means taken from the most recent Air Force Quality of Life Survey (1977) are presented in Table VI. The means are extracted from a study being conducted by an AFIT student dealing with the job satisfaction of first-term Air Force personnel. The sample population being studied contains rated personnel with up to six years of services and the other personnel with up to four years of service (Patterson, 1977).

Table VI
Hoppock Job Satisfaction Levels of First Termers

	N	Mean	Standard Dev.
Overall Population	2877	17.1	4.8
Enlisted	1771	16.9	4.84
Officers	1100	18.6	4.14
Rated	382	18.9	3.66
Non-rated	718	18.4	4.45

Comparable groups for this present research are presented in Table VII. For this sample population, the overall mean and the one for the enlisted personnel are higher than in the Air Force Quality of Life Survey, whereas the mean for officers (rated) is lower. Also the mean Hoppock scores for

the squadrons are listed in Table VII. These means range from a low of 16.9 for the 9th BS to a high of 20.5 for the 4018 CCTS.

Table VII
Hoppock Job Satisfaction Levels of the 7th BMW

	N	Mean	Standard Dev.
Overall Population	245	18.2	4.64
Enlisted			
Gunners	33	18.7	4.97
Boom Operators	8	20.6	4.72
Officers (Rated)	203	17.9	4.57
7th ARS	31	18.4	5.34
9th BS	78	16.9	4.70
20th BS	72	17.5	4.40
4018 CCTS	53	20.5	3.56
7th BMW (Staff)	11	19.4	4.61

Other JDS and demographic means from Table III can be compared among the groups pictured there. Overall, the members of the 7th BMW staff who were surveyed were highest on 14 of the variables. These higher scores would be expected because of the type jobs these personnel have. As a staff member, they interact with top supervisors in the wing and thus perceive their job to be more in the spotlight than if they were crew members. They seem to perceive their job as having a visible outcome and one in which they have more freedom to schedule and determine how they are to carry out their work. Also, since they work closely with other staff members and their supervisors, they receive immediate feedback from their supervisors. This job gives them added security satisfaction

because they have advanced from being on a crew to being a staff member.

Since they are more visible in these jobs, they have received better OER ratings than the rest of the sample population. These findings are further validated by looking at their higher scores on pay, social, and supervisory satisfaction. Their general satisfaction and the Hoppock measure (17) are also high. They are also the highest in growth need strength and high on the MPS, indicating high scores on the five core dimensions. According to the Job Characteristic Model, "growth need strength is postulated to moderate how people react to complex, challenging work at two points in the model, as a link between the objective job dimension and the psychological states, and again between the psychological states and the outcome variables" (Hackman and Suttle, 1977: 131,132). All these findings go along with the model which says that "responses to jobs high in objective motivating potential are more positive for people who have strong needs for growth than for people with weak growth needs" (Hackman and Suttle, 1977:132). Also, the model predicts that people who work on jobs high on the core job characteristics are more motivated, satisfied, and productive than are people who work on jobs that score low on these characteristics (Hackman and Suttle, 1977:132).

This group perceived that their organization was more "organic" than the others, showing that they had more freedom of structure in a staff position. They also had a higher mean score for rewards of the organization and they were

higher on the variable Career Intentions. All these findings once again reflect the nature of these jobs.

Since the 7th BMW staff personnel only represent a small percentage (4.5 percent) of the total sample population, it will not be dealt with further as a separate group. The remainder of Section I will look at the factors affecting job satisfaction of the sample population and the job satisfaction levels and factors affecting it for the four flying squadrons.

Analysis of the Four Flying Squadrons

After looking at the small 7th BMW staff group, the 4018 CCTS has the highest mean scores for 18 of the variables presented in Table III. First of all, its mean scores are higher on all of the core dimensions as indicated by its high Motivating Potential Score of 172. In this category, the 9th BS has the lowest MPS of 93. The 9th BS also scored the lowest on the Hoppock Measure of Job Satisfaction (16.9), while the 4018 CCTS had the highest mean score of 20.5.

All four of the squadrons scored about the same on the variable Growth Need Strength with the 9th BS being higher. This need for growth is further evidenced by their higher mean score on the demographic variable Education Level. Sixty percent of the personnel surveyed from the 9th BS have done some graduate work or have their Master's degrees, in comparison with 40.3 percent for the 20th BS, 41.6 percent for the 4018 CCTS, and 35.5 for the 7th ARS. This implies that these particular members of the 9th BS may not be receiving

their "growth" satisfaction or need for personal growth and development from their job, so they are seeking it in advanced education. The 9th BS came out with the best overall OER rating.

The 7th ARS has higher mean scores on the related variables Feedback from Agents, Supervisory Satisfaction, and Communications. The implications here are that the feedback channel from the supervisors to the crew members is more open than for the other squadrons. This squadron also has the highest mean score for "pay" satisfaction.

The 4018 CCTS had overall higher scores in all of the JDS variables measuring one's affective reactions to the job. Also, the 4018 CCTS leans more toward being an "organic" organization as indicated by its 4.5 mean score. The nature of this squadron, with its instructor-student relationship, condones less structure than in the other squadrons. The variable, Rewards of the Organization, was higher for this group as was Career Intentions. All of these higher scores could be moderated by the fact that these respondents were older (35 years old compared to 28 for the other three squadrons) and had been in the service longer (14 years versus 6-7 years).

To see if the differences between the job satisfaction levels and the factors affecting them are significant, t-test will be used later in this section. Correlation analysis of the sample population and the four squadrons will be next.

Correlation Analysis

Correlation matrices for the total sample population and the four squadrons are presented in Tables VIII-XII. These tables show the strength of the association between the dependent variable (Hoppock Measure of Job Satisfaction), the JDS variables including the MPS, plus the demographic variables age, OER index, and career intentions. To be able to put all the correlations on one page, the following key is used for these tables, plus the correlation tables in Section II of this chapter.

Key for Correlation Matrices

1. Skill Variety = SKILL
2. Task Identity = TASKID
3. Task Significance = TASKSIG
4. Autonomy = AUTO
5. Feedback from the Job = FEEDJOB
6. Feedback from Agents = FEEDSUP
7. Dealing with Others = ASSOC
8. General Satisfaction = GENSAT
9. Pay Satisfaction = PAYSAT
10. Internal Motivation = INTMOV
11. Security Satisfaction = SECSAT
12. Social Satisfaction = SOCSAT
13. Supervisory Satisfaction = SUPSAT
14. Growth Satisfaction = GWTHSAT
15. Individual Growth Need Strength = INDGWTH
16. Motivating Potential Score = MPS
17. Hoppock Measure of Job Satisfaction = HO
18. Age = AGE
19. OER Index = OER INDEX
20. Career Intentions = CARINT

Table VIII
Correlation Matrix for Total Sample Population (N=245)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	31																		
3. TASKSIG	53	33																	
4. AUTO	46	43	45																
5. FEEDJOB	39	37	54	38															
6. FEEDSUP	36	15	46	33	51														
7. ASSOC	38	14	45	26	41	41													
8. GENSAT	52	33	60	56	38	49	43												
9. PAYSAT	22	13	05	17	20	06	14	18											
10. INTMOV	28	26	45	38	31	35	37	58	19										
11. SECSAT	22	22	33	37	27	37	23	41	29	18									
12. SOCSAT	47	32	46	54	37	35	39	58	32	47	40								
13. SUPSAT	28	19	42	40	36	63	35	47	14	33	48	46							
14. GWTHSAT	61	38	65	69	47	51	43	78	26	63	46	71	54						
15. INDGWTH	02	-00	-01	-02	05	06	02	01	-02	14	02	11	-02	01					
16. MPS	61	58	62	85	69	46	35	59	19	44	40	55	43	70	04				
17. HO	52	32	58	55	36	43	45	85	19	61	40	60	49	81	-01	57			
18. AGE	28	19	26	32	13	08	10	25	09	18	17	29	07	27	-00	36	23		
19. OER INDEX	-14	-10	17	-08	01	-18	-17	-11	01	-13	-27	-06	-17	-15	-10	-09	-13	06	
20. CARINT	35	27	37	45	16	21	25	57	18	41	27	40	33	52	-05	40	57	47	-07

Note: 1. Decimals are omitted.
2. r = .1051 for p = .05
3. r = .1492 for p = .01

Table IX
Correlation Matrix for 7th ARS (N=31)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	SKILL	--																		
2.	TASKID	00																		
3.	TASKSIG	36	40																	
4.	AUTO	35	37	39																
5.	FEEDJOB	22	15	53	10															
6.	FEEDSUP	19	25	25	08	52														
7.	ASSOC	08	04	48	24	48	23													
8.	GENSAT	52	16	46	65	18	30	13												
9.	PAYSAT	17	00	-02	06	-00	-06	-05	11											
10.	INTMOV	50	15	54	38	31	11	46	58	23										
11.	SECSAT	08	35	28	26	03	-21	-10	27	26	07									
12.	SOCSAT	41	40	39	60	-11	-11	-14	14	29	43	38								
13.	SUPSAT	22	36	29	49	10	42	-05	61	16	29	25	44							
14.	GWTHSAT	55	41	72	74	37	29	25	83	10	59	38	69	64						
15.	INDGWTH	-01	24	22	-13	16	11	04	-17	36	14	07	23	06	-01					
16.	MPS	47	53	67	81	58	29	34	63	03	50	29	55	47	83	14				
17.	HO	43	26	52	67	13	11	18	85	06	72	09	69	53	81	-08	62			
18.	AGE	21	21	14	-03	-06	05	-08	03	08	-09	08	12	26	12	09	02	-07		
19.	OER INDEX	09	-20	-09	09	13	13	15	21	-15	-12	-46	-15	08	09	-47	01	18	30	
20.	CARINT	46	22	30	41	-12	-03	-03	62	-04	31	-02	54	22	51	-06	34	61	39	19

Note: 1. Decimals are omitted.
2. r = .3031 for p = .05
3. r = .4146 for p = .01

Table X
Correlation Matrix for 9th BS (N=78)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.	SKILL	--																		
2.	TASKID	33																		
3.	TASKSIG	55	37																	
4.	AUTO	48	37	44																
5.	FEEDJOB	39	43	59	42															
6.	FEEDSUP	43	28	53	35	56														
7.	ASSOC	53	18	44	21	54	39													
8.	GENSAT	60	34	61	46	41	63	52												
9.	PAYSAT	37	20	32	13	16	05	24	17											
10.	INTMOV	48	27	46	24	29	43	36	57	29										
11.	SECSAT	31	26	41	36	37	48	19	47	20	20									
12.	SOCSAT	56	29	48	41	42	48	53	55	40	46	43								
13.	SUPSAT	37	23	58	52	54	67	35	63	06	40	57	48							
14.	GWTHSAT	65	31	62	60	46	63	49	79	25	61	47	67	66						
15.	INDGWTH	01	-02	-03	-01	08	19	10	08	-04	13	10	07	-00	07					
16.	MPS	63	56	65	82	71	52	35	55	18	36	43	47	60	62	10				
17.	HO	58	28	56	44	38	55	52	87	22	55	44	57	60	81	-02	50			
18.	AGE	13	16	13	08	02	-03	10	18	22	04	01	08	03	09	02	08	21		
19.	OER INDEX	-26	-09	-37	-09	-21	-25	-19	-31	01	-18	-34	-23	-35	-30	-11	-22	-27	03	
20.	CARINT	31	36	46	38	24	31	27	58	20	35	23	27	47	50	-06	35	60	36	-19

Note: 1. Decimals are omitted
2. r = .2108 for p = .05
3. r = .3001 for p = .01

Table XI
Correlation Matrix for 20th BS (N=72)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	21																		
3. TASKSIG	46	31																	
4. AUTO	28	42	30																
5. FEEDJOB	26	42	44	30															
6. FEEDSUP	21	12	37	30	38														
7. ASSOC	21	11	32	12	13	41													
8. GENSAT	37	46	57	58	37	42	33												
9. PAYSAT	20	21	09	37	26	05	07	28											
10. INTMOV	41	28	27	30	24	30	26	50	15										
11. SECSAT	09	28	27	41	14	37	34	52	25	24									
12. SOCSAT	23	30	27	40	36	26	26	44	38	36	31								
13. SUPSAT	18	19	29	33	25	66	51	43	19	31	47	46							
14. GWTHSAT	51	43	60	66	40	49	29	76	33	63	54	57	51						
15. INDGWTH	-02	-08	-18	-14	04	-13	-13	-17	-08	09	-12	08	-01	-12					
16. MPS	46	57	51	84	67	36	22	66	37	35	42	48	32	70	-07				
17. HO	41	38	50	52	26	37	37	84	21	55	53	43	50	76	-06	56			
18. AGE	14	01	08	15	06	-16	-11	09	02	06	-04	09	-21	08	-02	22	06		
19. OER INDEX	-19	-05	-10	-07	20	-26	-30	02	16	-07	-23	12	-18	-10	07	01	-04	-02	
20. CARINT	24	18	17	26	-02	04	24	53	28	42	29	21	18	39	-07	22	54	37	-09

Note: 1. Decimals are omitted
2. r = .1954 for p = .05
3. r = .2721 for p = .01

Table XII
Correlation Matrix for 4018 CCTS (N=53)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	31																		
3. TASKSIG	51	-06																	
4. AUTO	51	36	39																
5. FEEDJOB	40	11	41	43															
6. FEEDSUP	44	-09	51	31	53														
7. ASSOC	39	02	68	50	59	47													
8. GENSAT	30	-02	58	32	23	38	54												
9. PAYSAT	-12	-07	01	02	29	13	15	06											
10. INTMOV	36	-02	49	35	28	26	43	55	03										
11. SECSAT	10	-18	17	16	26	36	25	13	46	-16									
12. SOCSAT	34	01	55	31	42	27	56	59	19	31	27								
13. SUPSAT	22	-10	27	10	35	52	19	13	15	12	36	34							
14. GWTHSAT	43	09	54	56	46	41	65	64	23	50	24	81	28						
15. INDGWTH	18	-04	19	03	04	02	06	23	-11	16	-06	09	-16	09					
16. MPS	69	45	50	82	74	50	51	25	07	35	20	35	25	52	01				
17. HO	38	05	69	44	39	46	63	73	22	48	24	75	26	74	13	41			
18. AGE	27	-02	20	-08	-03	24	07	03	-01	-08	28	-13	05	-14	-24	08	-01		
19. OER INDEX	07	-11	06	-22	03	-11	-03	-17	-05	-15	-16	07	-10	-07	-21	-07	-04	13	
20. CARINT	23	-03	23	32	40	32	33	35	23	07	40	32	12	34	-13	38	29	30	17

Note: 1. Decimals are omitted
2. r = .2301 for p = .05
3. r = .3102 for p = .01

The correlation between the Hoppock Measure of Job Satisfaction and the JDS variable General Satisfaction is seen to be quite high for the sample population and for the separate squadrons (.73 to .87). Also, the correlations of these two variables were generally the same with the other variables, which further substantiates the author's reasons for using only one of these variables, the Hoppock measure, in further analysis.

The MPS and the Hoppock measure are moderately correlated, ranging from a low of .41 for the 4018 CCTS to .62 for the 7th ARS. The correlations with the other variables for these two variables are similar, with the MPS being highly correlated with the five core dimensions and the Hoppock measure highly correlated with the affective reactions to the jobs, as would be expected. The five core dimensions are moderately intercorrelated for the different groups, as found in other studies (Hackman and Lawler, 1971; Hackman and Oldham, 1974), with one notable exception--the dimension Task Identity for the 4018 CCTS. The dimension Autonomy had the highest correlation with the MPS (.81 to .84).

In looking at the correlations for the 4018 CCTS in Table XII, the variable Task Identity is significantly correlated with only three other variables, Skill (.31), Autonomy (.36), and MPS (.45). It is also surprising that this variable has practically no correlation with the Hoppock measure (.05). The definition of Task Identity is "the

degree to which the job requires completion of a whole and identifiable piece of work, that is, doing a job from beginning to end with a visible outcome" (Hackman and Suttle, 1977: 130). It seems to the author that taking a student and training him for a certain amount of time and preparing him for his next job would be an identifiable piece of work. This would seem to be highly associated with the satisfaction one received from his job. The other core dimensions for this group, especially Task Significance (.69), were moderately correlated with the Hoppock measure. This correlation would seem reasonable since Task Significance implies that the job has a great impact on the lives or work of other people, which is the relationship between an instructor and his students. In the same sense, Task Significance is more highly correlated with the variables, Dealing with Others and Social Satisfaction.

All of the groups showed a high correlation between the JDS variable Growth Satisfaction and the Hoppock measure. These correlations ranged from a low of .74 for the 4018 CCTS to a high of .91 for the 7th ARS and the 9th BS. These correlations are about the same as between Growth Satisfaction and General Satisfaction. From looking at the questions for these three variables, the author decided that the Growth Satisfaction variable is a measure of something different than job satisfaction. Growth Satisfaction is measuring the amount of personal growth and development, and job challenge that one perceives in the job, not whether he

likes or dislikes the job and would quit it if he could. This variable was also highly correlated with the MPS and the other JDS variables.

Of the three demographic variables in the correlation tables, Career Intentions is the only variable with very many significant correlations. With the exception of the 4018 CCTS, it correlated moderately high with the variables General Satisfaction, Growth Satisfaction, and the Hoppock measure. All correlations of the various variables with Career Intentions were fairly low for the 4018 CCTS. The highest correlations for OER index were -.46 with Security Satisfaction, and -.47 with Growth Need Strength for the 7th ARS. Given that the best OER rating is one, these negative correlations make sense.

Overall, this correlation analysis follows the same results as Hackman and Oldham found in their study in 1974. The job dimensions and affective reactions in this research are generally independent of Growth Need Strength, as in the former study. The correlations of the sample population and the four squadrons compare favorably with those found by Hackman and Oldham in that JDS variables relate to one another as predicted by the theory upon which the JDS is based. In specific terms, the job dimensions (and the MPS) relate positively with other variables measured by the JDS that are predicted to be affected by job characteristics, including General Satisfaction (and the Hoppock measure), Growth Satisfaction, and Internal Motivation.

Analysis of Job Satisfaction Levels by t-Test

The hypothesis that the job satisfaction levels and factors affecting job satisfaction were different among the four squadrons was tested using the SPSS subprogram T-TEST. The Student's t and probability levels for testing whether or not the difference between two sample means is significant are calculated. Each squadron was compared with the other three for the Hoppock Measure of Job Satisfaction, the JDS variables and the MPS, and certain demographic variables.

For this type of analysis it is assumed that if samples of size n are drawn from a normal population with mean u and variance p^2, the sample means are normally distributed with mean u and variance (σ^2/n). Given the four sample populations with means u_1, u_2, u_3, and u_4, the null hypothesis (H_0) that the author is trying to disprove or reject is:

$$H_0: \quad u_1 = u_2 = u_3 = u_4$$

This equation says that the means are equal. If the null hypothesis is rejected, the alternative (H_1) is accepted:

$$H_1: \quad u_1 \neq u_2 \neq u_3 \neq u_4$$

The 2-tailed level of significance chosen as the smallest probability that will be accepted as reasonable is .05. If any of these four populations have unequal variances, the Student's t cannot be computed, but an approximation to t can be calculated. An F test of sample variances is computed with the null hypothesis being $H_0: \sigma_1^2 = \sigma_2^2$, etc., and the alternative $H_1: \sigma_1^2 \neq \sigma_2^2$ with a chosen significance level

of .05. If the probability for F is greater than .05, H_0 is accepted and t based on a pooled-variance estimate is used. H_0 is rejected when F is less than or equal to .05 and t based on the separate variance estimate is used in the T-TEST subprogram (Nie, et al., 1975:267-270).

In testing for significant differences of job satisfaction and other factors, the 7th ARS will be compared with the other three squadrons first, and then the squadrons not already compared with each other will be examined. For the 7th ARS, no significant differences in the Hoppock Measure of Job Satisfaction level between it and the other three squadrons were found at the .05 level. But the mean difference between the 7th ARS and the 4018 CCTS is significant at the .053 level, so for all practical purposes, there is seemingly a difference of means here. The Hoppock measure means for the 9th BS and 20th BS were also significantly different with the 4018 CCTS. For these cases, the null hypothesis (H_0) that the means are equal is rejected, supporting this part of the research hypothesis. These differences and other significant differences in means of the four squadrons are presented in Table XIII.

Significant mean differences between the 7th ARS and the 9th BS were found in three areas, the JDS variable Skill Variety and Feedback from the Job, plus the demographic Education Level. Two areas between the 7th ARS and the 20th BS had significant mean differences. The two variables are Feedback from Agents and Supervisory Satisfaction. The 7th

Table XIII
Difference Between Means for Squadrons

Variable	7th ARS (N=31)	9th BS (N=78)	20th BS (N=72)	4018 CCTS (N=53)	Sign. Level
		Means			
Hoppock Measure of Job Satisfaction	18.35			20.5	.053*
		16.9		20.5	.000*
			17.5	20.5	.000
Skill Variety	5.03	4.27			.002*
		4.27		5.39	.000*
			4.63	5.39	.001
Task Identity		4.65		5.33	.005
			4.64	5.33	.004
Task Significance		5.09		6.09	
			5.23	6.09	.000*
Autonomy	4.00			5.45	.000
		3.83		5.45	.000
			3.84	5.45	.000
Feedback from Job	5.37	4.63			.008
		4.63		5.41	.000
			4.91	5.41	.021

*Separate Variance Estimates

Table XIII (continued)

Variable	7th ARS	9th BS	20th BS	4018 CCTS	Sign. Level
		Means			
Feedback from Agents	4.85		4.25		.048
			4.25	4.79	.041
Dealing With Others		6.18		6.49	.043*
			6.17	6.49	.032*
General Satisfaction	4.62			5.47	.006
		4.36		5.47	.000
			4.53	5.47	.000
Internal Motivation	5.50			6.23	.003*
		5.52		6.23	.043*
			5.64	6.23	.000*
Security Satisfaction			3.07	3.89	.017
Social Satisfaction	5.19			6.01	.000
		5.05		6.01	.000*
			5.19	6.01	.000
Supervisory Satisfaction	5.12		4.43		.014*
			4.43	5.09	.016

*Separate Variance Estimates

Table XIII (continued)

Variable	7th ARS	9th BS	20th BS	4018 CCTS	Sign. Level
		Means			
Growth Satisfaction	4.52			5.43	.005*
		4.01		5.43	.000*
			4.00	5.43	.000*
Motivating Potential Score	118.4			172.4	.001
		93.3		172.4	.000
			98.9	172.4	.000
Age	28.6			35.4	.000
		28.4		35.4	.000
			28.6	35.4	.000
Career Intentions	3.71			4.60	.001*
		3.68		4.60	.000*
			3.56	4.60	.000*
Years of Military Service	6.87			14.53	.000
		6.79		14.53	.000*
			6.40	14.53	.000
Education Level	4.13	4.56			.046

*Separate Variance Estimates

ARS had the highest mean score in these two areas among the four squadrons. This implies that the members of the 7th ARS are the most satisfied with their supervisors. One reason could be that people in the 7th ARS are receiving more information about their effectiveness from their supervisors than in the other squadrons.

No significant differences between the Hoppock Measure of Job Satisfaction or any other variable was found between the 9th and 20th Bomb Squadrons. This is not in accordance with the research hypothesis, and H_0 is accepted for these two squadrons. This would be a logical finding, since these two squadrons are structure the same way and their ground training, flying requirements, and alert requirements are the same. Since the two squadrons seem to be statistically identical, they will be treated as one group in the regression analysis.

The most significant mean differences between job satisfaction levels and other factors measured in the survey are between the three tactical squadrons--the 7th ARS, 9th BS, and 20th BS--and the 4018 CCTS. Whereas significant mean differences were found between the 4018 CCTS and the two bomb squadrons (the 9th BS and 20th BS) on all five core dimensions, only one was significantly different between the 7th ARS and the 4018 CCTS--that being the variable Autonomy. The 20th BS and 9th BS were also significantly different from the 4018 CCTS on another objective characteristic of the job, Dealing with Others, while the 20th BS was also

different on the dimension, Feedback from Agents.

Since differences were found in the mean differences for the JDS core dimensions for both the 9th and 20th BS with the 4018 CCTS, it follows that the MPS would be significantly different. It is also different between the 7th ARS and the 4018 CCTS.

In the area of the affective reactions, or feelings that a worker gets from his job, all three of the tactical squadrons had significant mean differences with the 4018 CCTS on the variables General Satisfaction, Internal Motivation, and Social and Growth Satisfaction. The 20th BS was also different from the 4018 CCTS on Security and Supervisory Satisfaction.

Since the 4018 CCTS is composed of personnel who are more experienced in their particular crew specialties and are older, significant differences were found between it and the other three squadrons in the demographic variables age, years of military service, and Career Intentions. Being older and more experienced, these people are more settled on a career in the Air Force than the younger crew members in the other squadrons.

In summary, differences in job satisfaction levels were only found to be significant between the three tactical squadrons and the 4018 CCTS. Very few differences were found between the three tactical squadrons, but major differences were found between these squadrons and the 4018 CCTS. Both bomb squadrons were different in all five core

dimensions. Along with the 7th ARS, the 9th BS and 20th BS had significant mean differences with the 4018 CCTS in many other variables, especially the affective reactions to the job and the demographic variables age, years of military service, and Career Intentions.

Regression Analysis

Multiple regression analysis was used as a final step in analyzing the job satisfaction levels and the factors affecting it for the four flying squadrons. This technique can show the relationship between the dependent variable (Hoppock Measure of Job Satisfaction) and a set of independent or predictor variables. For this analysis the independent variables were all the JDS variables excluding General Satisfaction, the MPS, and the demographics. Dummy variables were used for such demographic variables as crew position, rank, and source of commission. In using the stepwise regression method, those variables which maximize the amount of explained variance in the dependent variable are selected.

Tablex XIV-XVII show the results of the regression of the Hoppock Measure of Job Satisfaction for the entire sample population and the four squadrons. The tables contain only those variables that entered at better than the .05 significance level and also increased the amount of explained variance (R^2) by better than about 1 percent of the total variance. The tables also show the beta weights, the R^2 and the marginal change in R^2 for each variable entered into the

Table XIV
Job Satisfaction Regression (Total Sample Population N=245)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.646	.649	.649	338.8	.000
Career Intentions	.207	.682	.033	195.1	.000
Dealing with Others	.121	.694	.012	136.7	.000

Job Satisfaction = 2.170*+ 1.994 (Growth Satisfaction) + .795 (Career Intentions)
+ .648 (Dealing with Others)

*Significant at .131

Table XV
Job Satisfaction Regression (7th ARS N=31)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.114	.657	.657	36.3	.000
Internal Motivation	.376	.749	.092	26.8	.000
Career Intentions	.334	.801	.052	22.7	.000
Age	-.350	.847	.046	22.1	.000
OER Index	.273	.880	.033	22.1	.000
Social Satisfaction	.258	.911	.031	23.9	.000
Supervisory Satisfaction	.225	.937	.026	27.5	.000

Job Satisfaction = -5.108*+ .405 (Growth Satisfaction) + 1.714 (Internal Motivation)
+ 1.435 (Career Intentions) - .408 (Age) + 2.024 (OER Index)
+ 1.513 (Social Satisfaction) + 1.102 (Supervisory Satisfaction)

*Significant at .496

Table XVI
Job Satisfaction Regression (9th BS and 20th BS N=150)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.617	.623	.623	188.2	.000
Career Intentions	.254	.679	.056	119.4	.000
Dealing with Others	.139	.695	.016	85.0	.000

Job Satisfaction = 2.187*+ 1.900 (Growth Satisfaction) + .921 (Career Intentions)
+ .666 (Dealing with Others)

*Significant at .173

Table XVII
Job Satisfaction Regression (4018 CCTS N=53)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Social Satisfaction	.536	.556	.556	43.8	.000
Task Significance	.403	.665	.109	33.8	.000
OER Index	-.203	.706	.041	26.4	.000

Job Satisfaction = -1.856*+ 2.60 (Social Satisfaction) + 1.522 (Task Significance)
- 1.060 (OER Index)

*Significant at .545

regression equation. The overall F value and significance are also shown. Finally, the linear regression equation for the Hoppock measure is presented.

The JDS variable Growth Satisfaction explained 62 to 65 percent of the total variance of the Hoppock Measure of Job Satisfaction for the total sample population and the three tactical squadrons--the 7th ARS, 9th BS, and the 20th BS. Both regressions for the sample population and the two bomb squadrons contain the same variables, Career Intentions and Dealing with Others, explaining another four percent of the variation in job satisfaction.

Several other variables came into the regression equation for the 7th ARS beside the variable Career Intentions. These were the JDS variables Internal Motivation, Social and Supervisory Satisfaction, and the demographics age and OER Index. They made up another 28 percent of the variation for a total of 93.7 percent of the variation of job satisfaction being explained at the .05 significance level. Each variable explained from 2.6 to 9.2 percent of the variance. All the JDS variables for the 7th ARS dealt with the affective reactions or private feelings that these individuals get from doing their job.

For the three tactical squadrons, the emergence of the variable Growth Satisfaction as the most important predictor of job satisfaction indicates that these individuals get the largest proportion of their job satisfaction from performing the job itself. None of the core job dimensions

that the Hackman-Oldham theory says need to be present to improve employee work motivation, satisfaction, and performance, showed up. They are being satisfied by their private affective reactions or feelings they receive from the job, not because the job is high on the core dimensions of Skill Variety, Task Identity, Task Significance, Autonomy, and Feedback from the Job.

In this case where the affective dimension Growth Satisfaction is the most important determinant of job satisfaction, the indications are that these respondents are reasonably satisfied with aspects of the job such as job challenge, independent thought and action in the job, and in amount of worthwhile accomplishment felt by doing the job. These findings are in accordance with other studies conducted on Air Force personnel. Vrooman and Thompson both, in looking at job satisfaction levels using data from the 1975 Quality of Life Survey, found that job satisfaction was primarily a function of three variables, job challenge, personal growth satisfaction, and the perception of being prepared to assume future positions of responsibility (Vrooman, 1976:61). The first two variables seem to be measured by the JDS variable Growth Satisfaction and the third seems to be related to the variable Career Intentions, which also showed up in the regression equations.

Different variables came into the regression equation for the 4018 CCTS. The variable Social Satisfaction explained 55.6 percent of the variation in job satisfaction, while the

job core dimension Task Significance explained another 10.9 percent and the demographic variable OER index another 4.1 percent. These three variables explained a total of 70.6 percent of the variation of job satisfaction. These findings are apparent when the definitions of Social Satisfaction and Task Significance are reviewed.

Social Satisfaction refers to the degree to which individuals are satisfied with the people they work with on the job and the chance to get to know and to help other people. The job characteristic Task Significance pertains to the degree with which a job has a substantial impact on the lives of others. In the 4018 CCTS, these two variables explain the very nature of the job of being an instructor. New students are met and helped to become combat ready crew members. Not only are they helped in these matters, but meaningful personal relationships are formed between the students and the instructors whereby help can be given the student in personal areas also. Therefore, the instructors of the 4018 CCTS perceive themselves as having a substantial impact on the lives of others in the areas of the student's future job and his career in the Air Force.

The third variable that entered for the 4018 CCTS was the demographic, OER index. Its coefficient was negative meaning that as job satisfaction increases, the OER index goes down, which indicates a better OER rating. This implies that better OER's indicate better job satisfaction.

Overall, the important variables that came into the

regression equations were the affective reactions to the job--Growth Satisfaction for the 7th ARS, 9th BS and 20th BS, and Social Satisfaction for the 4018 CCTS. This finding implies that most of the job satisfaction in this organization is coming from the personal private feelings that a person gets from working on the job, not from the objective characteristics of the job. For the 4018 CCTS though, the core dimension Task Significance did explain 10.9 percent of the variation in job satisfaction. This compares favorably with all the other analyses done in this research, which shows this squadron to be the highest and significantly different from the other squadrons on the five core dimensions and many of the affective reactions to the job. Further analysis pertaining to these aspects of the four squadrons will be evaluated next with the use of job diagnostic tools.

Job Diagnosis

As a final step in the analysis of job satisfaction levels and factors affecting them among the four squadrons, the job diagnostic tools of Hackman and Oldham's Job Characteristic Model will be employed. Table XVIII shows the equation for the MPS for each squadron, plus mean scores for the Hoppock Measure of Job Satisfaction and the JDS variables Individual Growth Need Strength and Internal Motivation. These are shown because the theory says that positive personal and work outcomes (high internal motivation, high work satisfaction, high quality performance, and low absenteeism and turnover) are obtained when the three "critical

Table XVIII
Job Diagnostic Tools (Squadrons)

MPS Equation

Squadron	Skill Variety	Task Identity	Task Significance		Autonomy		Feedback		MPS
7th ARS	$\frac{5.03 + 5.12 + 5.58}{3}$			x	4.00	x	5.37	=	118.42
9th BS	$\frac{4.27 + 4.65 + 5.09}{3}$			x	3.83	x	4.63	=	93.25
20th BS	$\frac{4.63 + 4.64 + 5.23}{3}$			x	3.84	x	4.91	=	98.93
4018 CCTS	$\frac{5.39 + 5.33 + 6.09}{3}$			x	5.45	x	5.41	=	172.39

Means of Other Pertinent Variables

	7th ARS	9th BS	20th BS	4018 CCTS
Hoppock Measure of Job Satisfaction	18.35	16.92	17.51	20.49
Internal Motivation	5.50	5.52	5.64	6.23
Individual Growth Need Strength	5.73	6.15	6.09	6.09
Growth Satisfaction	4.52	4.01	4.00	5.43

psychological states" discussed in Chapter I are present. These states are created by the presence of the five core dimensions.

The theory also states that "individuals who strongly value and desire personal feelings of accomplishment and growth should respond very positively to a job high in motivating potential" (Hackman and Oldham, 1974a:4). Growth need strength is predicted by the theory to be a moderator of these relationships specified by the theory and to affect how positively employees will respond to jobs with high motivating potential.

As seen from Table XVIII, and referring to the fact that there were no significant mean differences in the variable Individual Growth Need Strength, the individuals in the four squadrons are fairly high in this area. Even though the three tactical squadrons were significantly different from the 4018 CCTS on their means scores on the variable Growth Satisfaction, this variable explained 65 percent of the variance in job satisfaction. With these facts in mind, according to the theory, these people should respond very positively to a job high in motivating potential. The problematic areas then seem to be in the areas of motivation and satisfaction.

In these two areas, job satisfaction and internal motivation, the three tactical squadrons were found to be significantly different from the 4018 CCTS. Assuming that these are the problem areas, the next step outlined by

Hackman and Oldham is to ask the question, "Is the job low in motivating potential?" From previous analysis all three tactical squadrons are lower than the 4018 CCTS on the MPS and the means were once again significantly different. The next step is to find out what specific aspects of the job are causing the difficulty. Since the 4018 CCTS has the highest MPS and is generally higher on every other measure of the JDS, it will be used as the ideal.

From the *t*-test analysis it was found that the 7th ARS was only significantly different from the 4018 CCTS on one core dimension, Autonomy. Both the 9th BS and the 20th BS were significantly different on all five core dimensions. Profiles of the four squadrons on the core job dimensions are shown in Figure 3.

From this profile of the core dimensions and the MPS, the strengths and weaknesses of the four squadrons can be seen. As mentioned above, the 7th ARS is significantly lower than the 4018 CCTS on one dimension, Autonomy, while the 9th and 20th Bomb Squadrons are significantly lower on all five dimensions, especially Autonomy. Recommendations for improvements in the jobs low in core dimensions, thus leading to an increase in the motivating potential of the job as a whole, will be discussed in the final chapter.

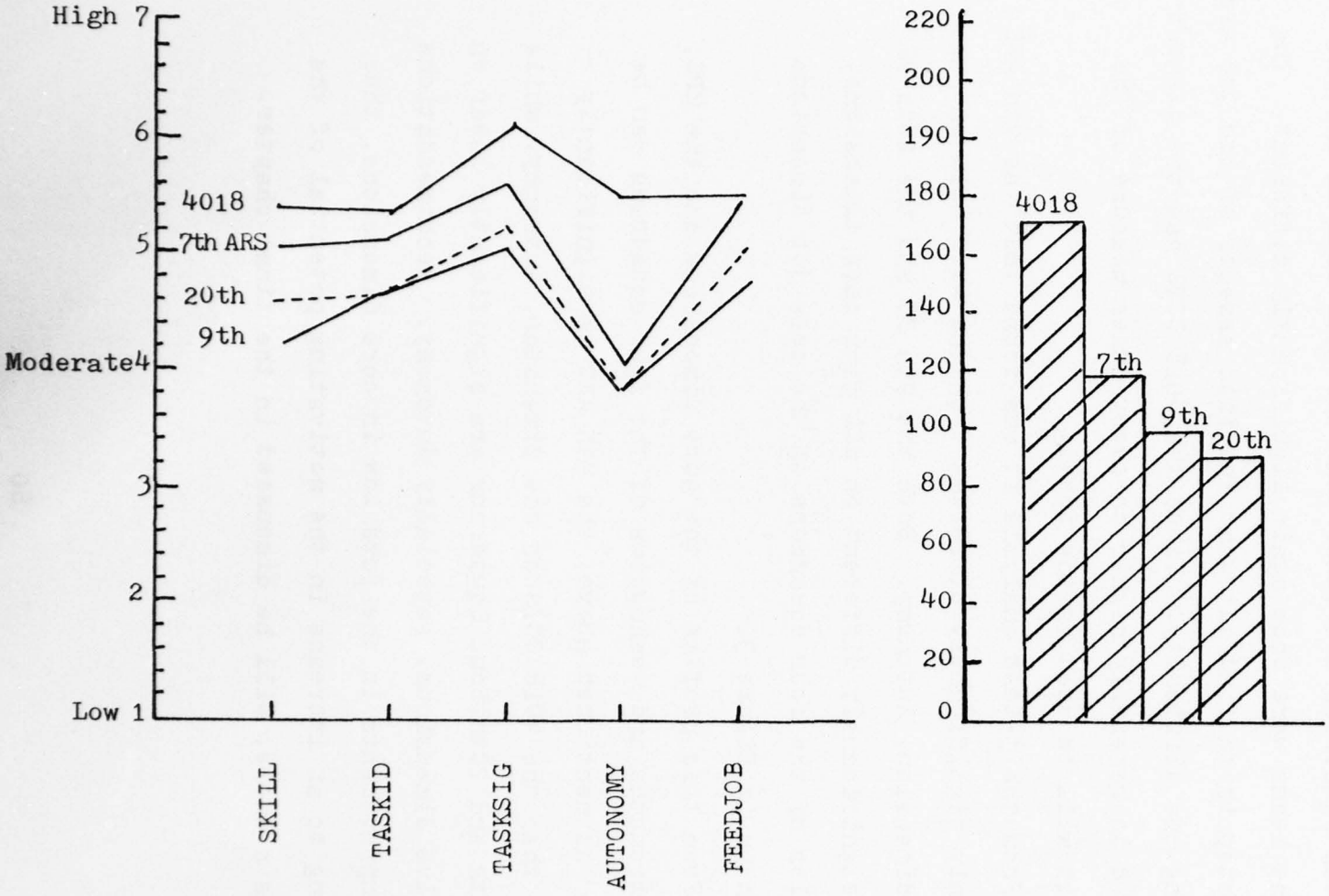

Figure 3. JDS Profiles of the Squadrons

SECTION II

Data Analysis by Crew Positions

In this section the author will divide the sample population into crew positions for analysis of the specific flying specialties. The same pattern of analysis done on the four flying squadrons will be followed in this section. Since detailed explanations were made in Section I concerning how the analysis was structured and how it works, that discussion will be omitted in this section. The different tables showing the means of the crew positions, correlation analysis, *t*-test, and regression analysis will be shown with brief discussions of the most important points following each presentation.

Variable Mean Score Analysis

Table XIX contains selected variable mean scores by crew position. Since the sample size for Boom Operators (BO) is so small, n=8, these means will be shown only as indications of how these crew members perceived their job. By observation, this group scored high on most of the variables measured by the questionnaire. Their Hoppock Measure of Job Satisfaction (20.6) and the MPS (157.07) are the highest for the crew positions, indicating that this might be a well-satisfied and motivated group.

In this analysis conducted on the crew positions, it is assumed that the mixture of the Pilot (P), Co-pilot (CP), and Navigator (N) crew positions for the two different aircraft -- the B-52 and the KC-135 -- will not affect any of

Table XIX
Variable Means by Crew Positions

	Pilot N=50	Co-Pilots N=31	Radar Navigators N=43	Navigators N=31
1. Skill Variety	5.36**	5.11	4.67	4.90
2. Task Identity	5.20	4.60	4.79	5.20**
3. Task Significance	5.71**	5.60	5.45	5.57
4. Autonomy	4.57	3.40*	4.46	4.20
5. Feedback from Job	5.11	5.09	4.98	5.26**
6. Feedback from Agents	5.03**	4.98	4.51	4.37
7. Dealing with Others	6.51**	6.39	6.33	6.26
8. General Satisfaction	5.01**	4.69	4.91	4.44
9. Pay Satisfaction	4.79	4.71	4.36	4.14
10. Internal Motivation	5.91	5.81	5.93**	5.65
11. Security Satisfaction	3.90	3.77	3.92**	2.69
12. Social Satisfaction	5.61	5.04	5.35**	5.00*
13. Supervisory Satisfaction	5.23	4.99	4.73	4.68
14. Growth Satisfaction	4.93	4.37	4.76	4.06
15. Individual Growth Need Strength	6.02	6.15	6.30**	6.03
16. Motivating Potential Score	135.85	93.95	119.15	122.19
17. Hoppock Measure of Job Satisfaction	19.62**	17.61	18.53	17.35
18. Age	32.22	26.17*	32.42**	27.37
19. Educational Level	4.64	4.58	4.74	4.77
20. Federal Military Service	9.72	4.16*	10.65	4.90
21. Organizational Climate	4.11	3.59	3.87	3.40
22. Communications	5.07	5.25	4.74	4.52
23. Rewards of Organization	3.90**	3.32	3.43	2.67
24. Career Intentions	4.22**	3.61	4.12	3.42*
25. OER Index	2.31	2.08**	2.21	2.48

**Highest mean score excluding scores for boom operators.
*Lowest mean scores.

Table XIX (continued)

	Electronic Warfare Officers N=47	Gunners N=33	Boom Operators N=8
1. Skill Variety	4.12	4.12*	5.75
2. Task Identity	4.59*	4.90	5.17
3. Task Significance	4.71*	5.41	6.25
4. Autonomy	4.01	4.71**	5.08
5. Feedback from Job	4.55*	4.93	5.46
6. Feedback from Agents	3.46*	4.81	5.13
7. Dealing with Others	5.82*	6.20	6.21
8. General Satisfaction	4.18	4.88	5.75
9. Pay Satisfaction	4.97**	3.26*	3.50
10. Internal Motivation	5.39*	5.75	5.72
11. Security Satisfaction	2.23*	4.26	5.13
12. Social Satisfaction	5.13	5.21	5.92
13. Supervisory Satisfaction	3.70*	5.37**	5.67
14. Growth Satisfaction	3.66*	4.43	5.63
15. Individual Growth Need Strength	6.10	6.00*	5.58
16. Motivating Potential Score	90.67*	136.20**	157.07
17. Hoppock Measure of Job Satisfaction	16.34*	18.76	20.63
18. Age	30.52	29.66	31.57
19. Educational Level	4.89**	2.85*	2.50
20. Federal Military Service	8.41	11.12**	13.63
21. Organizational Climate	3.33*	4.15**	4.49
22. Communications	4.19*	5.52**	5.70
23. Rewards of Organization	2.57*	3.25	4.00
24. Career Intentions	3.70	3.94	4.50
25. OER Index	2.67*		

**Highest mean score excluding scores for boom operators.
*Lowest mean scores.

the statistical tests. This mixture is already in the 4018 CCTS, where instructors train students in both aircraft.

The crew positions Pilot, Radar Navigator, and Gunner scored the highest on most of the variables. Pilots were the highest on the core dimensions Skill Variety and Task Significance, and also two other objective characteristics of the job, Dealing with Others and Feedback from Agents.

Since the pilot is the aircraft commander and supervisor of his crew, he can employ a variety of skills other than his flying skills. He has to manage his crew and make sure that they get the mission accomplished, whether it is ground training, flying, or sitting alert. His impact is substantial on the lives of his crew members. He is their formal leader and he is the one who can reward them according to their performance by how he rates them in their Officer Effectiveness Reports and Airman Performance Reports.

The pilot is in the position to channel communications from the crew to his squadron and wing supervisors. He also receives most of the feedback from these supervisors for his crew. Any rewards given to the crew are usually handed out to the aircraft commander, thus, his higher score on the variable Rewards of the Organization. For B-52's especially, the pilot is responsible for the overall performance of his crew, but a lot of reward goes to the radar navigator when his bombs are on target.

The pilot also has the highest score on the Hoppock

Measure of Job Satisfaction (19.6), General and Growth Satisfaction. These three variables have been found previously to correlate highly together. He is high on the demographic variable Career Intentions, implying that since he has a rewarding and satisfying job, he will make a career out of the Air Force.

Radar Navigators are the highest on the affective reactions to the job, Internal Motivation, Security and Social Satisfaction. Their satisfaction with job security is backed up by their good OER index of 2.21. (Under the present OER quota system of having 22 percent one's, 28 percent two's and 50 percent three's or below, the mean rating should be 2.28.) They also have the highest mean score on Individual Growth Need Strength.

The Gunners are higher on the core dimension, Autonomy. This is indicative of his job. First of all, he is the only enlisted man on the crew and secondly, a gunner on a B-52D model sits in the tail section alone throughout the flying mission. This job provides him with substantial freedom and independence in determining what to do in his job. Gunners are known throughout SAC for being a close-knit group. This shows up in the more "organic" rating they give their organizational climate. They usually rely on each other and are independent of other groups in the wing. This is also evidenced by the higher score on the variable Communications of the organization.

Their high score on the Hoppock measure (18.75) and

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A CASE STUDY OF JOB SATISFACTION AT A STRATEGIC AIR COMMAND BOM--ETC(U)
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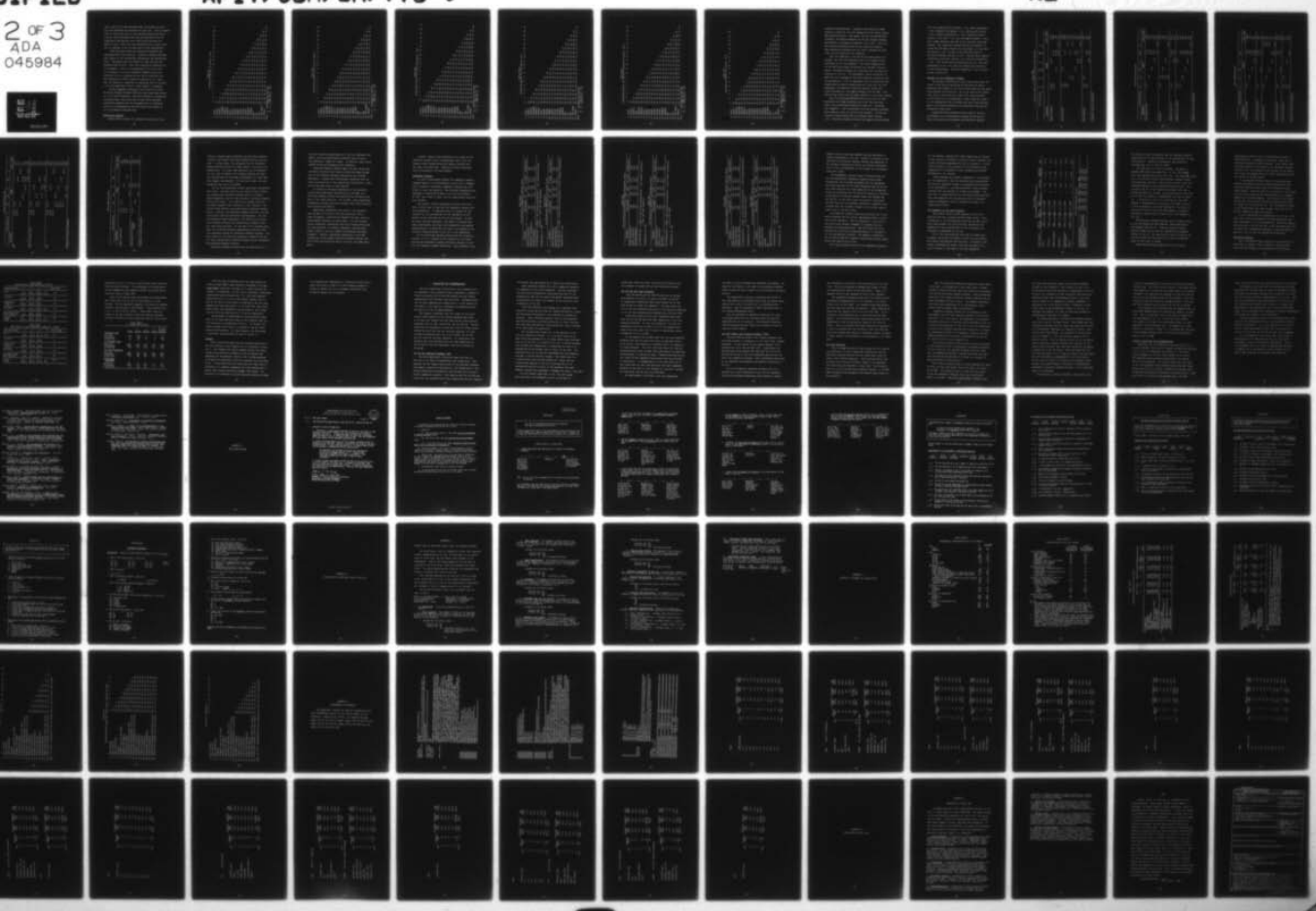

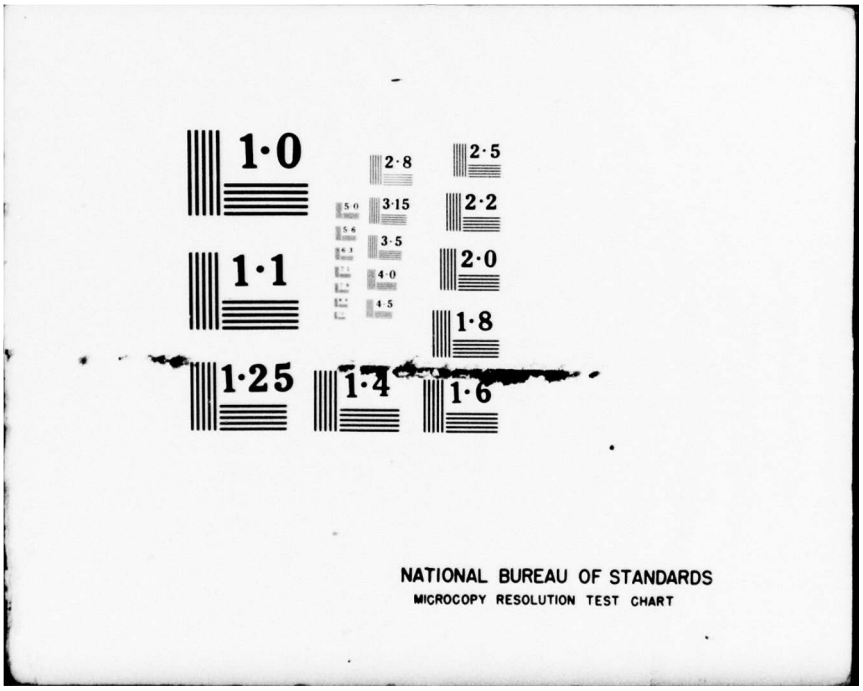
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

their score on the MPS indicates that the gunners at Carswell are satisfied and motivated in their job. This is further seen in their high score on the variable Supervisory Satisfaction, which indicates that they are satisfied with the supervision they get get from their pilots and from the gunner's shop. Their one main dissatisfaction is with their pay, as implied on the low mean score in Pay Satisfaction.

Other high mean scores are scattered throughout the remaining three crew positions. Electronic Warfare Officers were higher on the variables Pay Satisfaction and Educational Level. Navigators were the highest on Task Identity and Feedback from the Job. These two variables go together for the navigator. When he is navigating the KC-135 or B-52 on the mission, he can get immediate feedback about how effective he is in carrying out his job by plotting a fix and finding out if that is where he planned to be. Also, when his mission is completed, he perceives that he has done a job from beginning to end or "from takeoff to landing."

The most apparent observation from Table XIX is that Electronic Warfare Officers (EW) have the lowest mean scores on 16 of the 25 variables. When the difference in means are discussed later, this point will be more fully explored. Correlation analysis will be discussed next in looking at levels of job satisfaction and the factors that affect it for the different crew positions.

Correlation Analysis

Tables XX-XXV contain the correlation matrices for the

Table XX
Correlation Matrix for Pilots N=50

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	34																		
3. TASKSIG	40	21																	
4. AUTONOMY	57	31	45																
5. FEEDJOB	31	37	48	47															
6. FEEDSUP	38	11	38	47	62														
7. ASSOC	16	-01	49	24	55	47													
8. GENSAT	58	27	44	52	52	57	29												
9. PAYSAT	07	-11	08	22	22	25	17	08											
10. INTMOV	30	11	47	32	45	41	45	51	22										
11. SECSAT	23	19	38	50	40	30	24	35	43	23									
12. SOCSAT	40	33	50	56	43	40	15	48	23	28	49								
13. SUPSAT	39	24	31	43	50	71	23	45	15	41	27	39							
14. GWTHSAT	65	21	51	73	56	59	42	74	31	57	47	61	49						
15. INDGWTH	06	25	33	11	27	14	07	18	-02	25	25	42	20	20					
16. MPS	65	53	59	91	71	56	38	62	20	40	53	65	51	76	23				
17. HO	59	28	44	61	56	63	23	78	24	45	47	53	57	83	12	69			
18. AGE	39	42	43	44	12	13	-02	32	-07	16	17	36	27	31	01	49	42		
19. OER INDEX	-07	-19	-27	-23	-03	08	-02	-20	-02	01	-38	-12	11	-10	-23	-21	-10	-08	
20. CARINT	52	22	48	55	40	30	16	61	33	22	43	60	29	67	06	59	63	36	-14

Note: 1. Decimals are omitted.
2. r = .2341 for p = .05
3. r = .3341 for p = .01

Table XXI
Correlation Matrix for Co-Pilots (N=31)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	13																		
3. TASKSIG	51	37																	
4. AUTONOMY	05	62	13																
5. FEEDJOB	31	36	61	09															
6. FEEDSUP	10	18	36	24	41														
7. ASSOC	24	16	36	-05	38	24													
8. GENSAT	20	44	41	70	13	58	12												
9. PAYSAT	38	23	-22	36	-02	00	-02	23											
10. INTMOV	51	10	53	25	18	33	35	65	08										
11. SECSAT	08	39	01	38	15	21	-13	34	36	01									
12. SOCSAT	32	44	14	62	04	29	19	67	58	51	27								
13. SUPSAT	15	46	30	52	14	54	-05	63	24	29	30	59							
14. GWTHSAT	25	47	46	72	11	28	15	83	19	67	21	63	49						
15. INDGWTH	41	19	13	18	46	30	23	22	39	24	08	45	39	08					
16. MPS	38	76	52	79	59	44	20	64	30	34	43	58	54	63	40				
17. HO	39	41	47	47	05	25	11	79	14	74	21	66	53	82	17	48			
18. AGE	08	-16	05	-19	-11	02	-10	-08	-22	02	-43	-20	08	-15	14	-22	-11		
19. OER INDEX	-19	-04	00	-06	-01	-20	05	-07	-16	09	-12	-11	08	02	08	-10	-11	-02	
20. CARINT	01	31	15	39	-21	-07	-02	44	38	08	-40	45	24	46	17	16	53	34	18

Note: 1. Decimals are omitted.
2. r = .2980 for p = .052
3. r = .4121 for p = .01

Table XXII
Correlation Matrix for Radar Navigators N=43

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	27																		
3. TASKSIG	49	17																	
4. AUTONOMY	50	47	50																
5. FEEDJOB	19	28	32	34															
6. FEEDSUP	30	09	41	11	49														
7. ASSOC	18	03	14	11	44	24													
8. GENSAT	61	19	69	66	28	31	21												
9. PAYSAT	21	21	-07	19	36	10	11	22											
10. INTMOV	43	13	23	44	02	19	32	51	14										
11. SECSAT	40	28	35	38	32	27	03	59	48	08									
12. SOCSAT	33	31	54	48	31	12	41	66	18	38	44								
13. SUPSAT	28	02	41	21	27	58	22	40	12	-06	65	29							
14. GWTHSAT	65	35	70	71	39	37	32	83	18	60	50	71	32						
15. INDGWTH	13	18	04	01	13	20	62	10	-11	34	-15	16	-03	11					
16. MPS	52	59	50	86	68	28	24	64	35	40	50	52	25	71	12				
17. HO	50	22	61	59	21	25	33	86	25	49	52	62	40	82	18	52			
18. AGE	12	10	21	28	16	-15	-22	27	38	11	39	25	-14	23	-28	38	14		
19. OER INDEX	-05	01	-16	-09	05	-28	-08	-11	-01	14	-11	-05	-35	-14	-15	04	-26	35	
20. CARINT	34	03	36	47	09	12	01	59	29	18	44	28	27	40	-05	43	53	41	-09

Note: 1. Decimals are omitted.
2. r = .2535 for p = .05
3. r = .3469 for p = .01

Table XXIII
Correlation Matrix for Navigators N=31

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	09																		
3. TASKSIG	49	41																	
4. AUTONOMY	62	35	50																
5. FEEDJOB	11	11	31	28															
6. FEEDSUP	23	-15	01	33	55														
7. ASSOC	18	15	22	41	39	24													
8. GENSAT	48	42	40	58	27	34	26												
9. PAYSAT	23	19	14	35	03	-10	39	19											
10. INTMOV	43	33	43	47	39	33	30	41	42										
11. SECSAT	-11	24	11	08	-32	-19	24	15	45	14									
12. SOCSAT	31	-01	16	38	27	45	37	30	38	48	24								
13. SUPSAT	27	-09	19	63	30	52	39	41	32	43	11	66							
14. GWTHSAT	66	28	56	79	41	40	47	66	39	60	17	66	62						
15. INDGWTH	09	02	18	03	11	31	-17	12	07	25	21	43	25	24					
16. MPS	62	44	64	86	63	44	40	61	23	55	-07	43	52	81	20				
17. HO	54	37	50	62	37	35	39	89	32	47	17	47	42	79	09	67			
18. AGE	38	-05	24	04	-10	-00	-02	-02	-14	-11	-31	-20	-10	03	-23	03	-03		
19. OER INDEX	10	-20	-14	-14	18	15	-12	33	01	-22	-12	08	-08	08	-03	-02	31	-12	
20. CARINT	48	44	44	63	08	-02	14	72	42	25	03	10	23	55	-15	52	66	13	14

Note: 1. Decimals are omitted.
2. r = .305 for p = .05
3. r = .4053 for p = .01

Table XXIV

Correlation Matrix for Electronic Warfare Officers N=47

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SKILL	--																		
2. TASKID	39																		
3. TASKSIG	20	41																	
4. AUTO	43	45	32																
5. FEEDJOB	23	39	52	41															
6. FEEDSUP	23	24	56	55	40														
7. ASSOC	41	18	53	17	22	30													
8. GENSAT	52	43	68	44	33	56	62												
9. PAYSAT	18	10	-09	00	11	11	11	17											
10. INTMOV	49	46	44	35	31	44	44	79	22										
11. SECSAT	19	15	34	36	25	53	28	37	17	24									
12. SOCSAT	51	35	41	33	34	44	42	62	29	66	01								
13. SUPSAT	15	28	52	45	38	67	46	53	24	40	37	45							
14. GWTHSAT	51	50	60	68	46	62	43	82	18	72	42	63	56						
15. INDGWTH	02	-09	-18	-04	-04	-06	-04	01	-10	15	12	00	-23	-02					
16. MPS	62	64	60	80	73	55	38	57	07	47	40	49	41	73	-06				
17. HO	47	47	64	49	37	47	57	87	16	78	35	55	48	81	-04	58			
18. AGE	34	08	22	23	15	39	42	42	16	34	42	44	20	26	25	31	30		
19. OER INDEX	-21	-13	01	03	05	-17	-32	-25	-22	-15	-25	-16	-15	-25	-08	01	-25	-05	
20. CARINT	20	29	29	29	04	37	43	55	50	23	28	31	42	47	-04	20	57	50	-.05

Note: 1. Decimals are omitted.
2. r = .2398 for p = .05
3. r = .3413 for p = .01

Table XXV
Correlation Matrix for Gunners N=33

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. SKILL	--																	
2. TASKID	43																	
3. TASKSIG	89	41																
4. AUTONOMY	74	47	74															
5. FEEDJOB	76	50	77	63														
6. FEEDSUP	42	26	47	44	61													
7. ASSOC	50	25	53	52	52	55												
8. GENSAT	65	37	73	57	63	49	64											
9. PAYSAT	34	29	53	47	56	43	28	50										
10. INTMOV	62	34	57	49	43	18	22	49	34									
11. SECSAT	13	04	25	39	37	44	33	28	64	10								
12. SOCSAT	66	40	72	72	66	48	54	67	52	45	47							
13. SUPSAT	23	-01	29	36	37	40	37	25	43	34	52	57						
14. GWTHSAT	77	38	83	75	68	54	50	77	58	63	45	90	52					
15. INDGWTH	-21	-32	-18	-22	-30	-16	-32	-29	-11	-16	-27	-17	-13	-18				
16. MPS	86	54	81	87	81	49	40	52	46	50	24	61	29	70	-22			
17. HO	66	24	71	55	59	50	68	87	45	47	36	75	41	83	-24	50		
18. AGE	55	31	47	38	33	10	21	38	22	34	07	31	11	42	-36	48	48	
19. CARINT	55	47	51	37	55	31	42	49	41	40	11	54	37	56	-22	45	53	67

Note: 1. Decimals are omitted.
2. $r = .2904$ for $p = .05$
3. $r = .3985$ for $p = .01$

different crew positions. Generally they follow the same pattern as found for the four squadrons and the other studies mentioned previously. Once again, the two job satisfaction variables, the Hoppock measure and the JDS variable General Satisfaction, are highly correlated (.78 to .89). The variable Growth Satisfaction and the two above have similar high correlation patterns with the other variables and each other, as was found with the squadrons.

With the exception of the Pilots and particularly the Gunners, the five core dimensions are not as highly intercorrelated as for the squadrons. But these dimensions are for the most part highly correlated with the MPS, while as before, the Hoppock measure is correlated with the affective reactions to the job. The demographic Career Intentions is again the only demographic with high positive correlation with job satisfaction. This is especially true for the Pilots and Gunners where moderate correlations are found with the core dimensions, the affective reactions General, Social and Growth Satisfaction, the Hoppock measure, and the MPS. This implies that these jobs are areas conducive tc Air Force careers.

When the subprogram PEARSON CORR was run for the total population with dummy variables set up for the crew positions, some interesting correlations came out. Co-pilots had a negative (-.22) relationship with the variable Autonomy, which reflects their low score on the variable. Pilots had a positive relationship with the variable Skill Variety (.24). Electronic Warfare Officers had negative relationships

with the variables Skill Variety (-.23), Task Significance (-.26), Feedback from Agents (-.35), Dealing with Others (-.24), Security Satisfaction (-.33), Supervisory Satisfaction (-.36), MPS (-.19), and the Hoppock measure (-.19). Also, dummy variables were set up for the first three OER ratings. The correlation between Electronic Warfare Officers and the dummy variable for receiving a 3 on the OER was positive (.27), as seen in the mean OER index for Electronic Warfare Officers of 2.67. Gunners had a negative correlation with Skill Variety (-.19) and Pay Satisfaction (-.27). Even though these correlations are low, they were significant at the .001 level and indicate the direction of the relationships. They are comparable to the low mean scores of Table XIX.

Analysis of the Difference in Means

The research hypothesis for this study states that the levels of and factors affecting job satisfaction differ among the crew members of the four flying squadrons and among the different crew positions. As is the case of the squadrons, this is true only for a few of the crew positions for the level of job satisfaction. Even though the levels of job satisfaction did not differ for every crew position, many of the factors affecting job satisfaction did and are presented in Table XXVI.

Significant mean differences were found in the Hoppock Measure of Job Satisfaction between Pilots and two other crew positions--Navigators and Electronic Warfare

Table XXVI
t-Test for Mean Differences Between Crew Positions

Crew Positions	P	CP	RN	N	EW	G	
N	50	31	43	31	47	33	
VARIABLES	MEANS						SIGN. LEVEL
Hoppock Measure	19.62			17.35			.018
	19.62				16.34		.000*
			18.53		16.34		.024
					16.34	18.76	.035
Skill Variety	5.36		4.67				.003*
	5.36				4.13		.000*
	5.36					4.12	.000*
		5.11			4.13		.001
		5.11				4.12	.013*
			4.67		4.13		.041
				4.90	4.13		.008
				4.90		4.12	.042
Task Identity	5.20	4.60					.031
	5.20				4.59		.019
				5.20	4.59		.042

*Separate Variance Estimates

Table XXVI(continued)

Crew Positions	P	CP	RN	N	EW	G	
VARIABLES			MEANS				SIGN. LEVEL
Task Significance	5.71				4.71		.000*
		5.60			4.71		.002
			5.45		4.71		.016
				5.57	4.71		.009
					4.71	5.41	.044
Autonomy	4.57	3.40					.000
		3.40	4.46				.003
		3.40		4.20			.021
		3.40				4.71	.013
Feedback from Job	5.11				4.54		.025
				5.26	4.54		.013
Feedback from Agents	5.03			4.37			.016
	5.03				3.46		.000
		4.98			3.46		.000
			4.51		3.46		.001
				4.37	3.46		.007
					3.46	4.81	.000

*Separate Variance Estimates

Table XXVI (continued)

Crew Positions	P	CP	RN	N	EW	G	
VARIABLES	MEANS						SIGN. LEVEL
Dealing with Others	6.51				5.82		.000*
		6.39			5.82		.003
			6.33		5.82		.010
				6.26	5.82		.045
General Satisfaction	5.01				4.18		.006
			4.91		4.18		.024
Pay Satisfaction	5.01					3.26	.001
		4.71				3.26	.004
			4.36			3.26	.007
				4.14	4.97		.019
					4.97	3.26	.000
Internal Motivation	5.91				5.39		.024*
			5.93		5.39		.022*
Social Satisfaction	5.61	5.04					.005
	5.61			5.00			.003
	5.61				5.13		.017*

*Separate Variance Estimates

Table XXVI(continued)

Crew Positions	P	CP	RN	N	EW	G	
VARIABLES	MEANS						SIGN. LEVEL
Security Satisfaction	3.90			2.69			.012
	3.90				2.23		.000
		3.77		2.69			.012
		3.77			2.23		.000
			3.92	2.69			.005
			3.92		2.23		.000
				2.69		4.26	.000
					2.23	4.26	.000
Supervisory Satisfaction	5.23				3.70		.000
		4.99			3.70		.000
			4.73		3.70		.002
				4.68	3.70		.006
					3.70	5.37	.000
Growth Satisfaction	4.93	4.37					.050
	4.93			4.06			.003
	4.93				3.67		.000*
			4.76	4.06			.029
			4.76		3.67		.001

*Separate Variance Estimates

Table XXVI(continued)

Crew Positions	P	CP	RN	N	EW	G	
VARIABLES			MEANS				SIGN. LEVEL
MPS	135.85	93.95					.010
	135.85				90.67		.001
		93.95				136.20	.05
			119.15		90.67		.032
				122.19	90.67		.024
					90.67	136.20	.018*
Rank (Officers Only)	12.24	11.45					.000
	12.24			11.48			.000
		11.45	12.32				.000
		11.45			12.02		.000*
			12.32	11.48			.000
				11.48	12.02		.004
Age	32.22	26.17					.000*
	32.22			27.37			.000*
	32.22					29.65	.028
		26.17	32.42				.000*
		26.17		27.37			.024
		26.17			30.52		.000*
		26.17				29.65	.004*
			32.42	27.37			.000*

*Separate Variance Estimates

Table XXVI(continued)

Crew Positions	P	CP	RN	N	EW	G	
VARIABLES			MEANS				SIGN. LEVEL
Career Intentions	4.22	3.61					.006
	4.22			3.42			.004*
	4.22				3.70		.038*
			4.12	3.42			.021
OER Index (For Officers Only)	2.31			2.67			.007*
		2.08		2.67			.002*
			2.21	2.67			.004*

*Separate Variance Estimates

Officers, between Radar Navigators and Electronic Warfare Officers, and between Electronic Warfare Officers and Gunners. In these cases, the Navigators and the Electronic Warfare Officers had the low mean scores, 17.35 and 16.34, respectively. For these crew positions the null hypothesis (H_0) that the means on the Hoppock measure are equal was rejected and the alternative hypothesis (H_1) that they were unequal was accepted. For the other cases, the null hypothesis (H_0) was not rejected.

For the core dimensions several significant differences were found. The mean score for the variable Skill Variety was significantly different between Pilots, Co-pilots, Radar Navigators, and the crew positions, Electronic Warfare Officer and Gunner. Also, mean scores between the Pilot and Radar Navigator were different on this variable. The variable Task Identity was significantly different between Pilots, Co-pilots, and Electronic Warfare Officers, who had a mean score that was different from Navigators. For the core dimension Task Significance, the mean score for Electronic Warfare Officers was statistically different from the other crew positions. In the case of the variable Autonomy, the Co-pilots differed significantly from the other crew positions, except for Electronic Warfare Officers. The mean scores for the last core dimension, Feedback from the Job, were statistically different between Pilots, Navigators, and Electronic Warfare Officers.

Electronic Warfare Officers also had mean scores on

one more objective characteristic of the job, Feedback from Agents, that was significantly different from the other crew positions, except for Gunner. In addition, mean scores between Pilots and Navigators were different.

Electronic Warfare Officers again had mean scores significantly different from those of Pilots and Radar Navigators on the variables General Satisfaction and Internal Motivation. Gunners were statistically different from the other crew positions on the variable Pay Satisfaction. They had the low mean score on this variable.

In looking at the mean differences of the variables Security and Supervisory Satisfaction and the MPS, the Electronic Warfare Officer crew position was different from most of the other positions. For the MPS, other significant differences in means were found between Pilots and Co-pilots, and Co-pilots and Gunners.

Significant differences were found in the variables rank and age, but three of the crew positions, Pilots, Radar Navigators, and Electronic Warfare Officers, were not significantly different in these areas. For the variable Career Intentions, differences were found between Pilots and the crew positions of Co-pilot, Navigator, and Electronic Warfare Officer, and also between the Navigator and Radar Navigator. Finally, significant differences on the OER ratings were found between Electronic Warfare Officers and three other crew positions--Pilot, Co-pilot, and Radar Navigator.

Overall, these t-tests performed on the means of the different variables show overwhelmingly that a true difference exists between Electronic Warfare Officers and the other crew positions. Reasons for these differences will be discussed in the next chapter.

Regression Analysis

To find a relationship between the dependent variable (Hoppock Measure of Job Satisfaction) and a set of independent or predictor variables, regression analysis was conducted on each crew position. The different regressions are presented in Tables XXVII-XXXII, with the beta weights, R^2, ΔR^2, the overall F value, and the significance shown for each variable.

The variable Growth Satisfaction was the first variable in every case to come into the regression equation for job satisfaction. It explained from 61.8 percent of the variation in job satisfaction for the Navigators to 69.1 percent of the variation for Pilots and Gunners. As with the three tactical squadrons, this seems to indicate that these crew members can obtain job satisfaction from growth characteristics of doing the job itself, not because of the objective characteristics of the job or core dimensions.

For the Electronic Warfare Officers and the Co-pilots, another 7.6 to 8.1 percent of the variation in job satisfaction was explained by another affective reaction to the job, the variable Internal Motivation. This variable is the

Table XXVII
Job Satisfaction Regression (Pilots, N=50)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.709	.691	.691	105.2	.000
Supervisory Satisfaction	.222	.727	.036	61.3	.000
9th Bomb Squadron	-.172	.757	.030	46.6	.000

Job Satisfaction = 4.188*+ 1.911 (Growth Satisfaction) + .717 (Supervisory Satisfaction) - 1.367 (9th Bomb Squadron)

*Significant at .000

Table XXVIII
Job Satisfaction Regression (Co-pilots, N=31)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.574	.665	.665	41.7	.000
Internal Motivation	.367	.741	.076	28.6	.000

Job Satisfaction = -1.910*+ 2.178 (Growth Satisfaction) + 1.720 (Internal Motivation)

*Significant at .553

Table XXIX
Job Satisfaction Regression (Radar Navigators, N=43)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.728	.675	.675	83.2	.000
Career Intentions	.282	.726	.051	51.8	.000
9th Bomb Squadron	.233	.779	.053	44.8	.000

Job Satisfaction = 3.387*+ 2.220 (Growth Satisfaction) + .930 (Career Intentions)
+ 1.895 (9th Bomb Squadron)

*Significant at .019

Table XXX
Job Satisfaction Regression (Navigators, N=31)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.609	.618	.618	38.8	.000
Career Intentions	.289	.689	.071	25.5	.000
OER Index	.225	.739	.050	20.7	.000

Job Satisfaction = 1.609*+ 2.203 (Growth Satisfaction) + 1.060 (Career Intentions)
+ 1.275 (OER Index)

*Significant at .479

Table XXXI
Job Satisfaction Regression (Electronic Warfare Officers, N=47)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction	.467	.661	.661	81.9	.000
Internal Motivation	.351	.742	.081	59.1	.000
Dealing with Others	.218	.779	.037	47.1	.000

Job Satisfaction = -2.056*+ 1.379 (Growth Satisfaction) + 1.318 (Internal Motivation)
+ 1.070 (Dealing with Others)

*Significant at .387

Table XXXII
Job Satisfaction Regression (Gunners, N=33)

Variable	Beta Weight	R^2	ΔR^2	F Value	Significance
Growth Satisfaction		.688	.688	66.1	.000
Dealing with Others		.777	.089	50.6	.000
Autonomy		.810	.033	40.0	.000
Age		.838	.027	35.0	.000
Career Intentions		.858	.020	31.5	.000

Job Satisfaction = -2.732* + 2.33 (Growth Satisfaction) + 1.971 (Dealing with Others)
- .963 (Autonomy) + .236 (Age) - .897 (Career Intentions)

*Significant at .290

degree to which these crew members are self-motivated to perform effectively on the job. Another 3.7 percent of the variation for Electronic Warfare Officers was explained by the variable, Dealing with Others, an objective characteristic of the job pertaining to how closely the crew member works with others.

The demographic variable Career Intentions came into the job satisfaction regression equation after Growth Satisfaction for the Radar Navigators and the Navigators. The third variable for the Radar Navigators was the 9th BS, while OER Index was the third variable for the Navigators. Since the coefficient for the 9th BS is positive, a positive relationship is indicated between these crew members and the 9th BS. On the other hand, the positive coefficient for OER Index for the navigators indicates a negative relationship with this variable because of the rating, where a lower score is the best score.

The affective variable Supervisory Satisfaction is the second variable for the pilots, explaining another 3.6 percent of the variation. This is indicative of the role of the Pilot as an aircraft commander in dealing with his squadron and wing supervisors. The 9th BS was the third variable for the Pilots, explaining another 3.0 percent of the job satisfaction variance. The negative coefficient for the 9th BS implies a negative relationship between being Pilots and being in the 9th BS.

Four other variables came into the regression equation

for the Gunners, dealing with others explaining 8.9 percent of the variation, Autonomy 3.3 percent, Age 2.7 percent, and Career Intentions explaining the last 2.0 percent. A total of 85.8 percent of the variation of job satisfaction was explained for the Gunners by these variables plus Growth Satisfaction, 69.1 percent.

These findings are somewhat comparable to the findings for the squadrons in that the variable Growth Satisfaction was the most important variable in explaining the variation in job satisfaction. As noted previously, these findings coincide with the findings of Vrooman and Thompson. Now that the job satisfaction levels and factors affecting them have been examined, the crew positions will be analyzed using the diagnostic tools of Hackman and Oldham's Job Characteristic Model.

Job Diagnosis of the Crew Positions

Table XXXIII shows the MPS equation for the crew positions and also contains pertinent mean scores. Since differences in job satisfaction levels and the MPS scores were found between the crew positions, the MPS will be examined for each crew position to try to pinpoint any strengths or weaknesses of the job.

All of the crew positions were high in Growth Need Strength, reflecting the degree to which the crew members want growth satisfaction from the work. According to the theory of Hackman and Oldham, they have the basis to be able to relate to jobs high on the core dimensions.

Table XXXIII
MPS Equation for Crew Positions

Crew Position	Skill Variety	Task Identity	Task Significance		Autonomy		Feedback from Job		MPS
Pilot	$\frac{5.36 + 5.20 + 5.71}{3}$			x	4.57	x	5.11	=	135.8
Co-Pilot	$\frac{5.11 + 4.60 + 5.60}{3}$			x	3.40	x	5.09	=	93.9
Radar Navigator	$\frac{4.67 + 4.79 + 5.45}{3}$			x	4.46	x	4.98	=	119.1
Navigator	$\frac{4.90 + 5.20 + 5.57}{3}$			x	4.20	x	5.25	=	122.2
Electronic Warfare Officer	$\frac{4.13 + 4.59 + 4.71}{3}$			x	4.01	x	4.55	=	90.67
Gunner	$\frac{4.12 + 4.90 + 5.41}{3}$			x	4.71	x	4.93	=	136.2

Other Pertinent Mean Scores

	P	CP	RN	N	EW	G
Internal Motivation	5.91	5.81	5.93	5.64	5.39	5.75
Individual Growth Need Strength	6.02	6.15	6.30	6.03	6.10	6.00
Hoppock Measure Job Satisfaction	19.62	17.61	18.53	17.35	16.34	18.75
Growth Satisfaction	4.93	4.37	4.76	4.06	3.66	4.43

The variable Growth Satisfaction was the important variable explaining most of the variation of job satisfaction for each crew position. Therefore, satisfaction and motivation problems seem to be in the job itself.

The next step is to look at the MPS. According to Hackman, MPS scores can range from 1 to 343, and average about 125 (Hackman and Suttle, 1977:134). Are these MPS scores low? For both the Co-pilot and Electronic Warfare Officer crew positions, they are. They are low on some of the core dimensions making up the Motivating Potential Score. The Co-pilots are low in the dimension Autonomy, which has a multiplier effect on the MPS. The problem here is that they do not have the freedom or independence they want in their job. A Co-pilot in a KC-135 or B-52 does not have much freedom or independence in doing his job because it has to be done according to rules and regulations. His time, as well as the time for the other crew members, is usually scheduled by someone else so there is not much freedom in the jobs.

The Electronic Warfare Officers have the lowest scores on the core dimensions Task Identity, Task Significance, and Feedback from the Job. These low scores on these variables imply that he does not experience any meaningfulness to his job. He cannot see a visible outcome of his job and he does not think that his job has a substantial impact on the lives of others.

These three variables create two of the critical

psychological states of the Job Characteristic Model of Work Motivation. According to the theory, these lead to beneficial personal and work outcomes. Since these conditions are present at low levels in the Electronic Warfare Officer's job, this condition could be part of the reason that these crew members are low in their satisfaction with the job and in the MPS scores.

In a peacetime situation where the flying training missions are against low level radar bombing sites, the Electronic Warfare Officer works with simulated threat radar signals. After the bomb run, he receives a score back from the site indicating the effectiveness of his jamming against the simulated signals. Those scores do not always reflect what the Electronic Warfare Officers actually did or thought he did during the run. The information obtained is not always direct and clear enough to give him the effective feedback he needs and desires.

If the average MPS for professionals is 167, as in the EEOC study, then the Navigators and Radar Navigators also need improvement in the core dimensions. Before any improvements are made in any of the jobs of the crew positions, the jobs need to be researched thoroughly to find the specific aspects of the job that are causing the difficulty.

Additional Findings

One of the specific goals stated in the objectives of this study in Chapter I was to attempt to relate career intent and OER ratings to job satisfaction for officers.

When a regression was run for officers, the variables that came in were Growth Satisfaction, explaining 65 percent of the variation in job satisfaction, and the variable Career Intentions, explaining another 5 percent. This is the same pattern as other regressions in the research. Career intent was then found to relate to job satisfaction for officers.

In this research, OER ratings were found to relate to job satisfaction, particularly for two crew positions, Navigators and Electronic Warfare Officers. From the job satisfaction equation for Navigators, a negative relationship was found between them and their OER rating, implying that poor OER ratings are related with lower job satisfaction.

The Electronic Warfare Officers surveyed had the poorest ratings of any of the other crew positions. This was brought out in the *t*-test done on the differences between means for the crew positions. Tables XXXIV and XXXV are taken from a printout from the SPSS subprogram CROSSTABS, which displays the percentages of self-reported ratings given to each crew position on their last OER. One hundred and eighty-seven officers responded to this question. With the quota system that is employed under the OER system, no more than 22 percent of the ratings can be one's, no more than 28 percent two's, and 50 percent can be three's or below. If this population contained ratings that reflected these percentages, there would be a maximum of 41 one's, 52 two's, and 93 three's for the overall officer population. Table XXXIV shows that in this sample

Table XXXIV
OER Rating by Crew Positions (N=187)

Crew Positions	1	2	3	4	Row Total
Pilot	7 14.3%	21 42.9%	20 40.8%	1 2.0%	49
Co-pilot	6 25.0%	10 41.7%	8 33.3%		24
Radar Navigator	11 26.2%	11 26.2%	20 47.6%		42
Navigator	5 18.5%	5 18.5%	16 59.3%	1 3.7%	27
Electronic Warfare Officer	1 2.2%	13 28.9%	31 68.9%		45
Column Total	30 16.0%	60 32.1%	95 50.8%	2 1.1%	187

Table XXXV
OER Rating by Crew Positions (Captains, N=122)

Crew Positions	1	2	3	4	Row Totals
Pilot	6 15.8%	14 36.8%	17 44.7%	1 2.6%	38
Co-pilot	4 30.8%	5 38.5%	4 30.8%		13
Radar Navigator	10 32.3%	10 32.3%	11 35.5%		31
Navigator	3 21.4%	1 7.1%	10 71.4%		14
Electronic Warfare Officer	1 3.8%	6 23.1%	19 73.1%		26
Column Total	24 19.7%	36 29.5%	61 50.0%	1 .8%	122

population 30 one's, 60 two's, and 95 three's were received from the final reviewer. The percentage of the population of crew members who are Captains reflect the quotas better. These are found in Table XXXV.

Some of the reasons that crew members are dissatisfied with their jobs could be due to their reaction to OER ratings. This is especially apparent for Electronic Warfare Officers, as indicated by Table XXXIV. They received only 1 one, 13 two's, and 31 three's. Table XXXVI shows the result of the last promotion board for Captains eligible for Major according to OER ratings from the Air Force Times.

Table XXXVI
O-4 Board/OER Results

	Total	'1' Rating	'2' Rating	'3' Rating	No Controlled Rating
Secondary Zone					
Selected	150	109	1	0	40
Considered	711	565	18	4	124
% Selected	21	19	6	0	32
All Primary Zone					
Selected	2858	1018	862	257	722
Considered	5045	1074	1165	1456	1326
% Selected	57	95	74	18	54
1st Time Eligibles					
Selected	2698	942	806	252	698
Considered	3759	959	960	855	973
% Selected	72	98	84	29	72
Previously Selected					
Selected	161	76	56	5	24
Considered	1286	115	205	601	353
% Selected	13	66	27	1	7

With the type of feedback given the crew members as shown in Table XXXVI, many officers, according to the Air Force Times "fear that a rating of '3' means they are unlikely to be promoted. The Air Force, pointing to statistics showing that some officers with '3's' have been promoted, argues that the '3' is not a bad rating" (Ewing, 1977:3). But if the OER is a key factor in promotions, and the crew members know that they have a "3" on their OER, this could affect their job satisfaction and motivation, even though the Air Force has said that the "3" can be competitive.

The problems of dissatisfaction and motivation among some of the crew positions found in this research bear out the conclusions of Keyserling (1976:vi). He thought that these problems could lead to a decrease in the Air Force mission effectiveness. For these reasons, the OER system is currently being reviewed for ways to revise it.

Summary

Final conclusions drawn from the findings presented in the two sections of this chapter will be discussed in Chapter V. This chapter was rather lengthy because the author thought much pertinent information could be gained from examining job satisfaction levels of the 7th BMW personnel by breaking the population down into squadrons and crew positions. It was hoped that this would give the right kind of information to squadron commanders and other supervisors to enable them to more effectively manage their people. By looking at the different crew positions and finding out where

the strengths and weaknesses lie, supervisors would have a basis from which to start if it were deemed necessary to change or improve the job to increase satisfaction and motivation among the crew members.

V. CONCLUSIONS AND RECOMMENDATIONS

The most significant conclusions in this research will be presented in this chapter as were formulated in Chapter IV. These conclusions will be divided between the four flying squadrons and the different crew positions. Recommendations will be made regarding any changes which, in the opinion of the author, could result in increased job satisfaction and motivation for the 7th BMW personnel.

The research hypothesis that the levels of job satisfaction differ among the four flying squadrons was found to be true only between the 4018 CCTS and the three tactical squadrons--the 7th ARS, the 9th BS, and the 20th BS. Factors affecting job satisfaction levels were found to differ mainly between the 4018 CCTS and the tactical squadrons, but significant differences were also found between the 7th ARS and the other two tactical squadrons. No significant differences were found between these two bomb squadrons--the 9th BS and the 20th BS--therefore, they can be treated as one group.

The 7th Air Refueling Squadron (ARS)

The most significant conclusions drawn from the 7th ARS were in the area of satisfaction with supervisors. This squadron had the highest mean scores in the variables Feedback from Agents, Supervisory Satisfaction, and Communication. The variable Supervisory Satisfaction also entered the job satisfaction regression equation. This implies that the 7th ARS personnel are very satisfied with their supervisors and the channels

of feedback that are opened up to them by the supervisors.

Many variables entered this unit's regression equation in comparison to the other squadrons. The most important one was Growth Satisfaction, indicating that most of the satisfaction with the job comes from growth characteristics of doing the job itself, not because of the objective characteristics of the job.

Other JDS variables that measure one's personal feelings about doing the work such as Internal Motivation, Social and Supervisory Satisfaction, also entered the regression equation. These variables indicate that 7th ARS personnel are self-motivated to perform effectively on their jobs and that they gain satisfaction from working with others, whether it be their peers or supervisors.

The one weak area brought out in the analysis is the core job dimension Autonomy. In a job where there are so many rules and regulations as in being combat ready crew members in the KC-135, it is hard for the job to provide substantial freedom and independence in scheduling the work or in determining the procedures used to carry out the work. One principle that can be used for increasing the core dimension Autonomy is called vertical loading. The intent here "is to practically close the gap between the 'doing' and the 'controlling' aspects of the job or giving some of the responsibilities and controls to the employees that were formerly reserved for management" (Hackman and Suttle, 1977:138).

For this rather rigid type of job, the only change that the author can recommend would be in the area of

scheduling, where the crews could have more control over the schedule of things such as alert cycles and leaves.

The 9th and 20th Bomb Squadrons

Both the 9th BS and the 20th BS were low on the Hoppock Measure (16.9 and 17.5) and on the MPS (93 and 98). No significant differences were found between any of the mean scores for these two squadrons. The mean scores for all of the core dimensions and most of the affective reactions to the job were significantly different from the 4018 CCTS.

These mean scores for the core dimensions were lower than for the 7th ARS and 4018 CCTS, especially on the core dimension Autonomy. On this core dimension, the only recommendation that can be made is to let the squadron personnel have more input into the area of scheduling, as was recommended for the 7th ARS.

If one agrees with the MPS model that the core dimension Feedback from the Job should have such an important multiplier effect, then channels of feedback need to be opened up to these personnel. This will help them learn how they are performing their jobs, whether their performance is improving, deteriorating, or staying the same. Feedback provided by the job itself is more immediate and private than that provided by supervisors. A recommendation in this area would be to have simulators for each crew specialty that give immediate feedback in the form of a CRT display or a printout, telling the individual that an error has been made.

Any improvement in the area of the core dimensions

can lead to a more motivated and satisfied crew member. As stated in the theory, a job high in motivational potential leads to positive work outcomes such as motivation and satisfaction.

One significant conclusion concerning the 9th BS is that they seem to be satisfying their need for growth satisfaction not in the job itself, but in furthering their education. This is indicated by their high mean score on the variable Educational Level.

The job satisfaction regression equations for these two groups showed that the variable Growth Satisfaction explained most of the variance. The variables Career Intentions and Dealing with Others also entered as found in other Air Force studies.

The 4018 Combat Crew Training Squadron (CCTS)

The 4018 CCTS was found to be a highly satisfied and motivated squadron in comparison to the three other tactical squadrons. It was highest on the Hoppock Measure of Job Satisfaction (20.5) and the MPS (172). Significant differences were found between the 4018 CCTS and the 9th BS and 20th BS on all of the core dimensions and with the 7th ARS on the dimension Autonomy. Also, differences were found on the variables that measured the affective reactions to the job.

All of the analysis conducted indicates that this squadron has a good combination of all the job characteristics and individual differences that interact to affect

the satisfaction, motivation, and productivity of its members. This is as proposed by Hackman and Oldham in their Job Characteristic Model of Work Motivation. There is no apparent need for any redesign of work in this squadron.

The regression analysis showed that the variable Social Satisfaction explained most of the variance of job satisfaction for the 4018 CCTS. The variables Task Significance and OER Index also entered the equation. These variables go along with the nature of the job at the 4018 CCTS. As instructors, these personnel get to work with and help many people. This instructor-student relationship gives them the opportunity to have a substantial impact on the lives of others. With the variable OER Index entering the regression, it can be concluded that the officers of the 4018 CCTS perceive their higher OER ratings as important enought to relate to their overall job satisfaction, as contrasted to the other units.

The Crew Positions

When the sample population was divided into the various crew positions, the most significant finding was that the Electronic Warfare Officers had the lowest mean scores on almost every variable measured. Other crew positions, particularly the Pilots and Gunners, seemed to be reasonably well satisfied and motivated in their jobs. The Co-pilots were low, as well as Electronic Warfare Officers, on the MPS. Radar Navigators and Navigators had moderate mean scores on the variables.

When the difference between the means was tested using the t-test, job satisfaction levels were found to differ between the Pilots and two other crew positions--the Navigators and the Electronic Warfare Officers. Mean differences were also found between Electronic Warfare Officers and the Radar Navigators and the Gunners. The research hypothesis that there were differences in job satisfaction levels proved correct between these crew positions.

Regression analysis showed that the variable Growth Satisfaction was the most important predictor for the crew positions. As in the case of the squadrons, the different crew specialties are not getting their satisfaction from the objective characteristics of the job or the core dimensions, but from their personal feelings about doing the job itself. An interesting finding in the regression equation was that Radar Navigators had a positive relationship with the 9th BS, while the Pilots had a negative one.

The variable Career Intentions was the second predictor of job satisfaction for the Navigators and Radar Navigators. For the Co-pilots, the variable Internal Motivation came into the regression equation, showing that these crew members are more self-motivated to do their job, instead of being motivated by other factors.

Even though Co-pilots seem to be well-rewarded for their job with the best OER rating, they still have a low score on the MPS. The reason for this is their low mean score on the core dimension Autonomy, which has a multiplier effect on the MPS. They were significantly different from

all other crew positions except the Electronic Warfare Officer on this dimension. The Co-pilot of a KC-135 or B-52D does not have much freedom or independence in his job. He has to be constantly at work doing such crew duties as making the radio calls and keeping a watch on fuel flow. Since he wants to be upgraded to aircraft commander, he performs a lot of the pilot's duties. Therefore, he has little time for any independent thought in his job. To increase this measure, he could be given more freedom in scheduling his work when not flying.

As stated previously, the Electronic Warfare Officers were low on most of the mean scores. Their means were significantly different from the other crew positions for most of the variables, especially as compared to Pilots. They had the worst OER ratings. As evidenced by the data analysis in Chapter IV, this crew position seems to be in serious trouble. This is further pointed out by the percentage of Electronic Warfare Officers who indicated on the career intent question that they were definitely not making a career out of the Air Force. These are people who the Air Force has spent a lot of time and money on and are important for the mission accomplishment of any B-52 mission. If this does not seem to be true for the everyday routine mission, the effectiveness of electronic countermeasures performed by Electronic Warfare Officers in the Vietnam War needs to be reviewed.

From talking to crews at Carswell, there seems to be

a lack of understanding of just what the Electronic Warfare Officer does. His job is not as visible to the other officer crew members on a B-52 as are the bomb scores for the Radar Navigator, the take-offs and landings for the Pilot and Co-pilot, and the navigation done by the Navigator. More communication from the Electronic Warfare Officer to the crew and more interest from the crew about the job is needed.

This analysis also indicates that the feedback that the Electronic Warfare Officer is getting all seems to be negative. This is especially true in the area of rewards for his performance on the job. For an Air Force officer, this comes in the form of the OER rating, which is a most important item at promotion time. By examining the last results of the Major's board, it is no wonder that the Electronic Warfare Officers seem to be the most dissatisfied group of the 7th BMW.

Overall Conclusions and Recommendations

Generally, the Job Diagnostic Survey was found to be a good instrument with which to measure satisfaction potential in a job and the dimensions that affect it. The author would recommend its use for other studies in the future. Its predictive and evaluative powers seem to be evident from the data analyses. The theory states that jobs high on the core dimensions and therefore having high MPS scores relate positively to a number of beneficial outcomes, such as employee satisfaction, motivation, and productivity. This was found to be true for those groups high on the MPS

score--the 4018 CCTS and the crew positions Pilot and Gunner.

The analysis also shows that the individuals surveyed perceived that the main part of their job satisfaction stems from their own personal feelings about doing the job itself and not from the objective characteristics of the job. Since the jobs performed by these crew members on the KC-135 and the B-52D are well-defined and not subject to change, any improvement in job satisfaction has to come through other areas, such as feedback from supervisors, security satisfaction, and through the rewards of the organization.

The most significant area of job dissatisfaction found among the 7th BMW personnel was in the Electronic Warfare Officer crew position. It is the hypothesis of the author that if things were improved here, the low satisfaction levels of the 9th BS and the 20th BS might also disappear.

It is recommended by the author that this survey be administered to 7th BMW personnel when the OER system is changed to see if there are any differences. Also, it is recommended that this survey be administered SAC-wide to examine the job satisfaction levels between the different bomb wings and the different crew positions.

BIBLIOGRAPHY

Barrett, Gerald, Faye H. Dambrot, and Gary R. Smith. The Relationship Between Individual Attributes and Job Design: Review and Annotated Bibliography. Akron, Ohio: The Department of Psychology, The University of Akron, August 1975.

Bartholomew, C. W. Personal Value Systems and Career Objectives of Men Vis a Vis Women Air Force Officers. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, December 1973.

Bishop, Ronald C. and James W. Hill. "Effects of Job Enlargement and Job Changes on Contiguous but Nonmanipulated Jobs as a Function of Workers' Status." Journal of Applied Psychology, 55: 175-181 (1971).

Draper, N. R. and H. Smith. Applied Regression Analysis. New York: John Wiley and Sons, Inc., 1966.

Ellis, R. W., General, USAF Vice Chief of Staff. Department of Defense Letter, dated 26 March 1975.

Ewing, Lee. "OER Scores Have Impact on O-4 Hikes." Air Force Times, 37: 3 (17 January 1977).

Hackman, J. R. and E. E. Lawler III. "Employee Reactions to Job Characteristics." Journal of Applied Psychology, 55: 259-286 (1971).

Hackman, J. Richard and Greg R. Oldham. The Job Diagnostic Survey: An Instrument for the Diagnosis of Jobs and the Evaluation of Job Redesign Projects. Technical Report No. 4. Yale University, New Haven, Connecticut: Department of Administrative Sciences, 1974a.

Hackman, J. Richard, Greg Oldham, Robert Janson, and Kenneth Purdy. A New Strategy for Job Enrichment. Technical Report No. 3. Yale University, New Haven, Connecticut: Department of Administrative Sciences, 1974b.

Hackman, J. Richard and Greg R. Oldham. Motivation Through the Design of Work: Test of a Theory. Technical Report No. 6. Yale University, New Haven, Connecticut: Department of Administrative Sciences, 1974c.

Hackman, J. Richard and J. Floyd Suttle, eds. Improving Life at Work: Behavioral Science Approaches to Organizational Change. Santa Monica, California: Goodyear Publishing Company, Inc., 1977.

Herzberg, Frederick. "One More Time: How Do You Motivate Employees?" Harvard Business Review, 46: 53-62 (January-February 1968).

Hullin, Charles T. and T. K. Waters. "Regression Analysis of Three Variations of the Two-Factor Theory of Job Satisfaction." Journal of Applied Psychology, 55: 211-217 (1971).

Keyserling, Steven. Junior Officer Perceptions of the OER System. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, December 1976.

Madia, J. A. A Study of the Personal Value Systems and Job Satisfaction of the United States Air Force Officers. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, October 1974.

Manley, T. R., et al., The Reliability and Validity of Hoppock's Job Satisfaction Measure. Unpublished manuscript. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, 1976.

Maslow, Abraham H. Motivation and Personality. New York: Harper and Bros., 1954.

Nie, Norman H., C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner, and Dale H. Bent. SPSS: Statistical Package for the Social Sciences. Second Edition. New York: McGraw-Hill Book Company, 1975.

Oldham, Greg R., J. Richard Hackman, and Jone L. Pearce. Conditions Under Which Employees Respond Positively to Enriched Work. Technical Report No. 10. Yale University, New Haven, Connecticut: Department of Administrative Sciences, September 1975.

Patterson, James W. Career Intent and Job Satisfaction of First Term Personnel. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, December 1977.

Porter, Lyman W., Edward E. Lawler III, and J. Richard Hackman. Behavior in Organizations. New York: McGraw-Hill Bock Company, 1975.

Rigsbee, David M. and Charles T. Roof. A Study of Job Satisfaction as it Relates to the System Program Office and the Weapon Acquisition Process. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, August 1975.

Smith, Dale M. "Job Design: From Research to Application." Industrial Engineering, 19: 477-482 (1968).

Taylor, Frederick W. Principles of Scientific Management. New York: Harper and Bros., 1911.

Thompson, Thomas N. A Study of Job Satisfaction in the United States Air Force. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, October 1975.

Turner, Arthur N. and Paul R. Lawrence. Industrial Jobs and the Worker. Boston: Harvard University Graduate School of Business Administration, 1965.

Vrooman, Roger M. An Analysis of Factors Associated with the Job Satisfaction and Career Intent of Air Force Personnel with Less Than Six Years of Service. Unpublished Thesis. Wright-Patterson Air Force Base, Ohio: Air Force Institute of Technology, December 1976.

APPENDIX A

THE QUESTIONNAIRE

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO ATTN OF: ENS (Capt Krebs) 6 Jun 77

SUBJECT: Job Satisfaction Questionnaire (USAF SCN 77-121, Expires 30 Sep 77)

TO: Personnel of the 7th Bomb Wing

1. Attached is a questionnaire designed to assist in the study of your job and to show how it affects you. The survey data will help to determine how jobs can be better designed, by obtaining information about how people react to different kinds of jobs. Only the researcher will have access to the completed questionnaires.

2. On the following pages, you will find several different kinds of questions about your job. Specific instructions are given at the start of each section. Please read them carefully. It should take no more than 20 minutes to complete the entire questionnaire.

> The questions are designed to measure your perceptions of your job and <u>your</u> reaction to it. Please answer each item as honestly and frankly as possible. Your individual answers will be held in the strictest confidence.

3. Being a former crew member of both the 20th BS and the 4018 CCTS, I am quite familiar with your jobs. My thanks go to Colonel Todd for his allowing me to conduct this survey. I sincerely appreciate your completion of the questionnaire. Thank you for your cooperation and participation.

Alvin E. Krebs Jr.

ALVIN E. KREBS, Jr., Capt, USAF
Student, Air Force Institute of Technology
Department of Systems Management
Wright-Pattterson AFB, OH 45433

PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

(1) DOD Instruction 1100.13, 17 Apr 1968, Surveys of Department of Defense Personnel; and/or

(2) AFR 178-9, 9 Oct 1973, Air Force Military Survey Program; and/or

(3) 5 U.S.C. 301 and 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation.

b. Principle purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

USAF SCN 77-121
Expires 30 Sep 77

SECTION ONE

This part of the questionnaire asks you to describe your job, as objectively as you can.

Please do not use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

A sample question is given below.

A. TO WHAT EXTENT DOES YOUR JOB REQUIRE YOU TO WORK WITH MECHANICAL EQUIPMENT?

1.....2.....3.....4.....5.....(6).....7

Very little; the job requires almost no contact with mechanical equipment of any kind.	Moderately	Very much; the job requires almost constant work with mechanical equipment.

NOTE: You are to circle the number which is the most accurate description or your job.

If, for example, your job requires you to work with mechanical equipment a good deal of the time--but also requires some paperwork--you might circle the number six, as was done in the example above.

1. TO WHAT EXTENT DOES YOUR JOB REQUIRE YOU TO WORK CLOSELY WITH OTHER PEOPLE (EITHER "CLIENTS," OR PEOPLE IN RELATED JOBS IN YOUR OWN ORGANIZATION)?

1.....2.....3.....4.....5.....6.....7

Very little; dealing with other people is not at all necessary in doing the job.	Moderately; some dealing with others is necessary	Very much; dealing with other people is an absolutely essential part of doing the job.

2. HOW MUCH AUTONOMY IS THERE IN YOUR JOB? THAT IS, TO WHAT EXTENT DOES YOUR JOB PERMIT YOU TO DECIDE ON YOUR OWN HOW TO GO ABOUT DOING THE WORK?

1.....2.....3.....4.....5.....6.....7

Very little; the job gives me almost no personal "say" about how and when the work is done.	Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work.	Very much; the job gives me almost complete responsibility for deciding how and when the work is done.

3. TO WHAT EXTENT DOES YOUR JOB INVOLVE DOING A "WHOLE" AND IDENTIFIABLE PIECE OF WORK? THAT IS, IS THE JOB A COMPLETE PIECE OF WORK THAT HAS AN OBVIOUS BEGINNING AND END? OR IS IT ONLY A SMALL PART OF THE OVERALL PIECE OF WORK, WHICH IS FINISHED BY OTHER PEOPLE OR BY AUTOMATIC MACHINES?

1.....2.....3.....4.....5.....6.....7

My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service.	My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome.	My job involves doing the whole piece of work, from start to finish; the results of my activities are easily seen in the final product or service.

4. HOW MUCH VARIETY IS THERE IN YOUR JOB? THAT IS, TO WHAT EXTENT DOES THE JOB REQUIRE YOU TO DO MANY DIFFERENT THINGS AT WORK, USING A VARIETY OF YOUR SKILLS AND TALENTS?

1.....2.....3.....4.....5.....6.....7

Very little; the job requires me to do the same routine things over and over again.	Moderate variety.	Very much; the job requires me to do many different things, using a number of different skills and talents.

5. IN GENERAL, HOW SIGNIFICANT OR IMPORTANT IS YOU JOB? THAT IS, ARE THE RESULTS OF YOUR WORK LIKELY TO SIGNIFICANTLY AFFECT THE LIVES OR WELL-BEING OF OTHER PEOPLE?

1.....2.....3.....4.....5.....6.....7

Not very significant; the outcomes of my work are not likely to have important effects on other people.	Moderately significant.	Highly significant; the outcomes of my work can affect other people in very important ways.

6. TO WHAT EXTENT DO MANAGERS OR CO-WORKERS LET YOU KNOW HOW WELL YOU ARE DOING ON YOUR JOB?

1.....2.....3.....4.....5.....6.....7

Very little; people almost never let me know how well I am doing.	Moderately; Sometimes people may give me "feedback;" other times they may not.	Very much; managers or co-workers provide me with almost constant "feedback" about how well I am doing.

7. TO WHAT EXTENT DOES DOING THE JOB ITSELF PROVIDE YOU WITH INFORMATION ABOUT YOUR WORK PERFORMANCE? THAT IS, DOES THE ACTUAL WORK ITSELF PROVIDE CLUES ABOUT HOW WELL YOU ARE DOING--ASIDE FROM ANY "FEEDBACK" CO-WORKERS OR SUPERVISORS MAY PROVIDE?

1.....2.....3.....4.....5.....6.....7

Very little; the job itself is set up so I could work forever without finding out how well I am doing.	Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not.	Very much; the job is set up so that I get almost constant "feedback" as I work about how well I am doing.

SECTION TWO

Listed below are a number of statements which could be used to describe a job.

You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Once again, please try to be as objective as you can in deciding how accurately each statement describes your job--regardless of whether you like or dislike your job.

Write a number in the blank beside each statement, based on the following scale:

HOW ACCURATE IS THE STATEMENT IN DESCRIBING YOUR JOB?

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

____1. The job requires me to use a number of complex or high-level skills.

____2. The job requires a lot of cooperative work with other people.

____3. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.

____4. Just doing the work required by the job provides many chances for me to figure out how well I am doing.

____5. The job is quite simple and repetitive.

____6. The job can be done adequately by a person working alone--without talking or checking with other people.

____7. The supervisors and co-workers on this job almost never give me any "feedback" about how well I am doing in my work.

____8. This job is one where a lot of other people can be affected by how well the work gets done.

____9. The job denies me any chance to use my personal initiative or judgment in carrying out the work.

___10. Supervisors often let me know how well they think I am performing the job.

HOW ACCURATE IS THE STATEMENT IN DESCRIBING YOU JOB?

1.....2.....3.....4.....5.....6.....7

Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

____11. The job provides me the chance to completely finish the pieces of work I begin.

____12. The job itself provides very few clues about whether or not I am performing well.

____13. The job gives me considerable opportunity for independence and freedom in how I do the work.

____14. The job itself is <u>not</u> very significant or important in the broader scheme of things.

____15. There is good rapport between superiors and the subordinates in this organization.

____16. When there is personal conflict in the organization, those involved openly discuss the problem.

____17. My immediate supervisor communicates often with me.

____18. For every situation there is an appropriate regulation.

____19. I am encouraged to be innovative in the performance of my tasks.

____20. My supervisor provides me with adequate information to perform my job in the best manner.

____21. Rewards and encouragement outweigh threats and criticism.

____22. The working environment is relaxed.

____23. The chain of command is strictly enforced.

____24. It is hard to get people higher up in this organization to listen to people at my level.

____25. I am encouraged to say what I <u>really</u> think.

____26. Strict obedience of orders is important here.

____27. Relations between different levels of organization are informal.

SECTION THREE

Now please indicate how you personally feel about your job.

Each of the statements below is something that a person might say about his or her job. You are to indicate your own, personal feelings about your job by marking how much you agree with each of the statements.

Write a number in the blank for each statement, based on this scale:

HOW MUCH DO YOU AGREE WITH THE STATEMENT?

1	2	3	4	5	6	7
Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly

____1. My opinion of myself goes up when I do this job well.

____2. Generally speaking, I am very satisfied with this job.

____3. I feel a great sense of personal satisfaction when I do this job well.

____4. I frequently think of quitting this job.

____5. I feel bad and unhappy when I discover that I have performed poorly on this job.

____6. I am generally satisfied with the kind of work I do in this job.

____7. My own feelings generally are not affected much one way or the other by how well I do on this job.

____8. In this organization people are rewarded in proportion to the excellence of their performance.

____9. There is a great deal of criticism in this organization.

___10. There are not enough rewards or recognition given in this organization for doing good work.

SECTION FOUR

Now please indicate how satisfied you are with each aspect of your job listed below. Once again, write the appropriate number in the blank beside each statement.

HOW SATISFIED ARE YOU WITH THIS ASPECT OF YOUR JOB?

1.....2.....3.....4.....5.....6.....7

Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied

___1. The amount of personal growth and development I get in doing my job.

___2. The people I talk to and work with on my job.

___3. The degree of respect and fair treatment I receive from my boss.

___4. The feeling of worthwhile accomplishment I get from doing my job.

___5. The chance to get to know other people while on the job.

___6. The amount of support and guidance I receive from my supervisor.

___7. The amount of independent thought and action I can exercise in my job.

___8. The chance to help other people while at work.

___9. The amount of challenge in my job.

___10. The overall quality of the supervision I receive in my work.

___11. The amount of job security I have.

___12. The amount of pay and fringe benefits I receive.

___13. The degree to which I am fairly paid for what I contribute to this organization.

___14. How secure things look for me in the future in this organization.

SECTION FIVE

Listed below are a number of characteristics which could be present on any job. People differ about how much they would like to have each one present in their own jobs. We are interested in learning how much you personally would like to have each one present in your job.

Using the scale below, please indicate the degree to which you would like to have each characteristic present in your job.

NOTE: The numbers on this scale are different from those used in previous scales.

4 ..... 5 ..... 6 ..... 7 ..... 8 ..... 9 10

Would like having this only a moderate amount (or less)	Would like having this very much	Would like having this extremely much

___1. High respect and fair treatment from my supervisor.

___2. Stimulating and challenging work.

___3. Chances to exercise independent thought and action in my job.

___4. Great job security.

___5. Very friendly co-workers.

___6. Opportunities to learn new things from my work.

___7. High salary and good fringe benefits.

___8. Opportunities to be creative and imaginative in my work.

___9. Quick promotions.

___10. Opportunities for personal growth and development in my job.

___11. A sense of worthwhile accomplishment in my work.

SECTION SIX

For the following questions choose the response that best reflects your feeling about your job. Circle the number that most accurately reflects your feelings.

1. WHICH ONE OF THE FOLLOWING SHOWS HOW MUCH OF THE TIME YOU FEEL SATISFIED WITH YOUR JOB?

   1. All the time.
   2. Most of the time.
   3. A good deal of the time.
   4. About half of the time.
   5. Occasionally.
   6. Seldom.
   7. Never.

2. CHOOSE THE ONE OF THE FOLLOWING STATEMENTS WHICH BEST TELLS HOW WELL YOU LIKE YOUR JOB.

   1. I hate it.
   2. I dislike it.
   3. I don't like it.
   4. I am indifferent to it.
   5. I like it.
   6. I am enthusiastic about it.
   7. I love it.

3. WHICH ONE OF THE FOLLOWING BEST TELLS HOW YOU FEEL ABOUT CHANGING YOUR JOB?

   1. I would quit this job at once if I could.
   2. I would take almost any other job in which I could earn as much as I am earning now.
   3. I would like to change both my job and my occupation.
   4. I would like to exchange my present job for another one.
   5. I am not eager to change my job, but I would do so if I could get a better job.
   6. I cannot think of any jobs for which I would exchange.
   7. I would not exchange my job for any other.

4. WHICH ONE OF THE FOLLOWING SHOWS HOW YOU THINK YOU COMPARE WITH OTHER PEOPLE?

   1. No one likes his job better than I like mine.
   2. I like my job much better than most people like theirs.
   3. I like my job better than most people like theirs.
   4. I like my job about as well as most people like theirs.
   5. I dislike my job more than most people dislike theirs.
   6. I dislike my job much more than most people dislike theirs.
   7. No one dislikes his job more than I dislike mine.

SECTION SEVEN

Biographical Background

Instructions: Please circle the appropriate letter or fill in the blanks.

1. What is your present grade? (Circle one)

(A) E-1	(E) E-5	(I) E-9	(M) O-4
(B) E-2	(F) E-6	(J) O-1	(N) O-5
(C) E-3	(G) E-7	(K) O-2	
(D) E-4	(H) E-8	(L) O-3	

2. What is your age?

_____

3. What is your marital status? (Check one)

_____Married _____Not Married

4. What is your current squadron assignment? (Check one)

_____A. 7th ARS
_____B. 20th BS
_____C. 9th BS
_____D. 4018th CCTS

5. How long have you been in your current organization? (Circle one)

(A) Less than 1 year
(B) 1 year
(C) 2 years
(D) 3 years
(E) 4 years
(F) 5 or more years

6. What is your crew position? (Circle one)

(A) P	(E) EW
(B) CP	(F) G
(C) NB	(G) BO
(D) N	

7. Are you a/an: (Circle one)

(A) Regular crew member
(B) Instructor crew member
(C) Standboard crew member
(D) Academic team member

8. What is your education level? (Circle one)

(A) Less than high school graduate.
(B) High school graduate or equivalent.
(C) Some college or technical school.
(D) College degree (BS, BA, or equivalent).
(E) Graduate work beyond bachelor degree (no master's degree).
(F) Master degree.
(G) Graduate work beyond master degree.
(H) Doctorate degree

9. Which of the following best describes your attitude toward making the Air Force a career? (Circle one)

(A) Definitely will not make the Air Force a career.
(B) Probably will not make the Air Force a career.
(C) Undecided.
(D) Probably will make the Air Force a career.
(E) Definitely will make the Air Force a career.

10. How much total active federal military service have you completed?

_____Years

THE FOLLOWING QUESTIONS PERTAIN TO OFFICERS ONLY.

11. What is your source of commission? (Circle one)

(A) OTS
(B) ROTC
(C) Air Force Academy
(D) Other (Specify_____)

12. Have you been evaluated under the new OER System?

_____A. Yes _____B. No

13. If you have been evaluated under the new OER System, please circle the code for the reviewer's rating you received.

(A) 1
(B) 2
(C) 3
(D) 4 or lower

14. Please circle the code for the reviewer's rating on your second to the last OER.

(A) Not rated
(B) 1
(C) 2
(D) 3
(E) 4 or lower

THANK YOU VERY MUCH FOR ANSWERING THE QUESTIONS AND IN FILLING OUT THE SURVEY.

APPENDIX B

SCORING KEY FOR THE SHORT FORM OF THE JDS

APPENDIX B

SCORING KEY FOR THE SHORT FORM OF THE JOB DIAGNOSTIC SURVEY

The Short Form of the Job Diagnostic Survey (JDS) measures several characteristics of jobs, the reactions of the respondents to their jobs, and the growth need strength of the respondents. Some of the scales tapped by the JDS are not included in the Short Form; others are measured with fewer items. The scales measuring the objective job dimensions are, however, identical with those in the JDS.

Each variable measured by the JDS Short Form is listed below, along with (a) a one or two sentence description of the variable, and (b) a list of the questionnaire items which are averaged to yield a summary score for the variable.

For further information about the instrument and its uses, contact:

Prof. J. Richard Hackman
56 Hillhouse Avenue
Yale University
New Haven, CT 06520

or

Prof. Greg R. Oldham
Deparment of Business Admin.
University of Illinois
Urbana, Ill. 61801

I. JOB DIMENSIONS: Objective characteristics of the job itself.

A. Skill Variety: The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the employee.

Average the following items:

Section One #4
Section Two #1
#5 (reversed scoring--i.e., subtract the number entered by the respondent from 8)

B. Task Identity: The degree to which the job requires the completion of a "whole" and identifiable piece of work--i.e., doing a job from beginning to end with a visible outcome.

Average the following items:

Section One #3
Section Two #11
#3 (reversed scoring)

C. Task Significance: The degree to which the job has a substantial impact on the lives or work of other people--whether in the immediate organization or in the external environment.

Average the following items:

Section One #5
Section Two #8
#14 (reversed scoring)

D. Autonomy: The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling his work and in determining the procedures to be used in carrying it out.

Average the following items:

Section One #2
Section Two #13
#9 (reversed scoring)

E. Feedback from the Job Itself: The degree to which carrying out the work activities required by the job results in the employee obtaining information about the effectiveness of his or her performance.

Average the following items:

Section One #7
Section Two #4
#12 (reversed scoring)

F. Feedback from Agents: The degree to which the employee receives information about his or her performance effectiveness from supervisors or from co-workers. (This construct is not a job characteristic per se, and is included only to provide information supplementary to construct (E) above.)

Average the following items:

Section One #6
Section Two #10
#7 (reversed scoring)

G. Dealing with Others: The degree to which the job required the employee to work closely with other people (whether other organization members or organizational "clients").

Average the following items:

Section One #1
Section Two #2
#6 (reversed scoring)

II. AFFECTIVE RESPONSES TO THE JOB: The private, affective reactions or feelings an employee gets from working on his job.

A. General Satisfaction: An overall measure of the degree to which the employee is satisfied and happy in his or her work.

Average the following items from Section Three:
#2
#6
#4 (reversed scoring)

B. Internal Work Motivation: The degree to which the employee is self-motivated to perform effectively on the job.

Average the following items from Section Three:
#1
#3
#5
#7 (reversed scoring)

C. Specific Satisfactions: These short scales tap several specific aspects of the employee's job satisfaction.

C1. "Pay" satisfaction. Average items 12 and 13 of Section Four.
C2. "Security" satisfaction. Average items 14 and 11 of Section Four.
C3. "Social" satisfaction. Average items 2, 5, and 8 of Section Four.
C4. "Supervisory" satisfaction. Average items 3, 6, and 10 of Section Four.
C5. "Growth" satisfaction. Average items 1, 4, 7, and 9 of Section Four.

III. INDIVIDUAL GROWTH NEED STRENGTH: This scale taps the degree to which an employee has strong vs. weak desire to obtain "growth" satisfactions from his or her work.

> Average the six items from Section Five listed below. Before averaging, subtract 3 from each item score; this will result in a summary scale ranging from one to seven. The items are: #2, #3, #6, #8, #10, #11.

IV. MOTIVATING POTENTIAL SCORE: A score reflecting the potential of a job for eliciting positive internal work motivation on the part of employees (especially those with high desire for growth need satisfaction) is given below.

$$\text{Motivating Potential Score (MPS)} = \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Feedback from the Job}$$

APPENDIX C

RESULTS OF HACKMAN AND OLDHAM STUDY

Table XXXVII

Demographic Characteristics of the Sample

	N	Percent
SEX		
Male	386	59
Female	272	41
AGE		
Under 20	60	9
20-29	282	43
30-39	175	27
40-49	65	10
50-59	62	9
60 and over	12	2
EDUCATION		
Grade school	7	1
Some high school	40	6
High school degree	221	34
Some business college or technical school	76	12
Some college experience (other than business or technical)	151	23
Business college or technical school degree	22	3
College degree	90	14
Some graduate work	24	4
Master's or higher degree	26	4
LOCATION OF PLACE OF WORK		
Urban	355	54
Suburban	46	7
Rural	255	39
LOCATION OF RESIDENCE		
Urban	194	30
Suburban	288	44
Rural	172	26
LOCATION OF CHILDHOOD HOME		
Urban	207	32
Suburban	217	33
Rural	230	35

Table XXXVIII

Reliabilities of the JDS Scales

	Internal Consistency Reliability	Median Off-diagonal Correlation[a]
JOB DIMENSIONS		
Skill Variety	.71	.19
Task Identity	.59	.12
Task Significance	.66	.14
Autonomy	.66	.19
Feedback from the Job Itself	.71	.19
Feedback from Agents	.78	.15
Dealing with Others	.59	.15
PSYCHOLOGICAL STATES		
Experienced Meaningfulness of the Work	.74	.26
Experienced Responsibility for the Work	.72	.23
Knowledge of Results	.76	.17
AFFECTIVE RESPONSES TO THE JOB		
General Satisfaction	.76	.25
Internal Work Motivation	.76	.25
Specific Satisfactions:		
Job Security	b	b
Pay	b	b
Social	.56	.23
Supervisory	.79	.25
Growth	.84	.28
GROWTH NEED STRENGTH		
"Would Like" Format	.88	c
Job Choice Format	.71	c

Notes:

a. The median off-diagonal correlation is the median correlation of the items scored on a given scale with all of the items scored on different scales of the same type. Thus, the median off-diagonal correlation for skill variety (.19) is the median correlation of all items measuring skill variety with all the items measuring the other six job dimensions.

b. These scales were added to the JDS after the present data were collected, and no reliability data are yet available.

c. Off-diagonal correlations are not reported for these two scales, since all items were designed to tap the same construct. The scale scores obtained using the "would like" format correlate .50 with the scale scores obtained using the job choice format.

Table XXXIX

Means and Variances of JDS Scores

	Total Sample		Analysis of Variance Across Jobs			
	$\bar{x}$	S.D.	$\bar{x}$	S^2 within Jobs	S^2 between Jobs	F-ratio
JOB DIMENSIONS						
Skill Variety	4.49	1.67	4.47	1.54	17.70	11.49
Task Identity	4.87	1.43	4.87	1.71	5.90	3.45
Task Significance	5.49	1.29	5.54	1.55	3.22	2.08
Autonomy	4.80	1.43	4.75	1.55	7.92	5.11
Feedback from the Job Itself	4.98	1.41	4.96	1.76	4.41	2.51
Feedback from Agents	3.98	1.65	3.87	2.28	6.82	2.99
Dealing with Others	5.29	1.34	5.27	1.35	6.70	4.96
Motivating Potential Score (MPS)	128.31	72.73	120.68	4112.	19959.	4.85
PSYCHOLOGICAL STATES						
Experienced Meaningfulness of the Work	5.12	1.10	5.06	1.05	3.19	3.04
Experienced Responsibility for the Work	5.48	0.91	5.44	0.70	2.37	2.24
Knowledge of Results	5.18	1.09	5.19	1.06	2.57	2.42

Table XXXIX(continued)

	Total Sample		Analysis of Variance Across Jobs			
	$\bar{x}$	S.D.	$\bar{x}$	S^2 within Jobs	S^2 between Jobs	F-ratio
AFFECTIVE RESPONSES TO THE JOB						
General Satisfaction	4.62	1.18	4.57	1.13	4.19	3.71
Internal Work Motivation	5.39	0.96	5.34	0.82	2.19	2.67
Specific Satisfactions:						
Job Security	a	a	a	a	a	
Pay	a	a	a	a	a	
Social	5.42	0.92	5.42	0.77	1.72	2.23
Supervisory	5.28	1.27	5.32	1.42	3.81	2.68
Growth	4.82	1.32	4.77	1.48	4.64	3.14
GROWTH NEED STRENGTH						
"Would Like" Format	5.62	1.28	5.51	1.30	5.11	3.93
Job Choice Format	b	b	b	b	b	b
N	658		62	c	c	c

Notes:

a. These scales were added to the JDS after the present data were collected, and normative data are not yet available.

b. The response scale for the job choice format was revised from seven to five points after these data were collected. Preliminary indications are that the mean of the five-point scale will be close to the midpoint (3.0).

c. The analysis of variance was conducted on 50 jobs which had five or more respondents. df=49, 563. All F-rations are significant beyond the .01 level.

Table XL

Intercorrelations Among JDS Scale Scores (Across 658 Respondents)

		1	2	3	4	5	6	7	8	9
1	Skill Variety	--								
2	Task Identity	.16	--							
3	Task Significance	.21	.20	--						
4	Autonomy	.51	.38	.22	--					
5	Feedback from the Job Itself	.32	.26	.26	.34	--				
6	Feedback from Agents	.25	.16	.22	.23	.37	--			
7	Dealing with Others	.46	.02	.24	.29	.24	.26	--		
8	Motivating Potential Score (MPS)	.62	.51	.41	.80	.72	.36	.34	--	
9	Experienced Meaningfulness of the Work	.51	.26	.43	.46	.41	.31	.33	.57	--
10	Experienced Responsibility for the Work	.40	.34	.34	.41	.37	.23	.24	.53	.64
11	Knowledge of Results	.12	.21	.21	.26	.54	.39	.06	.43	.33
12	General Satisfaction	.42	.22	.24	.43	.37	.33	.24	.49	.66
13	Internal Work Motivation	.42	.22	.32	.33	.36	.25	.30	.40	.63
14	Social Satisfaction	.31	.17	.24	.38	.27	.31	.36	.40	.41
15	Supervisory Satisfaction	.15.	16	.16	.32	.31	.41	.13	.35	.39
16	Growth Satisfaction	.52	.31	.33	.58	.44	.39	.28	.63	.68
17	Growth Need Strength (would like format)	.22	.08	.03	.10	.11	.13	.16	.19	.10
18	Growth Need Strength (job choice format)	.31	.06	-.01	.19	.13	.15	.20	.25	.15

Table XL (Continued)

		10	11	12	13	14	15	16	17	18
1	Skill Variety									
2	Task Identity									
3	Task Significance									
4	Autonomy									
5	Feedback from the Job Itself									
6	Feedback from Agents									
7	Dealing With Others									
8	Motivating Potential Score (MPS)									
9	Experienced Meaningfulness of the Work									
10	Experienced Responsibility for the Work	--								
11	Knowledge of Results	.32	--							
12	General Satisfaction	.48	.34	--						
13	Internal Work Motivation	.66	.25	.51	--					
14	Social Satisfaction	.38	.32	.40	.40	--				
15	Supervisory Satisfaction	.32	.37	.46	.31	.37	--			
16	Growth Satisfaction	.54	.36	.67	.56	.52	.47	--		
17	Growth Need Strength (would like format)	.21	.07	.04	.19	.08	.07	.02	--	
18	Growth Need Strength (job choice format)	.21	.05	.13	.17	.10	.10	.08	.50	--

Note: $\underline{N}$ = 658. Correlations $>$.10 are significant at the .01 level (two-tailed).

Table XLI

Intercorrelations Among JDS Scale Scores (Across 62 Jobs)

		1	2	3	4	5	6	7	8	9
1	Skill Variety	--								
2	Task Identity	.20	--							
3	Task Significance	.23	.33	--						
4	Autonomy	.64	.40	.06	--					
5	Feedback from the Job Itself	.43	.37	.36	.46	--				
6	Feedback from Agents	.12	.32	-.01	.25	.24	--			
7	Dealing with Others	.61	-.04	.11	.44	.37	.21	--		
8	Motivating Potential Score (MPS)	.76	.55	.37	.86	.76	.30	.49	--	
9	Experienced Meaningfulness of the Work	.64	.31	.46	.49	.47	.10	.31	.66	--
10	Experienced Responsibility for the Work	.58	.58	.47	.58	.53	.26	.35	.74	.64
11	Knowledge of Results	.06	.16	.34	.30	.57	.27	.10	.40	.29
12	General Satisfaction	.54	.38	.21	.57	.52	.27	.32	.67	.54
13	Internal Motivation	.52	.36	.39	.41	.65	.11	.29	.66	.65
14	Social Satisfaction	.35	.10	.26	.37	.42	.16	.63	.45	.35
15	Supervisory Satisfaction	.15	.20	.29	.31	.43	.42	.16	.40	.33
16	Growth Satisfaction	.65	.43	.39	.76	.63	.36	.48	.85	.63
17	Growth Need Strength (would like format)	.43	.37	.10	.43	.40	.47	.26	.53	.40
18	Growth Need Strength (job choice format)	.54	.34	.14	.47	.37	.40	.43	.58	.32

Table XLI (continued)

		10	11	12	13	14	15	16	17	18
1	Skill Variety									
2	Task Identity									
3	Task Significance									
4	Autonomy									
5	Feedback from the Job Itself									
6	Feedback from Agents									
7	Dealing with Others									
8	Motivating Potential Score (MPS)									
9	Experienced Meaningfulness of the Work									
10	Experienced Responsibility for the Work	--								
11	Knowledge of Results	.30	--							
12	General Satisfaction	.68	.35	--						
13	Internal Motivation	.77	.32	.71	--					
14	Social Satisfaction	.45	.44	.35	.35	--				
15	Supervisory Satisfaction	.42	.61	.57	.43	.38	--			
16	Growth Satisfaction	.77	.46	.74	.66	.60	.55	--		
17	Growth Need Strength (would like format)	.55	.23	.57	.51	.23	.39	.39	--	
18	Growth Need Strength (job choice format)	.57	.06	.51	.49	.26	.29	.39	.80	--

Note: N = 62. Correlations >.32 are significant at the .01 level (two-tailed).

APPENDIX D

SUPPLEMENTAL INFORMATION

This appendix contains the computer program used and some FREQUENCIES results for the entire sample and the squadrons. Pages 160-163 contain the computer program, pages 164-165 the entire sample, pages 166-168 the 7th ARS, pages 169-171 the 9th BS, pages 172-175 the 20th BS, and pages 176-177 the 4018 CCTS.

```
RUN NAME        ANANLYSIS OF JOB SATISFACTION
PRINT BACK      CONTROL
VARIABLE LIST   SI1 TO SI7,SII1 TO SII27,SIII1 TO SIII10,SIV1 TO SIV14,SV1 TO
                SV11,H1,H2,H3,H4,RANK,AGE,MS,SQUAD,TIME,POS,TYPE,EDUC,CARINT,SCV,
                COMM,OER,OER1,OER2
INPUT FORMAT    FIXED(58F1.0,11F2.0/4F1.0,2F2.0,7F1.0,1F2.0,4F1.0)
INPUT MEDIUM    CARD
N OF CASES      245
VAR LABELS      MS,MARITAL STATUS/SQUAD,CURRENT SQUADRON ASSIGNMENT/TIME,AMOUNT O
                F TIME IN CURRENT ORGANIZATION/POS,CREW POSITION/TYPE,TYPE OF CRE
                W MEMBER/EDUC,EDUCATION LEVEL/CARINT,AIR FORCE CAREER INTENTIONS/
                SCV,FEDERAL MILITARY SERVICE/COMM,SOURCE OF COMMISION
VALUE LABELS    RANK (1)E-1 (2)E-2 (3)E-3 (4)E-4 (5)E-5 (6)E-6 (7)E-7 (8)E-8
                (9)E-9 (10)O-1 (11)O-2 (12)O-3 (13)O-4 (14)O-5/SQUAD (1)7TH ARS
                (2)20TH BS (3)9TH BS (4)4018TH CCTS (5)7TH BMW/TIME (1) LESS 1YR
                (2)1YR (3)2YRS (4)3YRS (5)4YRS (6)5 OR MORE YRS/POS (1)PILOT
                (2)CO-PILOT (3)RADAR NAVIGATOR (4)NAVIGATOR (5)ELECTRONIC WARFARE
                 OFFICER (6)GUNNER (7)BOOM OPERATOR/TYPE (1)REGULAR (2)INSTRUCTOR
                (3)STANDBOARD (4)ACADEMIC/EDUC (1)LESS HIGH SCHOOL (2)HIGH SCHOOL
                (3)SOME COLLEGE (4)COLLEGE DEGREE (5)SOME GRADUATE WORK
                (6)MASTERS DEGREE (7)BEYOND MASTERS (8)DOCTORATE DEGREE/
                CARINT (1)DEFINITELY WILL NOT (2)PROBABLY WILL NOT (3)UNDECIDED
                (4)PROBABLY WILL (5)DEFINITELY WILL/COMM (1)OTS (2)ROTC (3)AIR FO
                RCE ACADEMY (4)OTHER
COMPUTE         SKILL=(SI4+SII1+(8.0-SII5))/3.0
COMPUTE         TASKID=(SI3+SII11+(8.0-SII3))/3.0
COMPUTE         TASKSIG=(SI5+SII8+(8.0-SII14))/3.0
COMPUTE         AUTO=(SI2+SII13+(8.0-SII9))/3.0
COMPUTE         FEEDJOB=(SI7+SII4+(8.0-SII12))/3.0
COMPUTE         FEEDSUP=(SI6+SII10+(8.0-SII7))/3.0
COMPUTE         ASSOC=(SI1+SII2+(8.0-SII6))/3.0
COMPUTE         JOBSAT=(SIII2+SIII6+(8.0-SIII4))/3.0
COMPUTE         PAYSAT=(SIV12+SIV13)/2.0
COMPUTE         INTMOV=(SIII1+SIII3+SIII5+(8.0-SIII7))/4.0
```

```
COMPUTE         SECSAT=(SIV11+SIV14)/2.0
COMPUTE         SOCSAT=(SIV2+SIV5+SIV8)/3.0
COMPUTE         SUPSAT=(SIV3+SIV6+SIV10)/3.0
COMPUTE         GWTHSAT=(SIV1+SIV4+SIV7+SIV9)/4.0
COMPUTE         A1=SV2-3.0
COMPUTE         A2=SV3-3.0
COMPUTE         A3=SV6-3.0
COMPUTE         A4=SV8-3.0
COMPUTE         A5=SV10-3.0

COMPUTE         A6=SV11-3.0
COMPUTE         INDGWTH=(A1+A2+A3+A4+A5+A6)/6.0
COMPUTE         MPS=((SKILL+TASKID+TASKSIG)/3.0)*AUTO*FEEDJOB
COMPUTE         H11=8.0-H1
COMPUTE         H14=8.0-H4
COMPUTE         HO=H11+H2+H3+H14
COMPUTE         ORGCIL=(SII15+SII16+SII19+SII21+SII22+SII25+SII27+(8.0-SII18)+
                (8.0-SII23)+(8.0-SII26))/10
COMPUTE         CMM=(SII17+SII20+(8.0-SII24))/3
COMPUTE         REWARD=(SIII8+(8.0-SIII9)+(8.0-SIII10))/3
VAR LABELS      SKILL,SKILL VARIETY/TASKID,TASK IDENTITY/TASKSIG,TASK SIGIFICANCE
                /AUTO,AUTONOMY IN JOB/FEEDJOB,FEEDBACK FROM THE JOB ITSELF/
                FEEDSUP,FEEDBACK FROM AGENTS/ASSOC,DEALING WITH OTHERS/
                JOBSAT,OVERALL SATISFACTION WITH THE JOB/PAYSAT,SATISFACTION WITH
                 PAY/INTMOV,INTERNAL WORK SELF-MOTIVATION/SECSAT,"SECURITY" SATIS
                FACTION/SOCSAT,"SOCIAL" SATISFACTION/SUPSAT,"SUPERVISORY" SATISFA
                CTION/GWTHSAT,PERSONAL GROWTH SATISFACTION FROM JOB/
                INDGWTH,INDVIVIDUAL GROWTH NEED STRENGTH/MPS,MOTIVATING POTENTIAL
                 SCORE/HO,HOPPOCK,S MEASURE OF JOB SATISFACTION/ORGCIL,ORGANIZATI
                ONAL CILMATE/CMM,COMMUNICATION/REWARD,REWARDS OF ORGANIZATION
MISSING VALUES  ALL(0)
IF              (SQUAD EQ 1) D7=1
IF              (SQUAD EQ 2) D20=1
IF              (SQUAD EQ 3) D9=1
IF              (SQUAD EQ 4) D4018=1
IF              (RANK LE 09) DR1=1
IF              (RANK GE 10) DR2=1
IF              (COMM EQ 1) DOTS=1
```

```
IF              (COMM EQ 2) DROTC=1
IF              (COMM EQ 3) DAFA=1
IF              (POS EQ 1) DP=1
IF              (POS EQ 2) DCP=1
IF              (POS EQ 3) DNB=1
IF              (POS EQ 4) DN=1
IF              (POS EQ 5) DEW=1
IF              (POS EQ 6) DG=1
*SELECT IF      (SQUAD EQ 1)
REGRESSION      METHOD=STEPWISE/
                VARIABLES=SKILL,TASKID,TASKSIG,AUTO,FEEDJOB,FEEDSUP,ASSOC,JOBSAT,
                INTMOV,PAYSAT,SECSAT,SOCSAT,SUPSAT,GWTHSAT,INDGWTH,MPS,HO,AGE,
                OER1,CARINT,EDUC,DR1 TO DG/
                REGRESSION=HO(15,2.0,*,*) WITH SKILL,TASKID,TASKSIG,AUTO,FEEDJOB,
                FEEDSUP,ASSOC,PAYSAT,INTMOV,SECSAT,SOCSAT,SUPSAT,GWTHSAT,MPS,
                INDGWTH,OER1,EDUC,CARINT,AGE,DR1 TO DG/
OPTIONS         2
STATISTICS      ALL
READ INPUT DATA
```

```
777765567261126166271246376766267677717615266665666666666607080808070807100708 10
265314432411265204111        4018TH  P  I   #212
746575667562127255362656266666366266646426225666665666667609090909090909090909 09
365313361441445132121        4018TH  P  A   #213
754677657371117273261757367763163677736624226677776777355310100910080909100910 10
275207341446435170000        4018TH  G  A   #214
755576767262226262231767677772266776726615226676776667553310090908090810091009 09
265206351446435140000        4018TH  G  A   #215
744443455235123315351421343554354544464422454545635542444101007090710070707101 0
542412341241263091123    4018 P     #216
6365245562523165272644374534665265535576112526566436352442081009100708060809101 0
455412322445465102134    4018 EW A #217
```

RANK

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
E-2	2.	4	1.6	1.6	1.6
E-3	3.	1	.4	.4	2.0
E-4	4.	8	3.3	3.3	5.3
E-5	5.	7	2.9	2.9	8.2
E-6	6.	11	4.5	4.5	12.7
E-7	7.	10	4.1	4.1	15.7
O-1	10.	1	.4	.4	17.1
O-2	11.	45	18.4	18.4	35.5
O-3	12.	127	51.8	51.8	87.3
O-4	13.	19	7.8	7.8	95.1
O-5	14.	12	4.9	4.9	100.0
	TOTAL	245	100.0	100.0	

COMM SOURCE OF COMMISION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OTS	1.	95	38.8	46.6	46.6
ROTC	2.	77	31.4	37.7	84.3
AIR FORCE ACADEMY	3.	12	4.9	5.9	90.2
OTHER	4.	20	8.2	9.8	100.0
	0	41	16.7	MISSING	100.0
	TOTAL	245	100.0	100.0	

CARINT AIR FORCE CAREER INTENTIONS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DEFINITELY WILL NOT	1.	18	7.3	7.3	7.3
PROBABLY WILL NOT	2.	15	6.1	6.1	13.5
UNDECIDED	3.	39	15.9	15.9	29.4
PROBABLY WILL	4.	75	30.6	30.6	60.0
DEFINITELY WILL	5.	98	40.0	40.0	100.0
	TOTAL	245	100.0	100.0	

RANK

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
E-2	2.	2	6.5	6.5	6.5
E-5	5.	1	3.2	3.2	9.7
E-7	7.	2	6.5	6.5	16.1
O-2	11.	8	25.8	25.8	41.9
O-3	12.	16	51.6	51.6	93.5
O-4	13.	2	6.5	6.5	100.0
	TOTAL	31	100.0	100.0	

POS CREW POSITION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PILOT	1.	9	29.0	29.0	29.0
CO-PILOT	2.	10	32.3	32.3	61.3
NAVIGATOR	4.	7	22.6	22.6	83.9
BOOM OPERATOR	7.	5	16.1	16.1	100.0
	TOTAL	31	100.0	100.0	

COMM SOURCE OF COMMISION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OTS	1.	12	38.7	46.2	46.2
ROTC	2.	11	35.5	42.3	88.5
AIR FORCE ACADEMY	3.	1	3.2	3.8	92.3
OTHER	4.	2	6.5	7.7	100.0
	0	5	16.1	MISSING	100.0
	TOTAL	31	100.0	100.0	

CARINT AIR FORCE CAREER INTENTIONS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DEFINITELY WILL NOT	1.	2	6.5	6.5	6.5
PROBABLY WILL NOT	2.	4	12.9	12.9	19.4
UNDECIDED	3.	5	16.1	16.1	35.5
PROBABLY WILL	4.	10	32.3	32.3	67.7
DEFINITELY WILL	5.	10	32.3	32.3	100.0
	TOTAL	31	100.0	100.0	

OER1

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	2	6.5	8.7	8.7
	2.	11	35.5	47.8	56.5
	3.	9	29.0	39.1	95.7
	4.	1	3.2	4.3	100.0
	0	8	25.8	MISSING	100.0
	TOTAL	31	100.0	100.0	

RANK

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
E-2	2.	1	1.3	1.3	1.3
E-3	3.	1	1.3	1.3	2.6
E-4	4.	3	3.8	3.8	5.4
E-5	5.	3	3.8	3.8	10.3
E-6	6.	3	3.8	3.8	14.1
E-7	7.	1	1.3	1.3	15.4
O-2	11.	21	26.9	26.9	42.3
O-3	12.	43	55.1	55.1	97.4
O-4	13.	1	1.3	1.3	98.7
O-5	14.	1	1.3	1.3	100.0
	TOTAL	78	100.0	100.0	

POS CREW POSITION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PILOT	1.	14	17.9	17.9	17.9
CO-PILOT	2.	8	10.3	10.3	28.2
RADAR NAVIGATOR	3.	17	21.8	21.8	50.0
NAVIGATOR	4.	11	14.1	14.1	64.1
ELECTRONIC WARFARE O	5.	16	20.5	20.5	84.6
GUNNER	6.	12	15.4	15.4	100.0
	TOTAL	78	100.0	100.0	

COMM SOURCE OF COMMISION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OTS	1.	38	48.7	57.6	57.6
ROTC	2.	20	25.6	30.3	87.9
AIR FORCE ACADEMY	3.	6	7.7	9.1	97.0
OTHER	4.	2	2.6	3.0	100.0
	0	12	15.4	MISSING	100.0
	TOTAL	78	100.0	100.0	

CARINT AIR FORCE CAREER INTENTIONS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DEFINITELY WILL NOT	1.	10	12.8	12.8	12.8
PROBABLY WILL NOT	2.	4	5.1	5.1	17.9
UNDECIDED	3.	13	16.7	16.7	34.6
PROBABLY WILL	4.	25	32.1	32.1	66.7
DEFINITELY WILL	5.	26	33.3	33.3	100.0
	TOTAL	78	100.0	100.0	

OER1

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	11	14.1	17.7	17.7
	2.	19	24.4	30.6	48.4
	3.	32	41.0	51.6	100.0
	0	16	20.5	MISSING	100.0
	TOTAL	78	100.0	100.0	

RANK

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJJSTED FREQ (PCT)	CUM FREQ (PCT)
E-2	2.	1	1.4	1.4	1.4
E-4	4.	5	6.9	6.9	8.3
E-5	5.	1	1.4	1.4	9.7
E-6	6.	2	2.8	2.8	12.5
O-1	10.	1	1.4	1.4	13.9
O-2	11.	16	22.2	22.2	36.1
O-3	12.	44	61.1	61.1	97.2
O-4	13.	1	1.4	1.4	98.6
O-5	14.	1	1.4	1.4	100.0
	TOTAL	72	100.0	100.0	

POS CREW POSITION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PILOT	1.	12	16.7	16.9	16.9
CO-PILOT	2.	12	16.7	16.9	33.8
RADAR NAVIGATOR	3.	10	13.9	14.1	47.9
NAVIGATOR	4.	13	18.1	18.3	66.2
ELECTRONIC WARFARE O	5.	15	20.8	21.1	87.3
GUNNER	6.	9	12.5	12.7	100.0
	0	1	1.4	MISSING	100.0
	TOTAL	72	100.0	100.0	

COMM SOURCE OF COMMISION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OTS	1.	32	44.4	50.8	50.8
ROTC	2.	25	34.7	39.7	90.5
AIR FORCE ACADEMY	3.	4	5.6	6.3	96.8
OTHER	4.	2	2.8	3.2	100.0
	0	9	12.5	MISSING	100.0
	TOTAL	72	100.0	100.0	

CARINT AIR FORCE CAREER INTENTIONS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DEFINITELY WILL NOT	1.	6	8.3	8.3	8.3
PROBABLY WILL NOT	2.	6	8.3	8.3	16.7
UNDECIDED	3.	18	25.0	25.0	41.7
PROBABLY WILL	4.	26	36.1	36.1	77.8
DEFINITELY WILL	5.	16	22.2	22.2	100.0
	TOTAL	72	100.0	100.0	

OER1

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJJSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	11	15.3	19.6	19.6
	2.	12	16.7	21.4	41.1
	3.	32	44.4	57.1	98.2
	4.	1	1.4	1.8	100.0
	0	16	22.2	MISSING	100.0
	TOTAL	72	100.0	100.0	

RANK

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
E-5	5.	2	3.8	3.8	3.8
E-6	6.	6	11.3	11.3	15.1
E-7	7.	7	13.2	13.2	28.3
O-3	12.	18	34.0	34.0	62.3
O-4	13.	13	24.5	24.5	86.8
O-5	14.	7	13.2	13.2	100.0
	TOTAL	53	100.0	100.0	

POS CREW POSITION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PILOT	1.	14	26.4	26.4	26.4
RADAR NAVIGATOR	3.	13	24.5	24.5	50.9
ELECTRONIC WARFARE O	5.	11	20.8	20.8	71.7
GUNNER	6.	12	22.6	22.6	94.3
ROOM OPERATOR	7.	3	5.7	5.7	100.0
	TOTAL	53	100.0	100.0	

COMM SOURCE OF COMMISION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OTS	1.	10	18.9	26.3	26.3
ROTC	2.	15	28.3	39.5	65.8
AIR FORCE ACADEMY	3.	1	1.9	2.6	68.4
OTHER	4.	12	22.6	31.6	100.0
	0	15	28.3	MISSING	100.0
	TOTAL	53	100.0	100.0	

CARINT AIR FORCE CAREER INTENTIONS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PROBABLY WILL NOT	2.	1	1.9	1.9	1.9
UNDECIDED	3.	3	5.7	5.7	7.5
PROBABLY WILL	4.	12	22.6	22.6	30.2
DEFINITELY WILL	5.	37	69.8	69.8	100.0
	TOTAL	53	100.0	100.0	

OER1

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	4	7.5	10.8	10.8
	2.	15	28.3	40.5	51.4
	3.	18	34.0	48.6	100.0
	0	16	30.2	MISSING	100.0
	TOTAL	53	100.0	100.0	

APPENDIX E

DEFINITIONS OF EEOC JOBS

APPENDIX E

DEFINITIONS OF EEOC JOBS

Van Maanen and Katz (1974) administered sections of the JDS to a large sample of public employees. The sample included four governmental organizations (two cities, one county, and one state). Within each governmental entity, a stratified random sample of public employees was determined. Of the total sample of 3500 employees, 88 percent participated. The stratification was based on eight Equal Employment Opportunity Commission (EEOC) job categories:

1. Administrators: Occupations in which employees set broad policies and exercise or direct overall responsibility for execution of these policies. Includes: department heads, bureau chiefs, division chiefs, directors, wardens, inspectors, superintendents, police and fire chiefs, unit supervisors, and kindred workers.

2. Professionals: Occupations which require specialized and theoretical knowledge usually acquired through college training or through work experience. Includes: doctors, psychologists, registered nurses, personnel and labor relations workers, lawyers, system analysts, accountants, engineers, teachers, employment and vocational rehabilitation counselors, and kindred workers.

3. Technicians: Occupations which require a combination of basic scientific or technical knowledge and manual skill which can be obtained through specialized post-secondary school education or through equivalent on-the-job training. Includes: computer programmers and operators, draftsmen, surveyors, photographers, radio operators, assessors, technicians, practical nurses, and kindred workers.

4. Protective Service: Occupations in which workers are entrusted with public safety, security, and protection from destructive forces. Includes: police officers, fire fighters, guards, bailiffs, detectives, marshals, and kindred workers.

5. Paraprofessionals: Occupations in which workers perform some of the duties of a professional or technician in a supportive role--usually requiring less formal training.

Includes: library assistants, research assistants, medical aides, child support workers, welfare service aides, police auxiliary, and kindred workers.

6. Office and Clerical: Occupations in which workers are responsible for communications, recording and retrieval of information, and other paper work required in an office. Includes: bookkeepers, messengers, stenographers, clerks, transcribers, office machine operators, license distributors, and kindred workers.

7. Skilled Craft: Occupations in which workers perform jobs which require special manual skill and a knowledge of the processes involved in the work--acquired through on-the-job training and experience or through apprenticeship or other formal training programs. Includes: mechanics, repairmen, electricians, carpenters, heavy equipment operators, skilled machinists, typesetters, and kindred workers.

8. Service and Maintenance: Occupations in which workers perform duties which result in or contribute to the comfort, convenience, hygiene, or safety of the general public or which contribute to the upkeep and care of buildings, facilities, or grounds of public property. Includes: chauffeurs, truck and bus drivers, refuse collectors, custodial personnel, gardeners, groundkeepers, construction workers, garage laborers, laundry and dry cleaning operatives, and kindred workers.

VITA

Alvin E. Krebs, Jr. was born on 7 September 1946 in Benton, Arkansas. After going through the 8th grade in Arkansas, his family moved to Tacoma, Washington, where he graduated from Clover Park High School. In 1964, he entered the University of Arkansas, graduating in January 1969 with a Bachelor of Science in mathematics. Also, he was a member of the Air Force Reserve Officers Training Corps while a student at Arkansas, and was commissioned a Second Lieutenant on 26 January 1969. After receiving his aeronautical rating of Navigator from the 3935th Navigator Training Wing, Mather Air Force Base, California, he went on to Electronic Warfare Officer School at Mather, graduating in June 1970. B-52 Combat Crew Training School at Castle Air Force Base, California came next, from which he was assigned to the 7th BMW, Carswell Air Force Base, Texas, in October 1970. Three and one-half years were spent in the 20th BS with many TDY tours in Southeast Asia during the Vietnam War. The last two and one-half years were spent as an Electronic Warfare Officer Instructor in the 4018 CCTS at Carswell. In June 1976 he was assigned to the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, as a graduate student in Graduate Systems Management. He is married to the former Sherian Davis of Gary, Texas.

Permanent address: Route 1
Gary, Texas 75643

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

This study was conducted to determine the job satisfaction levels and factors affecting them for the four flying squadrons--the 7th ARS, 9th BS, 20th BS, and the 4018 CCTS--of the 7th BMW, Carswell Air Force Base, Texas. A questionnaire composed of the Job Diagnostic Survey developed by Hackman and Oldham, the Hoppock Measure of Job Satisfaction, organizational climate, and biographical questions was administered with 245 useable surveys returned. Job satisfaction

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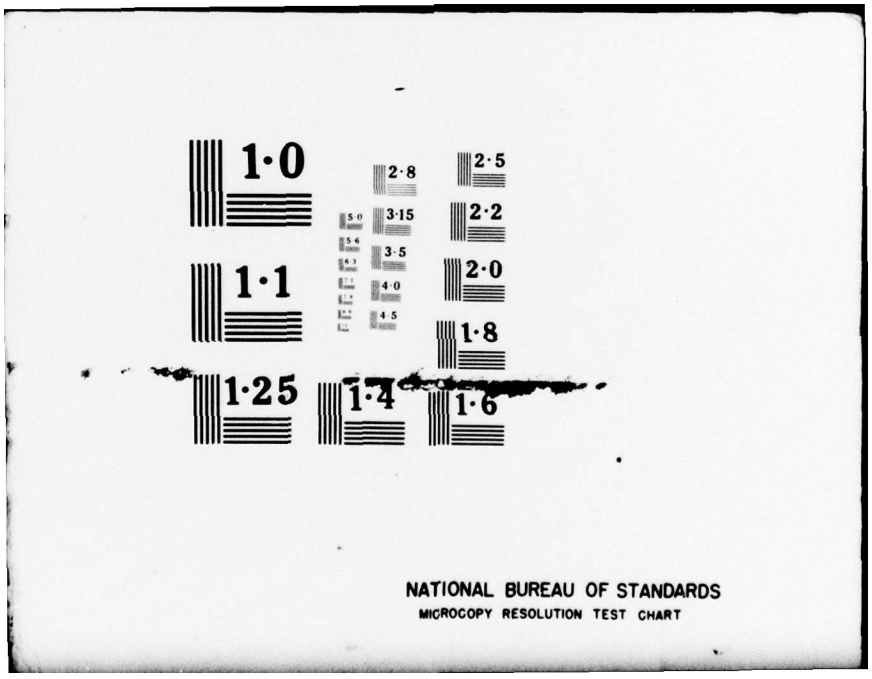
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MICROCOPY RESOLUTION TEST CHART

(Block 20.)
levels and other factors were found to be significantly different between the 4018 CCTS and the other squadrons. The 4018 CCTS seemed to be highly satisfied and motivated. The 7th ARS appeared to be more satisfied with its supervisors, while no significant differences were found between the 9th BS and 20th BS. These two squadrons were low on most of the variables measured. When the different crew positions were examined--Pilot, Co-pilot, Radar Navigator, Navigator, Electronic Warfare Officer, Gunner, and Boom Operator-- job satisfaction level differences were found only between Pilots and the Navigators and Electronic Warfare Officers. Pilots, Radar Navigators, and Gunners seemed to be fairly satisfied with their jobs, while the other three were less satisfied, especially the Electronic Warfare Officers, who were the lowest and significantly different from the other crew positions on most of the different factors of job satisfaction measured. Their lower OER ratings seem to have an influence on this dissatisfaction. Overall, the 7th BMW personnel perceived that their job satisfaction stemmed from their own personal feelings about the job itself rather than from the objective characteristics of the job.