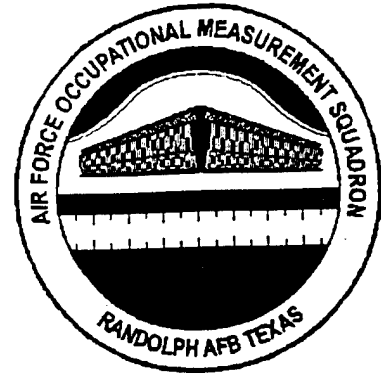*UNITED STATES*
AIR FORCE

OCCUPATIONAL SURVEY REPORT

**COMMUNICATIONS-COMPUTER SYSTEMS
PROGRAMMING**

AFSC 3C0X2

AFPT 90-3C0-016

AUGUST 1995

OCCUPATIONAL ANALYSIS PROGRAM
AIR FORCE OCCUPATIONAL MEASUREMENT SQUADRON
AIR EDUCATION and TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-4449

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PREFACE

This report presents the results of an Air Force Occupational Survey of the AFSC 3C0X2 Communications-Computer Systems Programming career ladder and the related civilian career field (Occupational Series 334). Authority to conduct occupational surveys is contained in AFI 36-2623. Computer products used in this report are available for use by operations and training officials.

Captain Charles T. McIntyre, Inventory Development Specialist, developed the survey instrument. Mr. James T. "Tom" Duffy, Occupational Analyst, analyzed the data and wrote the final report. Second Lieutenant Sheon H. Mendoza provided computer programming, and Mr. Richard G. Ramos provided administrative support. Major Randall C. Agee, Chief, Airman Analysis Section, Occupational Analysis Flight, Air Force Occupational Measurement Squadron, reviewed and approved this report for release.

Copies of this report are distributed to Air Staff sections, major commands, and other interested training and management personnel. Additional copies are available upon request to the Air Force Occupational Measurement Squadron, Attention: Chief, Occupational Analysis Flight (OMY), 1550 5th Street East, Randolph AFB Texas 78150-4449 (DSN 487-6623).

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SUMMARY OF RESULTS

1. *Survey Coverage:* The AFSC 3C0X2 Communications-Computer Systems Programming career ladder and the related civilian career field (Occupational Series 334) were surveyed to identify changes in the career ladder over the past 5 years. Survey results are based on responses from 1,827 AFSC 3C0X2 personnel (66 percent of the assigned population) and 181 civilian Occupational Series 334 personnel. Skill levels and paygrades were well represented.

2. *Career Ladder Structure:* Structure analysis identified four clusters and four independent jobs: General Programming cluster, Small Computer Programming cluster, Supervision cluster, Security cluster, Requirements Analysis independent job, Test Analysis independent job, Resident Course Instruction independent job, and Contracting independent job.

3. *Career Ladder Progression:* After completion of AFSC 3C0X2 basic resident course, career field personnel follow a somewhat different than normal career progression pattern. Survey data indicates that members of this career ladder, including the 7-skill level, remain highly technical in task performance. Unlike most AFSCs, where normal career ladder progression includes a decrease in technical task performance and an increase in supervisory performance at the 7-skill level, these 7-skill level Communications-Computer Systems Programmers concentrate the majority of their time performing technical tasks.

4. *Training Analysis:* Matching survey data to the AFSC 3C0X2 Specialty Training Standard (STS), and Plan of Instruction, E3ABR3C032-000/E3AZR3C032-001, revealed that both documents are well supported by career ladder personnel. Survey data indicated only four performance level items in the STS that did not meet the 20 percent performing criteria, and only one performance level criterion objective in the POI had less than the 30 percent performing requirement.

5. *Job Satisfaction Analysis:* Overall, AFSC 3C0X2 and Occupational Series 334 respondents appear quite satisfied with their jobs. When compared to other direct support AFSCs surveyed in 1993, AFSC 3C0X2 members in the 1-48 months and 49-96 months total active federal military service (TAFMS) indicated slightly higher responses than respondents in the comparative sample. However, perception of talents and training were lower (with the exception of 1-48 months TAFMS in perceived use of talents) than those of the comparative sample. Additionally, AFSC 3C0X2 members' sense of accomplishment and reenlistment intentions, across all TAFMS groups, were also lower than the comparative sample.

6. *Implications:* AFMAN 36-2108 Specialty Descriptions for the AFSC 3C0X2 career ladder are well supported by survey data. Individual analysis of each skill level specialty description could not be accomplished due to the manner in which the descriptions are written in both AFMAN 36-2108 and the AFSC 3C0X2 Career Field Education and Training Plan. There are no separate skill level descriptions in these documents. Job satisfaction problems appear to exist

within this specialty for perceived use of talents and training. AFSC 3C0X2 military reenlistment intentions are lower than those of a comparative sample of similar Air Force personnel surveyed in 1993.

OCCUPATIONAL SURVEY REPORT (OSR)
COMMUNICATIONS COMPUTER SYSTEMS PROGRAMMING
CAREER LADDER
(AFSC 3C0X2)
AND
CIVILIAN OCCUPATIONAL SERIES 344

INTRODUCTION

This is a report of an occupational survey of the Communications-Computer Systems Programming career ladder (AFSC 3C0X2) and the related civilian career field (Occupational Series 334) conducted by the Occupational Analysis Flight, Air Force Occupational Measurement Squadron (AFOMS). This survey will ensure current data for use in identifying changes in the career ladder over the past 5 years. AFSC 3C0X2 military personnel were last surveyed in 1987 (then AFSC 491X2). Civilian Occupational Series 334 personnel were not included in the 1987 study.

Background

According to the specialty descriptions in *AFSC 3C0X2 Career Field Education and Training Plan*, 3-, 5-, and 7-skill level personnel supervise and perform communications-computer systems software programming and analyst activities and functions. Members develop computer systems, programs, and procedures. They interpret general specifications, code, set up formats, test, maintain, and modify programs. Also, members analyze and design automated systems, prepare documentation of proposed specifications and programs, and perform program and documentation maintenance.

Initial 3-skill level training for AFSC 3C0X2 personnel is provided through an 11-week course at Keesler AFB MS. The Apprentice Communications-Computer Systems Programming Specialist course, E3ABR3C032-000/E3AZR3C032-001, covers: introduction to software technology, hardware concepts and software concepts; software engineering goals, software engineering principles, software life cycle, problem solving and algorithm design; ADA programming fundamentals; computer concepts, and low level programming concepts; software maintenance concepts and entry level COBOL; and data base management systems.

Entry into this career ladder requires a minimum score of 71 on the USAF Electronic Data Processing Test and a General Armed Forces Vocational Aptitude Test Battery score of at least 53. In addition, they must meet or exceed the Strength and Stamina Requirement of "G" (lifting a weight of 40 lbs).

SURVEY METHODOLOGY

Inventory Development

The data collection instrument for this occupational survey was USAF Job Inventory (JI), AFPT 90-3C0-016, dated November 1993. A tentative task list was prepared after reviewing pertinent career ladder publications and directives and tasks from the previous applicable OSRs. The preliminary task list was refined and validated through personal interviews with 55 subject-matter experts (SMEs) at the following locations:

BASE	REASON FOR VISIT
Keesler AFB MS	Technical Training School
Langley AFB VA	Group Level Organization (ACC)
Gunter AFB AL	AF Software Development
Randolph AFB TX	HQ AFMPC - Mainframe Systems
Offutt AFB NE	AF Global Weather Center
Offutt AFB NE	USSTRATCOM

Others contacted included Air Force functional and resource managers and the career field training manager. The resulting JI contained a comprehensive listing of 407 tasks grouped under 12 duty headings, with a background section requesting such information as primary responsibilities, organizational level, level of systems programmed, programming languages used, numbering systems used, and characters used. Also requested was information on grade, time in present job, time in service, time in career field, and job satisfaction indicators.

Survey Administration

From December 1993 through May 1994, Military Personnel Flights at operational bases worldwide administered the inventory to all eligible AFSC 3C0X2 and selected civilian Occupational Series 344 personnel. Members eligilble for the survey consisted of the total assigned military population and selected civilians, excluding those who were hospitalized, personnel in transition for a permanent change of station, personnel retiring within the time the inventories were administered, and personnel in their jobs less than 6 weeks. Military participants were selected from a computer-generated mailing list obtained from personnel data tapes maintained by AFMPC, Randolph AFB TX. The mailing list for civilians was provided by the Air Force Civilian Personnel management Center, also at Randolph.

Each individual who completed the inventory first filled in an identification and biographical information section and then checked each task performed in his or her current job. After checking tasks performed, each individual rated the tasks checked on a 9-point scale showing relative time spent on that task, compared to other tasks performed. The ratings ranged from 1 (very small amount time spent) to 9 (very large amount time spent).

To determine relative time spent for each task, all of the incumbent's ratings are assumed to account for 100 percent of time spent on the job and are summed. Each task rating is then divided by the total task ratings and multiplied by 100 to provide a relative percentage of time spent on each task.

Survey Sample

Personnel were selected to participate in this study so as to ensure an accurate representation across skill levels and paygrades. Table 1 reflects the military and civilian distribution in the survey sample. Table 2 reflects the survey distribution by paygrade groups. As shown by both tables, the survey sample accurately reflects the overall populations of each career ladder.

TABLE 1	
MILITARY/CIVILIAN REPRESENTATION OF TOTAL SAMPLE	
TOTAL ASSIGNED MILITARY	2,776
TOTAL SURVEYED MILITARY	2,320
TOTAL MILITARY IN SAMPLE	1,827
PERCENT OF ASSIGNED MILITARY IN SAMPLE	66%
PERCENT OF SURVEYED MILITARY IN SAMPLE	79%
TOTAL SURVEYED CIVILIANS	327
TOTAL CIVILIANS IN SAMPLE	181
PERCENT OF SURVEYED CIVILIANS IN SAMPLE	55%

	TABLE 2	
PAYGRADE DISTRIBUTION OF MILITARY IN SAMPLE		
PAYGRADE	PERCENT OF TOTAL MILITARY ASSIGNED	PERCENT OF MILITARY IN SAMPLE
E-1 TO E-4	38	40
E-5	27	28
E-6	20	18
E-7	15	14
E-8	*	*
* Less than 1 percent		

In addition, Figure 1 shows an overview of all military and civilian respondents in the survey sample. As shown, the total survey sample consists of 1,827 military respondents (91 percent of the overall sample) and 181 civilian respondents (9 percent of the overall sample).

OVERALL SAMPLE
DISTRIBUTION

TOTAL RESPONDENTS IN SURVEY	2,008
TOTAL MILITARY IN SURVEY	1,827
TOTAL CIVILIAN IN SURVEY	181
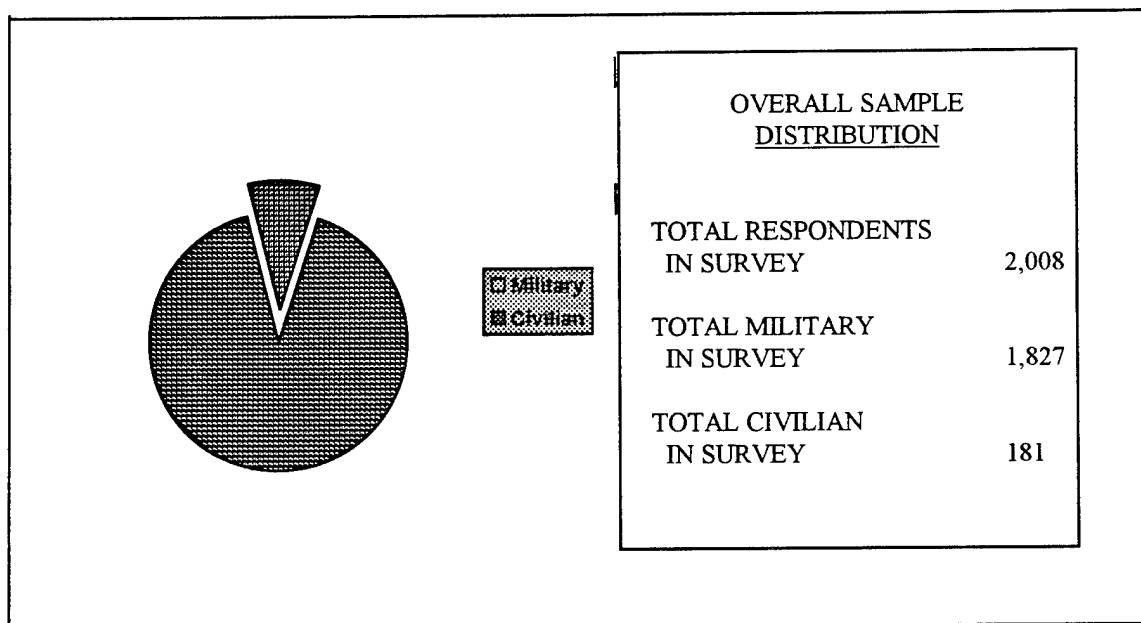
Figure 1. Overview of military and civilian respondents in survey sample

Task Factor Administration

Job descriptions alone do not provide sufficient data for making decisions about career ladder documents or training programs. Task factor information is needed for a complete analysis of the career ladder. To obtain the needed task factor data, selected senior AFSC 3C0X2 personnel

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(generally E-6 or E-7 craftsmen) also completed a second booklet for either training emphasis (TE) or task difficulty (TD). The TE and TD booklets were processed separately from the JIs. This information is used in a number of analyses discussed in more detail within this report.

Training Emphasis (TE). Training emphasis is defined as the degree of emphasis that should be placed on each task for structured training of first-enlistment personnel. Structured training is defined as resident technical schools, field training detachments, mobile training teams, formal on-the-job training (OJT), or any other organized training method. Thirty-nine experienced AFSC 3C0X2 NCOs rated the tasks in the inventory on a 10-point scale ranging from 0 (no training required) to 9 (extremely high training emphasis). Overall agreement among the raters was acceptable.

The average TE rating for this study is 2.13, with a standard deviation of 1.43. Tasks with a TE rating of 3.56 or greater are considered important to train new AFSC 3C0X2 personnel to perform.

Task Difficulty (TD). Task difficulty is defined as the amount of time needed to learn to perform each task satisfactorily. Forty-seven experienced AFSC 3C0X2 supervisors rated the difficulty of the tasks in the inventory using a 9-point scale ranging from 1 (extremely low difficulty) to 9 (extremely high difficulty). Interrater agreement among these respondents was extremely high. TD ratings are normally adjusted so tasks of average difficulty have a value of 5.00 and a standard deviation of 1.00. Any task with a difficulty of 6.00 or greater is considered to be difficult to learn.

When used in conjunction with the primary criterion of percent members performing, TD and TE ratings can provide insight into first-enlistment personnel training requirements. Such insights may suggest a need for lengthening or shortening portions of instruction supporting Air Force Specialty entry-level jobs.

CAREER LADDER STRUCTURE

The first step in the analysis process is to identify the structure of career ladders in terms of the jobs performed by the respondents. The Comprehensive Occupational Data Analysis Programs (CODAP) assists by creating an individual job description for each respondent based on the tasks performed and relative amount of time spent on these tasks. The CODAP automated job clustering program then compares all the individual job descriptions, locates the two descriptions with the most similar tasks and time spent ratings, and combines them to form a composite job description. In successive stages, CODAP either adds new members to this initial group or forms new groups based on the similarity of tasks and time spent ratings.

The basic group used in the hierarchical clustering process is the Job. When two or more jobs have a substantial degree of similarity in tasks performed and time spent on tasks, they are grouped together and identified as a Cluster. A specialized job too dissimilar to fit within a cluster is labeled an Independent Job. The job structure resulting from this grouping process (the various jobs within the career ladder) can be used to evaluate the changes that have occurred in the AFSC over the past 5 years. The above terminology will be used in the discussion of the AFSC 3C0X2 career ladder.

Overview of Specialty Jobs

Based on the analysis of tasks performed and the amount of time spent performing each task, four clusters and four independent jobs were identified within the surveyed career ladders. Figure 2 illustrates the jobs performed by AFSC 3C0X2 personnel.

GENERAL PROGRAMMING CLUSTER 58%

NOT GROUPED 10%

SUPERVISION CLUSTER 7%

SECURITY CLUSTER 3%

OTHER 3%

SMALL COMPUTER PROGRAMMING CLUSTER 19%

OTHER: INCLUDES REQUIREMENTS ANALYSIS, TEST ANALYSIS, RESIDENT COURSE INSTRUCTION, AND CONTRACTING INDEPENDENT JOBS
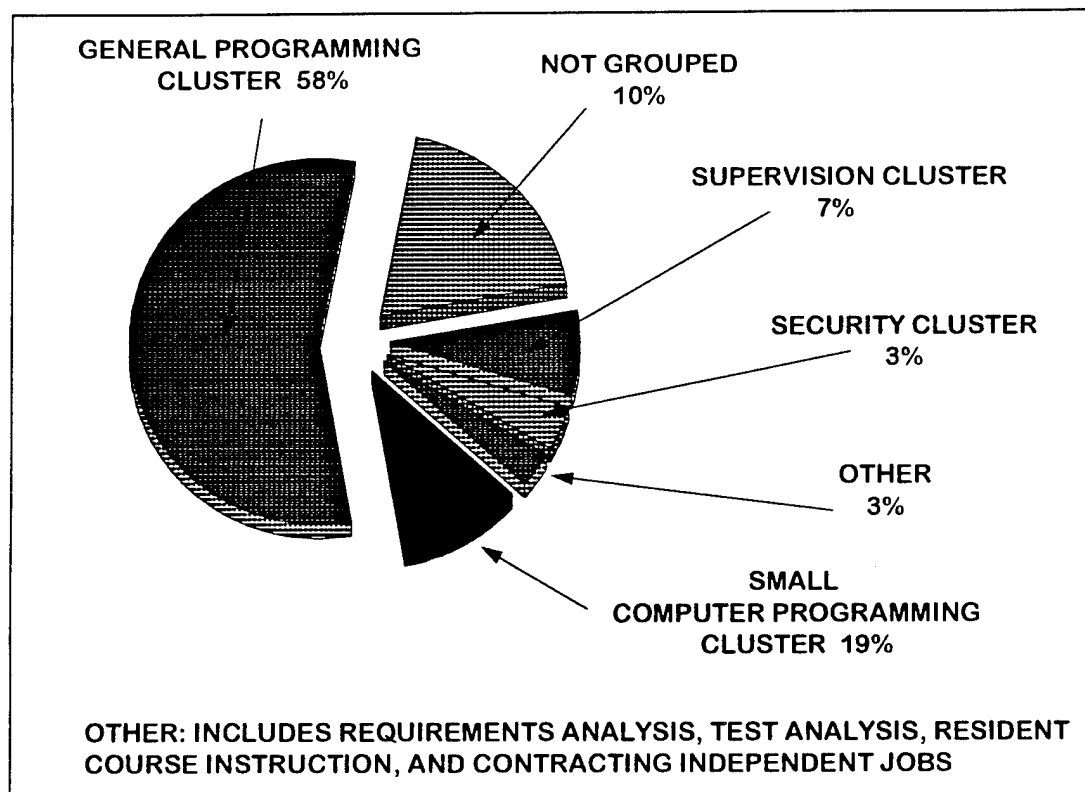
Figure 2. Identified job structure and percentages of total survey sample

A listing of these job clusters and independent jobs is provided below. The stage (STG) number shown beside each title references computer-printed information; the letter "N" represents the number of personnel in each group.

I. GENERAL PROGRAMMING CLUSTER (STG045, N=1,120)

    A. Entry Level Programming Job (STG477, N=51)
    B. Small Computer Repair Job (STG519, N=23)
    C. On-the-Job Trainers Job (STG624, N=10)
    D. Senior Systems Programming Job (STG390, N=13)
    E. Technical Supervisors Job (STG287, N=49)
    F. Systems Programming Job (STG254, N=20)
    G. Data Base Administration Job (STG322, N=16)

II. SMALL COMPUTER PROGRAMMING CLUSTER (STG055, N=386)

    A. Local Area Network Administrators
    B. Senior Local Area Network Administrators

III. SUPERVISION CLUSTER (STG047, N=148)

    A. First-Line Supervisors
    B. Senior Supervisors

IV. REQUIREMENTS ANALYSIS INDEPENDENT JOB (STG039, N=31)

V. TEST ANALYSIS INDEPENDENT JOB (STG442, N=17)

VI. SECURITY CLUSTER (STG049, N=62)

    A. Communications-Computer Security Programmers
    B. Physical Security

VII. RESIDENT COURSE INSTRUCTION INDEPENDENT JOB (STG416, N=18)

VIII. CONTRACTING INDEPENDENT JOB (STG100, N=16)

The respondents forming these groups account for 90 percent of the survey sample. The remaining 10 percent were performing tasks which did not group with any of the other defined jobs. Some of the job titles given by respondents which were representative of these personnel include: NCOIC, CODAP Programming, Worldwide Military Command and Control System Monitor, and Weather Network Duty Officer.

Group Descriptions

The following paragraphs contain brief descriptions of the four clusters and four independent jobs identified through the career ladder structure analysis. Appendix A lists representative tasks performed by identified cluster and job groups. Table 3 displays time spent on duties, while Table 4 provides demographic information for each cluster and job discussed within this report.

Another way to illustrate these jobs is to summarize tasks performed into groups of tasks (task modules). This allows for a very concise display of where job incumbents spend most of their time and develops a comprehensive overview of each job. Each job/cluster description contains a display of related task modules. This display shows the number of tasks included in a module, the average percent time spent on that module, and an average percent of members performing the particular task module. These modules were identified through CODAP coperformance clustering, which calculates the probability that members who perform one task will also perform a second task or group of related tasks. Representative task modules are listed as part of the job description. The list of modules with respective tasks is presented in Appendix B.

I. GENERAL PROGRAMMING CLUSTER (STG045). The 1,120 members of this cluster represent 56 percent of the total survey sample. This is the largest cluster in the sample survey and represents the core work of the Communications-Computer Systems career ladder. Personnel within the General Programming cluster spend nearly 46 percent of their time performing software development, implementation, and maintenance tasks (see Table 3). In addition, members of the General Programming cluster spend 21 percent of their job time performing general communications-computer systems activities. On average, General Programming cluster members perform 82 tasks.

GENERAL PROGRAMMING CLUSTER	
Number of members	1,120
Percent of total sample	56%
Average number of tasks performed	82
Average time in present job	3 yrs
Average time in career field	5 yrs
Average TAMS	9 yrs
Predominant paygrades	E-5, GS-11

Representative tasks for this cluster include:

- Debug computer programs
- Code computer programs in high-level compiler languages
- Compile or assemble programs
- Desk check programs
- Correct syntax errors
- Assist customers in resolving computer software malfunctions or problems

- Modify communications-computer systems applications
- Maintain source code listings

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TABLE 3

AVERAGE PERCENT TIME SPENT ON DUTIES BY CAREER LADDER JOBS

DUTIES	GENERAL PROGRAMMING CLUSTER (STG45)	SMALL COMPUTER PROGRAMMING CLUSTER (STG55)	SUPERVISION CLUSTER (STG47)	REQUIREMENTS ANALYSIS INDEPENDENT JOB (STG239)
A ORGANIZING AND PLANNING	3	6	16	6
B DIRECTING AND IMPLEMENTING	2	3	12	3
C INSPECTING AND EVALUATING	2	2	12	2
D TRAINING	2	3	14	3
E PERFORMING GENERAL COMMUNICATIONS-COMPUTER SYSTEMS ACTIVITIES	21	53	19	17
F PERFORMING SOFTWARE PLANNING AND DESIGN ACTIVITIES	15	8	7	48
G PERFORMING SOFTWARE DEVELOPMENT, IMPLEMENTATION, AND MAINTENANCE	45	12	9	16
H PERFORMING SOFTWARE TESTING, QUALITY ASSURANCE AND CONFIGURATION MANAGEMENT FUNCTIONS	6	5	5	3
I PERFORMING MAGNETIC MEDIA LIBRARY FUNCTIONS	.5	1	.5	0
J MAINTAINING SECURITY	3	5	4	1
K PERFORMING SUPPLY OR CONTRACTING FUNCTIONS	.4	2	2	1

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TABLE 3 (CONTINUED)

AVERAGE PERCENT TIME SPENT ON DUTIES BY CAREER LADDER JOBS

DUTIES	TEST ANALYSIS INDEPENDENT JOB (STG442)	SECURITY CLUSTER (STG49)	RESIDENT COURSE INSTRUCTION INDEPENDENT JOB (STG416)	CONTRACTING INDEPENDENT JOB (STG100)
A ORGANIZING AND PLANNING	3	3	6	9
B DIRECTING AND IMPLEMENTING	2	3	3	2
C INSPECTING AND EVALUATING	2	2	3	6
D TRAINING	1	2	60	1
E PERFORMING GENERAL COMMUNICATIONS-COMPUTER SYSTEMS ACTIVITIES	14	32	13	14
F PERFORMING SOFTWARE PLANNING AND DESIGN ACTIVITIES	8	3	3	3
G PERFORMING SOFTWARE DEVELOPMENT, IMPLEMENTATION, AND MAINTENANCE	14	14	11	2
H PERFORMING SOFTWARE TESTING, QUALITY ASSURANCE AND CONFIGURATION MANAGEMENT FUNCTIONS	50	8	*	6
I PERFORMING MAGNETIC MEDIA LIBRARY FUNCTIONS	1	2	*	*
J MAINTAINING SECURITY	3	31	*	1
K PERFORMING SUPPLY OR CONTRACTING FUNCTIONS	*	*	0	56

* Denotes less than 1 percent

NOTE: Columns may not add to 100 percent due to rounding

TABLE 4

SELECTED BACKGROUND DATA FOR CAREER LADDER JOBS

	GENERAL PROGRAMMING CLUSTER	SMALL COMPUTER PROGRAMMING CLUSTER	SUPERVISION CLUSTER	REQUIREMENTS ANALYSIS CLUSTER
NUMBER IN GROUP	1120	386	148	31
PERCENT OF SAMPLE	56%	19%	7%	2%
DAFSC DISTRIBUTION				
3C032	10%	5%	0%	3%
3C052	50%	49%	20%	42%
3C072	30%	39%	74%	35%
Civilian	9%	8%	6%	19%
PAYGRADE DISTRIBUTION				
E-1 to E-4	39%	39%	5%	16%
E-5	28%	25%	19%	23%
E-6	15%	18%	25%	16%
E-7	9%	10%	45%	23%
E-8	0%	0%	1%	3%
GS-07	0%	0%	0%	0%
GS-09	1%	2%	2%	6%
GS-11	7%	5%	3%	10%
GS-12	1%	0%	0%	3%
GM-13	0%	0%	1%	0%
Average number of tasks performed	82	59	71	36
Average years TICF	5	6	8	7
Percent with 1-48 months in career field	50%	26%	29%	25%

TABLE 4 (CONTINUED)

SELECTED BACKGROUND DATA FOR CAREER LADDER JOBS

	TEST ANALYSIS INDEPENDENT JOB	SECURITY CLUSTER	RESIDENT COURSE INSTRUCTION INDEPENDENT JOB	CONTRACTING INDEPENDENT JOB
NUMBER IN GROUP	17	62	18	16
PERCENT OF SAMPLE	1%	3%	*	*
DAFSC DISTRIBUTION:				
3C032	18%	10%	0%	0%
3C052	41%	55%	67%	13%
3C072	24%	29%	33%	31%
Civilian	18%	6%	0%	56%
PAYGRADE DISTRIBUTION:				
E-1 to E-4	47%	52%	28%	13%
E-5	12%	24%	56%	6%
E-6	18%	15%	11%	6%
E-7	6%	8%	6%	19%
E-8	0%	0%	0%	0%
GS-07	0%	0%	0%	0%
GS-09	0%	3%	0%	19%
GS-11	18%	3%	0%	38%
GS-12	0%	0%	0%	0%
GM-13	0%	0%	0%	0%
Average number of tasks performed	34	40	30	16
Average years TICF	5	5	8	9
Percent with 1-48 months in career field	54%	52%	18%	6%

* Indicates less than 1 percent

NOTE: Columns may not add to 100 percent due to rounding

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Representative task modules of this cluster include:

TM	Module Title	No. of Tasks	Percent Time Spent	Percent Members Performing
0003	Coding	17	23	23
0004	Input/Output	4	3	26
0005	Program Analysis	4	2	28
0009	Data Base	10	6	34

These data show the emphasis of this job is toward coding and other aspects of general programming duties and tasks. Most of the different tiers of programming fall into these task modules, such as applications programmers, systems programmers, analysis and data base administration.

The majority of General Programming cluster incumbents are military (91 percent). Civilians comprise the remaining 9 percent. Table 4 shows expanded background data across career ladder jobs.

Respondents holding this job vary widely across experience levels and paygrades. For example, the average time in the AFSC 3C0X2 career ladder for military General Programming cluster members is 9 years. The average time for civilians in Occupational Series 334 is just under 8 years. However, military incumbents in this cluster range from less than 1 year to over 20 years experience in the AFSC 3C0X2 career ladder. Civilian experience in this cluster ranges from just over 1 year to over 9 years. Survey data also show that this job is performed by personnel in military paygrades ranging from E-2 through E-7 (primarily by E-5 and E-6 personnel).

Seven jobs were identified in the General Programming cluster. These are: Entry Level Programming, Small Computer Repair, On-The-Job Training, Senior Systems Programming, Systems Programming, Technical Supervision, and Data Base Administration. Although most of the members of the General Programming cluster indicated they perform tasks pertaining to applications programming, these jobs warrant discussion of their own. A description of each of the seven jobs follows.

A. <u>Entry Level Programming Job (STG477, N=51)</u>. The average number of tasks performed (16) by members of this job is the smallest in the survey sample. With an average paygrade of E-4 and less than 3 years in the career field, this job is performed by the most junior members in the survey sample. Sixty-one percent are 5-levels and 20 percent hold the 3-level AFSC.

Representative tasks performed by this job are:

- Code computer programs in high-level compiler languages
- Compile or assemble programs
- Debug computer programs
- Desk check programs
- Correct syntax errors
- Code error handling routines
- Modify communications-computer applications
- Review source code listings

B. <u>Small Computer Repair Job (STG519, N=23)</u>. Although not a function of the Communications-Computer Systems Programming AFSC, responses to tasks pertaining to small computer repair were collected from the survey sample. Twenty of the twenty-three incumbents indicate they perform user maintenance on communications-computer system equipment, while 17 remove and replace microcomputer internal components. It should be pointed out that tasks pertaining to computer repair are functions of AFSC 3C0X1, Communications-Computer Systems Operators. With an average paygrade of E-4, these members have a little over 5 years in the career ladder. They perform an average of 94 tasks.

Representative tasks for this job include:

- Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment
- Transfer programs or data from one media to another media on systems other than mainframes
- Review disk directories on systems, other than mainframes
- Check operational status of equipment
- Format data storage media on systems, other than mainframes
- Perform user maintenance on communications-computer systems equipment
- Remove or replace microcomputer internal components
- Prepare peripheral equipment for operation on systems other than mainframes

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C. On-The-Job Trainers Job (STG624, N=10). These job incumbents differ from other trainers by conducting OJT in the shop or unit. With an average paygrade of E-5, they have just under 10 years total active service. They average 6 years in the career ladder and spend 18 percent of their duty time performing tasks pertaining to training. Members of this group perform an average of 117 tasks.

Representative tasks for OJT job members include:

- Conduct OJT
- Determine OJT requirements
- Evaluate progress of students
- Develop course control documents, such as specialty training standards (STSs)
- Counsel trainees on training progress
- Develop training aids
- Plan OJT
- Maintain training records, charts, or graphs

D. Senior Systems Programming Job (STG390, N=13). Members in this job differ from those with the Systems Programming job because of the nature of tasks performed. Members in this job, as in the systems programming job, develop and maintain the system programs utilized by applications programmers. Tasks with verbs such as review, coordinate, and determine distinguish this job description and indicate performance by senior or supervisory members. With over 8 years total active military service, these incumbents have an average paygrade of E-5. They perform an average of 86 tasks.

Representative task performed by this job are:

- Review communications-computer systems software release or patch documentation on mainframes
- Coordinate new systems releases with users
- Review computer operations manuals
- Determine impact of operating systems errors
- Inventory software release packages
- Determine impact of releases or changes to systems data bases
- Develop or maintain communications-computer systems user manuals
- Determine impact of operating systems errors

E. Technical Supervisors Job (STG287, N=49). In addition to performing tasks pertaining to software development and software planning and design, incumbents in this job also spend part of their duty time on supervisory functions (18 percent). Thirty-three percent of these members are in paygrades E-6/E-7 and average almost 13 years TAFMS. They perform an average of 63 tasks.

Representative tasks performed by this job include:

- Code computer programs in high-level compiler languages
- Write EPRs
- Debug computer programs
- Evaluate personnel for compliance with performance standards
- Compile or assemble programs
- Counsel personnel on personal or military-related matters
- Desk check programs
- Establish performance standards for subordinates

F. Systems Programming Job (STG254, N=20). As with the Senior Systems Programmers, the members of this job maintain the operating systems used by applications programmers, except they do not perform supervisory functions. Incumbents in this job perform an average of 58 tasks and have an average paygrade of E-5. They average over 4 years in the career ladder and 9 years TAFMS.

Representative tasks performed by members of this job are:

- Interrogate memory locations using consoles
- Analyze program dumps
- Change communications-computer software by patching
- Code computer programs in assembly languages
- Perform calculations within a numbering system, other than decimal, using pencil and paper
- Modify communicates-computer systems applications
- Analyze system dumps
- Perform character conversions using character conversion charts, such as ASCII to BCD or ASCII to EBCDIC

G. Data Base Administration Job (STG322, N=16). A data base is a large collection of data in a computer, organized so that it can be expanded, updated, and retrieved rapidly for various uses. Members of this job perform tasks that pertain to data base administration. They have an average paygrade of E-5 and 12 years TAFMS. Incumbents average over 6 years in the career ladder and just under 3 years in their present job. They perform an average of 53 tasks.

Representative tasks for this job group include:

- Identify data base deficiencies
- Analyze data base requirements
- Modify data base structures
- Review data base deficiencies
- Develop data base update procedures
- Evaluate data base management systems
- Resize data base areas
- Design data base specifications

II. SMALL COMPUTER PROGRAMMING CLUSTER (STG055). Comprising the second largest group in the sample survey, members of the Small Computer Programming group are distinguished from other groups by the number of tasks they perform on "other than mainframes." The majority of their time is spent performing general communications-computer systems activities (53 percent). Members in this cluster represent 19 percent of the total survey sample. The predominate paygrades are E-4 and E-5 (27 and 25 percent respectively). There are 30 civilians in this cluster (21 in paygrade GS-11 and 9 in paygrade GS-9). Incumbents in this cluster perform an average of 58 tasks.

SMALL COMPUTER PROGRAMMING CLUSTER	
Number of members	386
Percent of total sample	19%
Average number of tasks performed	59
Average time in present job	2 yrs
Average time in career field	6 yrs
Average TAMS	11 yrs
Predominant paygrade	E-4/E-5

Representative tasks for this cluster include:

- Correct stoppages or malfunctions on communications-computer systems peripheral equipment, other than mainframe
- Backup files on systems, other than mainframes
- Prepare peripheral equipment for operation on systems other than mainframes
- Perform communications-computer system initialization procedures on systems, other than mainframes
- Perform communications-computer systems recovery procedures on systems, other than mainframes
- Transfer programs or data from one media to another media on systems, other than mainframes

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- Backup files on systems, other than mainframes
- Format data storage media on systems, other than mainframes
- Assist customers in resolving computer software
- Perform user maintenance on communications-computer systems equipment

Representative task modules of this cluster include:

TM	Module Title	No. of Tasks	Percent Time Spent	Percent Members Performing
0001	Small Computers	16	24	24
0010	User Coordination	6	4	28
0017	Upper-level Supervisors	5	3	31
0002	Systems Analysts	4	2	33

As shown by the above data, members in the Small Computer Programming cluster spend 24 percent of their job time performing tasks in the "Small Computers" module. This is clearly the dominant task module for this job as the next module, User Coordination, accounts for only 4 percent of incumbents' job time. The third module in terms of overall job time is the "Upper-level" Supervisor's module. While this module accounts for only 3 percent of incumbents' overall job time, it is comprised of only five tasks—indicating that this module represents an important, albeit small, segment of the Small Computer Programming cluster. And in conclusion, as in the General Programming cluster, members of the Small Computer Programming cluster are performing tasks pertaining to systems analysis.

Two jobs were identified in the Small Computer cluster. One job is more senior to the other and data indicates they perform three times as many tasks, but when comparing the two jobs together, those tasks performed by the smaller group are also being performed by the larger group. There are numerous personnel in these two groups that indicate they are Local Area Network Administrators or Senior Local Area Network Administrators. It must be pointed out that these two jobs are not normally functions of AFSC 3C0X2, but are functions of AFSC 3C0X1, Communications-Computer Systems Operators. As suspected, survey data indicates they are being performed by some Communications-Computer Systems Programming personnel. The Air Force Functional Manager for AFSC 3C0X2 requested the data be screened for jobs of this type as steps are being taken to insure personnel in this AFSC perform only programming tasks.

III. **SUPERVISION CLUSTER (STG047, N=148)**. The Supervision cluster contains 148 respondents and represents 7 percent of the total survey sample. Members of this job, in addition to performing general communication-computer systems activities, indicate they spend the majority of their time performing in a supervisory capacity. As shown in Table 3, duty areas A. Organizing and Planning; B. Directing and Implementing; C. Inspecting and Evaluating; and D. Training, represent 54 percent of Supervision cluster members' overall job time. Supervision cluster members perform an average of 71 tasks.

SUPERVISION CLUSTER	
Number of members	148
Percent of total sample	7%
Average number of tasks performed	71
Average time in present job	2 yrs
Average time in career field	8 yrs
Average TAMS	15 yrs
Predominant paygrades	E-7

Representative tasks for this job include:

- Counsel personnel on personal or military related matters
- Determine or establish work priorities
- Write EPRs
- Evaluate personnel for compliance with performance standards
- Establish performance standards for subordinates
- Plan or schedule work assignments
- Develop work methods or procedures
- Interpret policies, directives, or procedures for subordinates
- Write recommendations for awards or decorations
- Determine OJT requirements

Representative task modules for this job include:

TM	Module Title	No. of Tasks	Percent Time Spent	Percent Members Performing
0018	Shop Supervisors	20	26	26
0017	Upper-level Supervisors	5	6	32
0019	NCOICs	4	2	34
0001	Small Computers	16	6	40

These data show the emphasis of this job toward supervision, particularly those tasks related to shop supervisors, upper-level supervisors, and NCOICs. Combined, these three task modules and small computers account for 40 percent of their cumulative job time.

Respondents holding this job are, generally, more experienced in the career ladder. The average paygrade is E-7, and members have almost 15 years TAFMS. Forty-eight percent of these incumbents are assigned to group or squadron-level duty positions.

As in the Small Computer Programming cluster, two jobs were also identified in the Supervision cluster. The larger of the two groups contains 89 members and they are primarily first-line supervisors. The smaller group has 34 incumbents who perform only a third of the number of tasks of the larger group (40 tasks to 91 tasks, respectively), and are the more senior group of the two. Based upon tasks performed, the larger group is more management oriented than the smaller group. Customer related tasks are performed by the more senior group while more subordinate related tasks are being performed by the first-line supervisors.

IV. REQUIREMENTS ANALYSIS INDEPENDENT JOB (STG039, N=31). The 31 members of this independent job represent 2 percent of the total survey sample. The majority of tasks performed by incumbents in this independent job pertain to software planning and design activities. They spend 48 percent of their job time (see Table 3) developing, reviewing, or analyzing requirements. The remainder of their time is spent on general communications-computer systems activities, software development, implementation and maintenance, and organizing and planning duties. On average, members of the Requirements Analysis independent job perform 37 tasks.

REQUIREMENTS ANALYSIS INDEPENDENT JOB	
Number of members	31
Percent of total sample	2%
Average number of tasks performed	37
Average time in present job	1.5 yrs
Average time in career field	7 yrs
Average TAMS	11 yrs
Predominant paygrades	E-5/E-7

Representative tasks for this independent job include:

- Analyze communications-computer systems interface or integration requirements
- Assist functional users in conceptualizing or defining communications-computer systems requirements
- Analyze data base requirements
- Review communications-computer systems software requirements
- Analyze communications-computer systems output requirements
- Assist systems development personnel in conceptualizing or defining requirements
- Analyze communications-computer systems processing capabilities
- Analyze input or output products of other functional systems for interface with existing systems
- Develop software development plans

Representative task modules for this job include:

TM	Module Title	No of Tasks	Percent Time Spent	Percent Members Performing
0007	User Requirements	10	22	58
0008	Plans and Requirements	7	6	28
0017	Upper-level Supervisors	5	3	28
0011	Systems Program Review	7	3	18

These data clearly indicate that the members of the Requirements independent job are requirements oriented. Tasks performed pertaining to user requirements, plans and requirements and systems program review show that incumbents are supporting their users, whether they be from their own unit, other base units, or from throughout a MAJCOM.

The majority (81 percent) of Requirements Analysis incumbents are military. Six members are civilians with paygrades ranging from GS-9 through GS-11. Table 4 shows expanded background data across career ladder jobs.

Respondents in this cluster average over 11 years TAFMS and over 6 years time in career ladder. Forty-six percent (23 percent each) have a paygrade of E-5 or E-7.

V. **TEST ANALYSIS INDEPENDENT JOB** (STG442, N=17). Members of this independent job spend 50 percent of their job time performing tasks related to software testing, quality assurance, and configuration management functions. They prepare, analyze, develop and evaluate test plans, and participate in acceptance tests. Incumbents also run verification and validation tests, and unit tests on communications-computer systems. Performing an average of 34 tasks, 71 of the members of this independent job indicate they work at the Group level or below. Also, 88 percent indicated testing as their primary responsibility, while another 6 percent indicated having a primary responsibility of quality assurance.

TEST ANALYSIS INDEPENDENT JOB	
Number of members	17
Percent of total sample	Less than 1%
Average number of tasks performed	34
Average time in present job	1.4 yrs
Average time in career field	5 yrs
Average TAMS	8 yrs
Predominant paygrades	E-4

Representative tasks performed by members of this independent job are:

- Prepare communications-computer systems test plans

- Analyze communications-computer systems test results

- Prepare program test specifications or instructions

- Develop inputs to communications-computer systems test plans

- Prepare communications-computer systems input test data

- Evaluate communications-computer systems test plans

- Participate in communications-computer system software acceptance test

- Run validation and verification tests on communications-computer systems

- Prepare plans to test software interface

Representative task modules of this independent job include:

TM	Module Title	No. of Tasks	Percent Time Spent	Percent Members Performing
0013	System Tests	10	36	81
0008	Plans and Requirements	7	3	10
0012	Change Requests	7	3	15
0017	Upper-level supervisors	5	2	20

Members of the Test Analysis independent job perform tasks in task modules that relate to testing system programs to insure those programs are what the user required. Data indicates that 42 percent of these incumbents' job time is spent on system tests, plans and requirements, and change requests modules.

Test Analysis members have an average military paygrade of E-4, and their time in the career ladder averages over 5 years with just under 8 years TAFMS. The three civilians in this independent job group are all GS-11s.

VI. SECURITY CLUSTER (STG049, N=62). Members of the Security cluster have an average paygrade of E-4 and average 5 years in the career ladder. Over one-half of these incumbents belong to Air Combat Command. Thirty-one percent of their job time is spent performing tasks related to maintaining both administrative and physical security. In performing administrative security functions, they sign for, store or safeguard, and distribute classified materials, while securing sites or equipment would be examples of their performing physical security activities. Security cluster members perform and average of 42 tasks.

SECURITY CLUSTER	
Number of members	62
Percent of total sample	3%
Average number of tasks performed	41
Average time in present job	1.6 yrs
Average time in career field	5 yrs
Average TAMS	8 yrs
Predominant paygrades	E-4

Representative tasks performed by members of this cluster include:

- Store or safeguard classified materials
- Annotate or stamp sensitive unclassified or classified information, other than messages
- Sign receipts for classified materials
- Escort visitors through facilities
- Designate classified materials for destruction
- Destroy classified or sensitive unclassified material
- Inspect classified material
- Secure site or equipment for classified processing
- Prepare classified materials for mail, delivery, or distribution

Representative task modules of this cluster include:

TM	Module Title	No. of Tasks	Percent Time Spent	Percent Members Performing
0018	Shop Supervisors	20	26	70
0017	Upper-level Supervisors	5	6	70
0019	NCOICs	4	2	38
0001	Small Computers	16	6	29

Two jobs were identified in the Security cluster. The smaller job consists of 10 members all assigned to either Tinker AFB OK or Langley AFB VA. Incumbents located at Tinker AFB design communications-computer programs (some classified) for Airborne Warning and Control Systems, while members stationed at Langley AFB test these programs. This smaller of the two jobs contains 10 members, and they range in paygrades of E-3 through E-6.

Examples of tasks performed by this small Security cluster job are:

- Store or safeguard classified materials
- Analyze communications-computer systems test results
- Participate in communications-computer systems software acceptance tests
- Run unit tests on communications-computer systems
- Run validation and verification tests on communications-computer systems

The 18 members of the larger group perform tasks pertaining to mainly maintaining security (34 percent of job time). They range in paygrade from E-3 to E-7 and are the core job of the Physical Security cluster. They perform an average of 64 tasks.

Examples of tasks performed by this larger Physical Security cluster job are:

- Store or safeguard classified materials
- Annotate or stamp sensitive unclassified or classified information, other than messages
- Inspect classified material
- Distribute classified materials
- Determine authorization to access files

VII. RESIDENT COURSE INSTRUCTION INDEPENDENT JOB (STG416, N=18). Members of this independent job spend the majority of their job time (60 percent) performing tasks related to training. Eighty-nine percent (18 members) have a "T" prefix of instructor and conduct resident course instruction at technical schools or operating locations. Performing an average of 30 tasks, incumbents of this independent job have 4 years in their present job (the longest of any cluster or job identified in the survey sample) and over 8 years in the career ladder. They average 11 years TAFMS and an average paygrade of E-5.

RESIDENT COURSE INSTRUCTION INDEPENDENT JOB	
Number of members	20
Percent of total sample	1%
Average number of tasks performed	30
Average time in present job	4 yrs
Average time in career field	8 yrs
Average TAMS	11 yrs
Predominant paygrades	E-5

Representative tasks performed by members of this independent job include:

- Develop lesson plans
- Conduct resident course classroom training
- Administer or score tests
- Write test questions
- Develop training aids
- Maintain training records, charts, or graphs
- Counsel trainees on training progress
- Counsel personnel on personal or military-related matters
- Determine resident course training requirements

Representative task modules of this independent job include:

TM	Module Title	No of Tasks	Percent Time Spent	Percent Members Performing
0020	Instructors	6	39	94
0015	Calculating	4	2	27
0018	Shop Supervisors	20	20	28
0003	Coding	17	6	17

VIII. CONTRACTING INDEPENDENT JOB (STG100, N=16). The 16 members of the Contracting independent job indicate spending 56 percent of their job time performing functions pertaining to supply or contracting. Nine of the sixteen members of this independent job are civilians (three are GS-09 and six are GS-11) in occupational series 334. These civilians average 5 years time in the occupational series and 17 years total federal civil service. The seven military incumbents in this independent job have an average paygrade of E-7, 9 years in the career field, and over 14 years TAFMS. Top tasks performed deal with preparing purchase request, confirming contract terms, monitoring contract compliance, and

CONTRACTING INDEPENDENT JOB	
Number of members	16
Percent of total sample	Less than 1%
Average number of tasks performed	16
Average time in present job	1.8 yrs
Average time in career field	9 yrs
Average TAMS	14 yrs
Predominant paygrades	E-7

requirements for modifications or amendments to contracts. This is a very narrow job, involving an average of only 16 tasks (see Appendix A for tasks performed).

Representative tasks performed by members of this independent job are:

- Prepare procurement documents, such as purchase requests
- Confirm contract terms, such as delivery date or quantity
- Monitor compliance with contracts
- Determine requirements for modifications or amendments to contracts
- Deliver open purchase contracts
- Establish procedures for equipment maintenance or other contractual support devices
- Maintain base-level purchase account records, such as local purchase
- Evaluate bids, quotations, or proposals for contract awards
- Review communications-computer systems excess or availability bulletins

Representative task modules of this independent job include:

TM	Module Title	No. of Tasks	Percent Time Spent	Percent Members Performing
0026	Contracting	6	42	70
0017	Upper-level Supervisors	5	6	26
0002	Systems Analysts	4	3	15

These data clearly show the emphasis of this independent job on contracting duties and tasks, since incumbents spend 42 percent of their job time in that one task module. As expected, supervisory and system analysis task are present in this independent job.

Comparison of Current Group Descriptions to Previous Study

The results of the specialty job analysis were compared to the previous OSR, AFPT 90-241-811, dated October 1988. This analysis was conducted in a joint survey and analysis with then AFSC 491X1 (3C0X1). The group descriptions for AFSC 3C0X2 were concentrated in one specialty job, Computer Programmers. Jobs identified in this cluster can be found in the current analysis. Applications Programmers, Programmer Analysts, Data Base Analysts, Assembly Language Programmers, and Computer Operations Specialists jobs all compare to those found in the current General Programmers cluster. The jobs of Security Programmers and Systems Testing Personnel align with the Security cluster and Test Analysis independent job found in the 1995 survey. The remainder of the then AFSC 491X2 personnel were not identified specifically in any of the other clusters and jobs reported in the 1988 analysis.

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Summary

In summary, structure analysis reveals the Communications-Computer Systems Programming career ladder to be fairly homogenous, with the jobs split up between the different programming tiers. For example, 56 percent of respondents are in the General Programming cluster and perform similar tasks based upon the communications-computer system(s) being programmed or maintained. The major difference between the General Programming cluster and the Small Computer cluster is that the tasks being performed are mainly on systems "other than the mainframe" by personnel in the Small Computer cluster. In every job identified in these two clusters, tasks performance centers around the following duties: software development, implementation, and maintenance; general communications-computer systems activities; software planning and design activities; and software testing, quality assurance and configuration management functions. Task performance in the Supervision and Security clusters is specific to the jobs identified, but tasks pertaining to the four duties listed above are also being performed. The independent jobs identified, while specific to the job, also indicate respondents spend similar amounts of time on tasks in the four duties listed above.

SKILL AND EXPERIENCE ANALYSIS

Analysis of Military DAFSC Groups

An analysis of DAFSC groups, in conjunction with the analysis of the career ladder structure, is an important part of each occupational survey. DAFSC analysis examines differences in tasks performed between skill levels. This information may then be used to evaluate how well career ladder documents, such as <u>AFMAN 36-2108 Specialty Descriptions</u>, reflect what career ladder personnel are actually doing in the field.

The distribution of AFSC 3C0X2 skill-level groups across career ladder clusters and jobs is displayed in Table 5. As can be seen, very high numbers of DAFSC 3C032, 3C052, and 3C072 members are performing in the core cluster of the career ladder, the General Programming cluster. As personnel progress through the career ladder, they do begin to move into traditional management and supervisory roles, but not in the typical career progression pattern. Members of this AFSC remain highly technical from the 3-skill level through the 7-skill level.

Table 6 offers a better perspective by displaying the relative percent time spent on each duty across skill-level groups. As expected, 3-skill level personnel have little to do with supervisory functions (duties A, B, and C), but 5- and 7-skill level members also spend a smaller than usual amount of time in these same duties. As can be seen in Table 6, members of all three skill level

TABLE 5

DISTRIBUTION OF 3C0X2 SKILL-LEVEL MEMBERS
ACROSS CAREER LADDER JOBS

JOB	3C032 (N=164)	3C052 (N=940)	3C072 (N=723)	Civilians (N=181)
GENERAL PROGRAMMING CLUSTER	113	565	338	104
SMALL COMPUTER PROGRAMMING CLUSTER	19	188	150	29
SUPERVISION CLUSTER	0	29	110	9
REQUIREMENTS ANALYSIS INDEPENDENT JOB	1	13	11	6
TEST ANALYSIS INDEPENDENT JOB	3	7	4	3
SECURITY CLUSTER	6	34	18	4
RESIDENT COURSE INSTRUCTION INDEPENDENT JOB	0	12	6	0
CONTRACTING INDEPENDENT JOB	0	2	5	9
NOT GROUPED	23	90	81	17

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TABLE 6

TIME SPENT ON DUTIES BY MEMBERS OF SKILL-LEVEL GROUPS
(RELATIVE PERCENT OF JOB TIME)

DUTIES	DAFSC 3C032 (N=164)	DAFSC 3C052 (N=940)	DAFSC 3C072 (N=723)
A ORGANIZING AND PLANNING	3	4	8
B DIRECTING AND IMPLEMENTING	*	2	5
C INSPECTING AND EVALUATING	*	2	5
D TRAINING	1	4	6
E PERFORMING GENERAL COMMUNICATIONS-COMPUTER SYSTEMS ACTIVITIES	27	29	27
F PERFORMING SOFTWARE PLANNING AND DESIGN ACTIVITIES	12	12	12
G PERFORMING SOFTWARE DEVELOPMENT, IMPLEMENTATION, AND MAINTENANCE	43	35	23
H PERFORMING SOFTWARE TESTING, QUALITY ASSURANCE AND CONFIGURATION MANAGEMENT FUNCTIONS	8	7	7
I PERFORMING MAGNETIC MEDIA LIBRARY FUNCTIONS	1	*	*
J MAINTAINING SECURITY	4	4	4
K PERFORMING SUPPLY OR CONTRACTING FUNCTIONS	*	*	1

* Indicates less than 1 percent

groups spend about the same relative amount of time on duties E, F, and G. These three duties represent the essence of jobs being performed by members of the Communications-Computer Systems Programming career ladder. Specific skill level group discussions are presented below.

Descriptions and Comparisons of Military Skill Level Groups

DAFSC 3C032. Three-skill level members perform an average of 48 tasks and average 2 years in the specialty. Most hold the grade of airman first class. Table 5 shows that 113 of the 164 members in this group perform in the General Programming cluster. Eighty-two percent of their job time is spent performing tasks that pertain to performing general communications-computer systems activities, software planning and design activities, and software development, implementation, and maintenance (see Table 6). Table 7 lists representative tasks these members perform. Examples of these tasks include debugging computer programs, compiling or assembling programs, coding computer programs in high-level compiler languages, and assisting customers in resolving computer software malfunctions or problems

DAFSC 3C052. Five-skill level members comprise the largest group in this career ladder. The 940 members of this group perform an average of 60 tasks and average 4 years in the career ladder. Nearly half of these members (45 percent) are staff sergeants. As with 3-skill level members, over half of the 5-skill level airmen (565) are members of the General Programming cluster (see Table 5). DAFSC 3C052 members spend 76 percent of their time performing tasks relating to the same three duties as their 3-skill counterparts, those being duties E, F, and G (see Table 6). Table 8 lists representative tasks for these incumbents. Many of these tasks are the same as those performed by 3-skill level personnel.

DAFSC 3C072. Seven-skill level personnel perform an average of 81 tasks and average 8 years in the career ladder. Members comprise the second largest group in the career ladder. The 723 members of this group have an average grade of technical sergeant. As with the 3- and 5-skill level groups, the majority of these groups' time (62 percent) is spent on tasks pertaining to duties E, F, and G (see Table 6). While spending a small amount of time (18 percent) on supervisory duties A, B, and C, indicating that even though they are 7-skill level personnel, they remain highly technical in their job performance. Table 6 shows 6 percent of their job time is spent on duty D, Training. Representative tasks performed by 7-skill level personnel are listed in Table 9. As with 5-skill personnel, many of the tasks performed by these members are the same as the 3-skill level group.

Table 10 shows tasks which best distinguish between 5- and 7-skill level members. A higher percentage of 7-skill level members perform those typical supervisory tasks, reflecting the first-line supervisory role of these more senior personnel.

TABLE 7

REPRESENTATIVE TASKS PERFORMED BY AFSC 3C032 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=164)
G261	Debug computer programs	68
G256	Compile or assemble programs	68
G251	Code computer programs in high-level compiler languages	65
E95	Assist customers in resolving computer software malfunctions or problems	54
G262	Desk check programs	53
G260	Correct syntax errors	53
G289	Modify communications-computer systems applications	50
G288	Maintain source code listings	41
G314	Review source code listings	40
G254	Code error handling routines	40
E187	Transfer programs or data from one media to another media on systems other than mainframes	38
G268	Develop or maintain communications-computer systems user manuals	38
F232	Design main program algorithms or logic	37
E97	Backup files on systems, other than mainframes	35
E172	Review disks directories on systems, other than mainframes	35
E123	Initiate processing, such as batched job, on-line, or off-line	35
G253	Code data base access routines	35
E170	Review computer programs for adherence to programming standards	35
E116	Edit input or output data	33
G243	Access software support libraries	33
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	32
G313	Review software problem reports	28
G323	Write functional applications programs	27
G255	Code job control run streams in job control languages	27
H355	Run unit tests on communications-computer systems	26

TABLE 8

REPRESENTATIVE TASKS PERFORMED BY AFSC 3C052 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=940)
G261	Debug computer programs	64
E95	Assist customers in resolving computer software malfunctions or problems	62
G256	Compile or assemble programs	61
G251	Code computer programs reports	60
G262	Desk check programs	52
G260	Correct syntax errors	49
E97	Backup files on systems, other than mainframes	46
E187	Transfer programs or data from one media to another media on systems other than mainframes	45
G288	Maintain source code listings	43
G289	Modify communications-computer systems applications	42
G254	Code error handling routines	42
G314	Review source code listings	39
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	39
E172	Review disks directories on systems, other than mainframes	39
F232	Design main program algorithms or logic	38
G243	Access software support libraries	37
F202	Assist functional users in conceptualizing or defining communications-computer systems requirements	37
G281	Explain communications-computer systems errors to customers	37
G253	Code data base access routines	36
G268	Develop or maintain communications-computer systems user manuals	35
E123	Initiate processing, such as batched job, on-line, or off-line	35
E156	Prepare input or output data	34
E116	Edit input or output data	34
E107	Correct stoppage or malfunctions on communications-computer systems peripheral equipment on systems, other than mainframes	33
A3	Determine or establish work priorities	33

TABLE 9

REPRESENTATIVE TASKS PERFORMED BY AFSC 3C072 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=723)
E955	Assist customers in resolving computer software malfunctions or problems	68
A3	Determine of establish work priorities	63
B24	Counsel personnel on personal or military-related matters	55
A9	Develop work methods or procedures	54
G261	Debug computer programs	52
E97	Backup files on systems, other than mainframes	50
C60	Write EPRs	49
G256	Compile or assemble programs	48
G251	Code computer programs in high-level compiler languages	48
A11	Establish organizational policies, such as office instructions (OIs) or standard operating procedures (SOPs)	48
E187	Transfer programs or data from one media to another media on systems other than mainframes	46
A16	Plan or prepare briefings	46
E172	Review disk directories on systems, other than mainframes	45
D66	Conduct OJT	45
A17	Plan or schedule work assignments	44
A4	Determine requirements for space, personnel, equipment, or supplies	44
F202	Assist functional users in conceptualizing or defining communications-computer systems requirements	43
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	43
G262	Desk Check programs	43
C51	Evaluate personnel for compliance with performance standards	42
E120	Format data storage media on systems, other than mainframes	42
E146	Perform communications-computer system initialization procedures on systems, other than mainframes	42
G260	Correct syntax errors	41
C61	Write recommendations for awards or decorations	41
A12	Establish performance standards for subordinates	41

TABLE 10

TASKS WHICH BEST DIFFERENTIATE BETWEEN
DAFSC 3C052 AND DAFSC 3C072 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS		3C052 (N=63)	3C0721 (N=175)	DIFFERENCE
B24	Counsel personnel on personal or military-related matters	18	54	36
C60	Write APRs	15	49	34
C61	Write recommendations for awards or decorations	11	41	30
A17	Plan or schedule work assignments	13	43	30
C51	Evaluate personnel for compliance with performance standards	12	42	30
A3	Determine or establish work priorities	33	63	30

AFMAN 36-2108 Specialty Descriptions Analysis

Survey data were compared to the AFMAN 36-2108 Specialty Descriptions for AFSC 3C0X2, Communications-Computer Systems Programming Apprentices, Journeymen, and Craftsmen, dated 31 October 1994. The descriptions for the skill levels were accurate, depicting the technical aspects of the job, as well as the supervisory responsibilities previously described in the DAFSC analysis. Once again, this document does not specify the individual skill level descriptions but combines the 3-, 5-, and 7-skill level job functions into one overall description. The descriptions also capture the primary responsibilities of AFSC 3C0X1 members in the applicable clusters and jobs identified by the job structure analysis process.

Analysis of Civilian Paygrade Groups

As with the military DAFSC analysis, an analysis of civilian paygrade groups, in conjunction with the analysis of the career ladder structure, reflect what these personnel are actually doing in the field. Civilian skill and experience analysis examine differences in tasks performed between identified paygrade groups.

The distribution of Occupational Series 334 civilian paygrade groups across career ladder clusters and jobs is displayed in Table 11. As can be seen, the highest percentages of each civilian paygrade group are performing the core job of the career ladder, the General Programming cluster. Civilians do not mirror the military career progression pattern, where members follow a typical path from technical duties to management and supervision duties. Rather, most civilian Occupational Series 334 personnel tend to remain in the General Programming cluster as they progress—even as their responsibilities increase.

Table 12 offers another perspective by displaying the relative percent time spent on each duty across civilian paygrade groups. As expected, all identified groups concentrate on performing tasks related to duties E, F, and G, which make up the core of the General Programming clusters.

Descriptions and Comparisons of Civilian Paygrade Groups.

GS-09. The 33 members of this group perform an average of 58 tasks and average 4 years and 4 months in their current occupational series. Table 11 indicates most GS-09 personnel are members of the General Programming cluster (40 percent). Table 12 data show these members spend 70 percent of their time performing tasks relating to general communications-computer systems activities, software planning and design activities, and software development, implementation, and maintenance. Representative tasks performed by GS-09s are listed in Table 13, and many are the same as those performed by their military counterparts. Examples of tasks performed include: reviewing communications-computer systems requirements, assisting customers in resolving computer software malfunctions or problems, and debugging computer programs.

TABLE 11

DISTRIBUTION OF CIVILIAN OCCUPATIONAL SERIES 334 MEMBERS
ACROSS CAREER LADDER JOBS (PERCENT)

JOB	GS-09 (N=33)	GS-11 (N=136)	GS-12 (N=9)	OTHER (N=4)
GENERAL PROGRAMMING CLUSTER	40	61	77	25
COMPUTER PROGRAMMING CLUSTER	21	15	11	25
SUPERVISION CLUSTER	9	4	0	25
REQUIREMENTS ANALYSIS INDEPENDENT JOB	6	2	11	25
TEST ANALYSIS INDEPENDENT JOB	0	2	0	0
SECURITY CLUSTER	6	2	0	0
RESIDENT COURSE INSTRUCTION INDEPENDENT JOB	0	0	0	0
CONTRACTING INDEPENDENT JOB	9	4	0	0
NOT GROUPED	9	10	0	0

* Other includes 3 GS-07s and 1 GM-13

NOTE: Columns may not add to 100 percent due to rounding

TABLE 12

TIME SPENT ON DUTIES BY MEMBERS OF CIVILIAN OCCUPATIONAL SERIES 334 GROUPS
(RELATIVE PERCENT OF JOB TIME)

DUTIES	GS-09 (N=33)	GS-11 (N=136	GS-12 (N=9)
A ORGANIZING AND PLANNING	5	5	4
B DIRECTING AND IMPLEMENTING	2	2	2
C INSPECTING AND EVALUATING	1	2	1
D TRAINING	2	1	2
E PERFORMING GENERAL COMMUNICATIONS-COMPUTER SYSTEMS ACTIVITIES	30	24	19
F PERFORMING SOFTWARE PLANNING AND DESIGN ACTIVITIES	13	15	21
G PERFORMING SOFTWARE DEVELOPMENT, IMPLEMENTATION, AND MAINTENANCE	27	34	40
H PERFORMING SOFTWARE TESTING, QUALITY ASSURANCE AND CONFIGURATION MANAGEMENT FUNCTIONS	6	9	8
I PERFORMING MAGNETIC MEDIA LIBRARY FUNCTIONS	*	*	*
J MAINTAINING SECURITY	5	3	2
K PERFORMING SUPPLY OR CONTRACTING FUNCTIONS	9	4	*

* Denotes less than 1 percent

NOTE: Columns may not add to 100 percent due to rounding

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TABLE 13

REPRESENTATIVE TASKS PERFORMED BY OCCUPATIONAL SERIES 334
GS-09 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=33)
E166	Review communications-computer systems requirement documentation (CSRD)	56
E95	Assist customers in resolving computer software malfunctions or problems	56
A3	Determine or establish work priorities	52
G281	Explain communications-computer errors to customers	49
A9	Develop work methods or procedures	46
E97	Backup files on systems, other than mainframes	46
G261	Debug computer programs	42
F202	Assist functional users in conceptualizing or defining communications-computer systems requirements	42
F199	Analyze interrelationships among files, documents, and data items	39
G256	Compile or assemble programs	39
G258	Coordinate new systems releases with users	39
G288	Maintain source code listings	36
H328	Answer inquiries from customers, such as computer job or message status	36
G221	Review unit safety training programs	87
I258	Review initial mishap findings to determine reportability	87
J274	Coordinate mishap investigations with appropriate agencies	87

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_GS-11_. This is the largest civilian paygrade group represented in the survey sample. These members average 72 tasks performed and 7 years, 5 months in the their current occupational series. Table 11 data show 61 percent of the 136 members in this group perform in the General Programming cluster. Performing tasks pertaining to duties E, F, and G accounts for 80 percent of their overall job time (see Table 12), and numerous tasks listed in Table 14 are the same as those performed by GS-09 group members.

_GS-12_. The 9 members of this group perform an average of 88 tasks and average over 6 years in their current occupational series. While 77 percent of the surveyed GS-12 personnel are members of the General Programming cluster (see Table 11), Table 12 indicates these GS-12 members also spend 80 percent of their time performing in duties E, F, and G. Table 15 shows they perform many of those tasks performed by their GS-09/11 counterparts. This would indicate that the jobs being performed by civilian members in occupational series 334 is the about the same.

The majority of civilian personnel can be found in the General Programming cluster (63 percent) while another 18 percent are members of the Small Computer cluster. Over half of the Contracting independent job (9 of 16) are civilians. A comparison of percent members performing tasks across the three civilian paygrades was accomplished with little difference noted.

Training Analysis

Occupational survey data are sources of information which can be used to assist in the development of relevant training programs for entry-level personnel. Factors used to evaluate entry-level Communications-Computer Systems Programming training include jobs being performed by first-enlistment personnel, overall distribution of first-enlistment personnel across career ladder jobs, percent first-job (1-24 month TAFMS) and first-enlistment (1-48 months TAFMS) members performing specific tasks or using specific equipment items, ratings of how much TE tasks should receive in formal training, and ratings of relative TD.

First-Enlistment Personnel

In this study, there are 493 members in their first enlistment (1-48 TAFMS), representing 25 percent of the survey sample. Figure 3 shows the distribution of these members in the clusters and independent jobs identified in the survey analysis. As displayed in Table 16, approximately 95 percent of their duty time is devoted to technical task performance, the majority of which is contained in four duties: performing software development, implementation, and maintenance (39 percent); general communications-computer systems activities (31 percent); software planning and design activities (11 percent); and software testing, quality assurance and configuration management functions (8 percent). The vast majority of first-enlistment personnel are involved in the day-to-day communications-computer systems programming activities. Table 17 displays some of the tasks performed by first-enlistment personnel. Examples include: debug computer programs and compile or assemble programs.

TABLE 14

REPRESENTATIVE TASKS PERFORMED BY OCCUPATIONAL SERIES 334
GS-11 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=136)
E95	Assist customers in resolving computer software malfunctions or problems	70
G261	Debug computer programs	64
G256	Compile or assemble programs	61
G288	Maintain source code listings	55
G289	Modify communications-computer systems applications	54
A3	Determine or establish work priorities	54
E123	Initiate processing, such as batched job, on-line, or off-line	51
F202	Assist functional users in conceptualizing or defining communications-computer systems requirements	51
G260	Correct syntax errors	50
H328	Answer inquiries from customers, such as computer job or message status	50
G251	Code computer programs in high-level compiler languages	49
F232	Design main program algorithms or logic	48
G262	Desk check programs	48
G258	Coordinate new systems releases with users	48
E116	Edit input or output data	46
G133	Evaluate lock out/tag out procedures	83

TABLE 15

REPRESENTATIVE TASKS PERFORMED BY OCCUPATIONAL SERIES 334
GS-12 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=9)
G261	Debug computer programs	89
E123	Initiate processing, such as batched job, on-line, or off-line	89
F231	Design input or output standards	89
G281	Explain communications-computer systems errors to customers	89
G262	Desk check programs	78
E95	Assist customers in resolving computer software malfunctions or problems	78
G289	Modify communications-computer systems applications	78
G314	Review source code listings	78
F195	Analyze communications-computer systems output requirements	78
F202	Assist functional users in conceptualizing or defining communications-computer systems requirements	78
F223	Prepare or revise program specifications	78
F197	Analyze data base requirements	78
G288	Maintain source code listings	78
G260	Correct syntax errors	78
H348	Prepare communications-computer systems input test data	78
E128	Isolate problems on production runs	68

TABLE 16

RELATIVE PERCENT OF TIME SPENT ACROSS DUTIES BY FIRST-ENLISTMENT
AFSC 3C0X2 PERSONNEL

DUTIES	PERCENT TIME SPENT
A ORGANIZING AND PLANNING	3
B DIRECTING AND IMPLEMENTING	1
C INSPECTING AND EVALUATING	*
D TRAINING	12
E PERFORMING GENERAL COMMUNICATIONS-COMPUTER SYSTEMS ACTIVITIES	31
F PERFORMING SOFTWARE PLANNING AND DESIGN ACTIVITIES	11
G PERFORMING SOFTWARE DEVELOPMENT, IMPLEMENTATION, AND MAINTENANCE	39
H PERFORMING SOFTWARE TESTING, QUALITY ASSURANCE AND CONFIGURATION MANAGEMENT FUNCTIONS	6
I PERFORMING MAGNETIC MEDIA LIBRARY FUNCTIONS	1
J MAINTAINING SECURITY	4
K PERFORMING SUPPLY OR CONTRACTING FUNCTIONS	*

* Denotes less than 1 percent

NOTE: Time Spent does not total 100 percent due to rounding

TABLE 17

REPRESENTATIVE TASKS PERFORMED BY
FIRST-ENLISTMENT 3C0X2 PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=493)
G261	Debug computer programs	65
G256	Compile or assemble programs	64
G251	Code computer programs in high-level compiler languages	62
E95	Assist customers in resolving computer software malfunctions or problems	59
G262	Desk check programs	52
G260	Correct syntax errors	51
G254	Code error handling routines	42
G289	Modify communications-computer systems applications	42
G288	Maintain source code listings	41
E187	Transfer programs or data from one media to another media on systems other than mainframes	41
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	41
E97	Backup files on systems, other than mainframes	40
G314	Review source code listings	40
E172	Review disk directories on systems, other than mainframes	36
G281	Explain communications-computer systems errors to customers	35

GENERAL PROGRAMMING
CLUSTER 58%

SMALL
COMPUTER PROGRAMMING
CLUSTER 19%

OTHER
3%

NOT GROUPED
10%

OTHER: INCLUDES SUPERVISION AND SECURITY CLUSTERS; SECURITY,
REQUIREMENTS ANALYSIS, TEST ANALYSIS, RESIDENT
COURSE INSTRUCTION INDEPENDENT JOBS
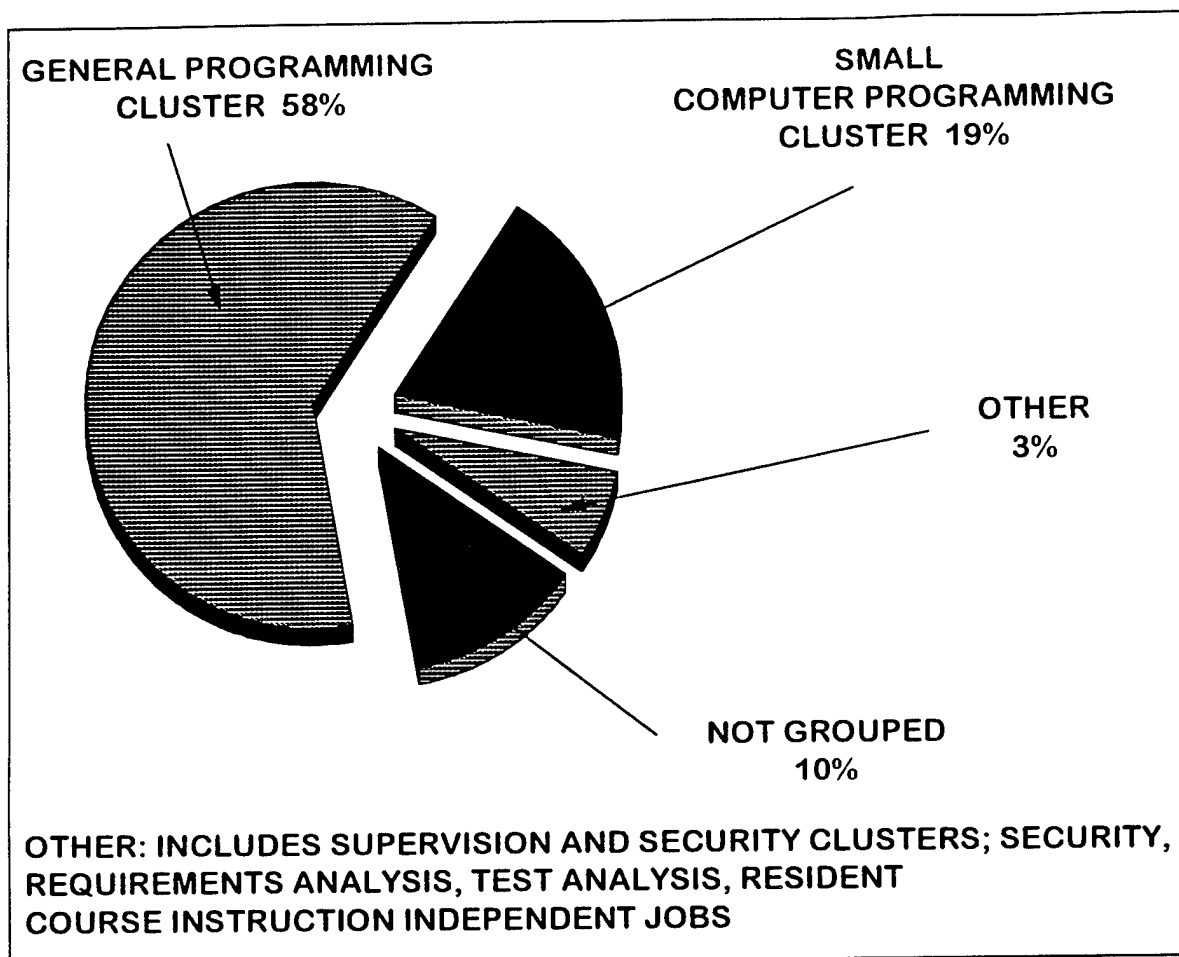
Figure 3. AFSC 3C0X2 members with 1-48 months TAFMS (N=493) in clusters and
independent jobs.

Training Emphasis (TE) and Task Difficulty (TD) Data

TE and TD data are secondary task factors that can help training development personnel decide which tasks to emphasize for entry-level training. These ratings, based on the judgments of senior career ladder NCOs at operational units, provide training personnel with a rank-ordering of those tasks considered important for airmen with 1-48 months TAFMS training (TE) and a measure of the relative difficulty of those tasks (TD). When combined with data on the percentages of first-enlistment personnel performing tasks, comparisons can be made to determine if training adjustments are necessary. For example, tasks receiving high ratings on both task factors (TE and TD), accompanied by moderate to high percentages performing, may warrant resident training. Those tasks receiving high task factor ratings, but low percentages performing, may be more appropriately planned for OJT programs within the career ladder. Low task factor

ratings may highlight tasks best omitted from training for new personnel. These decisions must be weighed against percentages of personnel performing the tasks, command concerns, and criticality of the tasks.

To assist training development personnel, AFOMS developed a computer program that uses these task factors and the percentage of first-enlistment personnel performing tasks to produce Automated Training Indicators (ATI). ATIs correspond to training decisions listed and defined in the Training Decision Logic Table found in Attachment 1, AETCR 52-22. ATIs allow training developers to quickly focus attention on those tasks which are most likely to qualify for resident course consideration.

Tasks having the highest TE ratings for AFSC 3C0X2 personnel with 1-48 months TAFMS are listed in Table 18. Included for each task are the percentage of 1-24 months TAFMS performing the task, the percentage of 1-48 months TAFMS performing the task, and the TD rating. As illustrated in Table 19, tasks with the highest TE ratings deal with coding computer programs in high-level compiler languages, debugging computer programs, and compiling or assembling programs. These tasks are performed by high percentages of 1-24 months and 1-48 months TAFMS personnel, and most have high TD ratings.

Table 19 lists the tasks having the highest TD ratings. The percentages of 1-24 months and 1-48 months TAFMS, 5- and 7-skill level personnel performing, and TE ratings are also included for each task. Most tasks with high TD ratings are technical functions dealing with writing operating systems programs, analyzing system dumps, and designing operating systems interface or integration specifications. Most of the tasks with high TD ratings have average to high TE ratings and are performed by relatively low to high percentages (2 to 71 percent) of 1-24 months and 1-48 months TAFMS, and 5 and 7-skill level members. Those tasks with high TD ratings, high percentages of members performing, and high TE ratings deal with analyzing program dumps and designing main program algorithms or logic.

Various lists of tasks, accompanied by TE and TD ratings, are contained in the TRAINING EXTRACT package and should by reviewed in detail by technical school personnel. For a more detailed explanation of TE and TD ratings, see Task Factor Administration in the **SURVEY METHODOLOGY** section of this report.

STS Analysis

A comprehensive review of STS 3C0X2 was made by comparing survey data to STS elements. Technical school personnel from the 333d Training Squadron, Keesler AFB MS matched JI tasks to appropriate STS sections and subsections. A complete computer listing displaying the percent members performing tasks, TE and TD ratings for each task, along with the STS matching, has been forwarded to the technical school for their further review of training documents. STS elements with performance objectives were reviewed for TE, TD, and percent members performing information, as stipulated in AETCR 52-22, dated 17 February 1989. STS paragraphs containing general knowledge information, subject-matter knowledge requirements, or

TABLE 18

TASKS WITH HIGHEST TRAINING EMPHASIS RATINGS

TASKS		TRG EMP	PERCENT MEMBERS PERFORMING		TSK DIF
			1-24 MOS	1-48 MOS	
G251	Code computer programs in high-level compiler languages	7.69	60	62	6.20
G261	Debug computer programs	7.56	62	65	6.20
G256	Compile or assemble programs	6.85	62	64	4.53
G254	Code error handling routines	6.82	38	42	6.08
G262	Desk check programs	6.77	51	52	5.23
G253	Code data base access routines	6.13	32	34	5.98
G323	Write functional applications programs	6.10	22	26	6.25
G260	Correct syntax errors	5.82	47	51	4.42
G320	Write data base retrieval procedures	5.77	14	19	5.94
G326	Write utility programs	5.41	24	32	6.23
G289	Modify communications-computer systems applications	5.26	38	42	5.91
G255	Code job control run streams in job control languages	5.18	21	24	5.55
G294	Participate in structured walk-through of communications-computer systems programs	5.18	24	24	5.00
G243	Access software support libraries	5.05	31	32	4.48
F234	Design problem solutions using aids, such as program design languages, structure charts, or data flow diagrams	5.00	27	25	6.14
G252	Code computer programs in translator or interpreter languages	4.97	16	18	6.00
G290	Modify data base structures	4.97	21	25	5.93
G321	Write data base runstreams utilizing data base routines, such as query languages	4.82	8	15	5.83
G284	Incorporate reusable software components	4.82	28	27	5.51

TE MEAN = 2.13; S.D. = 1.43 (HIGH = 3.56)
TD MEAN = 5.00; S.D. = 1.00

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TABLE 19

TASKS WITH HIGHEST TASK DIFFICULTY RATINGS

TASKS		TSK DIF	PERCENT MEMBERS PERFORMING				TRG EMP
			1-24 MOS	1-48 MOS	5-LVL	7-LVL	
G325	Write operating systems programs	7.41	7	8	6	6	2.46
G250	Code computer programs in assembly languages	7.41	9	11	11	10	3.62
G248	Analyze system dumps	7.15	13	16	13	14	3.03
F233	Design operating systems interface or integration specifications	7.02	9	10	9	12	2.77
F236	Design remote terminal networks	6.87	2	50	6	71	1.23
G247	Analyze program dumps	6.87	24	29	27	23	4.13
F228	Design communications-computer systems software interface or integration specifications	6.86	7	9	9	12	1.72
G322	Write data communications programs	6.76	8	10	9	9	3.15
D74	Develop resident course or career development course (CDC) curriculum materials	6.70	1	1	1	2	.26
F213	Develop software development plans	6.55	15	16	15	22	2.67
F229	Design data base specifications	6.55	15	17	23	25	2.97
F214	Develop software implementation or conversion plans	6.55	12	12	14	22	2.23
F225	Prepare recommendations for size and capacity of proposed communications-computer systems equipment	6.53	4	4	9	19	1.08
F215	Develop software management plans	6.52	3	4	7	13	1.26
F212	Develop models to simulate functional requirements	6.50	6	9	10	12	2.15
F232	Design main program algorithms of logic	6.50	29	33	38	34	4.67
K402	Evaluate bids, quotations, or proposals for contract awards	6.48	1	0	2	6	.15
F203	Assist systems development personnel in conceptualizing of defining requirements	6.46	16	20	23	35	3.90

TD MEAN = 5.00; S.D. = 1.00
TE MEAN = 2.13; S.D. = 1.43 (HIGH = 3.56)

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supervisory responsibilities were not reviewed. Typically, STS elements matched to tasks which have sufficiently high TE and TD ratings, and are performed by at least 20 percent of personnel in appropriate experience of skill-level groups (such as first-enlistment (1-48 months) TAFMS, and 5- and 7-skill level groups), should be considered for inclusion in the STS. Likewise, elements matched to tasks with less than 20 percent performing in all of these groups should be considered for deletion from the STS.

STS paragraphs containing performance information were reviewed. Of the 46 performance coded items in the STS, only four were found to be unsupported by occupational survey data. Data for these four items can be found in Table 20. Two of these tasks deal with analyzing problem solutions or data base management systems, while the other two focus on managing contracts and acquiring configuration management techniques. Also, STS paragraph 5f, coded to 2b for the 3-skill level course, is not supported by survey data (15 percent performing for first job personnel and 16 percent for first-enlistment personnel). This task is supported by survey data only at the 7-skill level. If required in the STS, perhaps the 3-skill level course column should be dashed. Training personnel and SMEs should review these areas to determine if inclusion in future revisions to the STS is warranted.

Tasks not matched to any element of the STS are listed at the end of the STS computer listing. These were reviewed to determine if there were any tasks concentrated around any particular functions or jobs. Examples of technical tasks performed by at least 20 percent of STS target group respondents, but which are not referenced to any STS element, are displayed in Table 21. While some of these tasks are high in TE and low in TD, percent members performing figures indicate training personnel and SMEs should review these and other unreferenced tasks to determine STS inclusion.

It should be noted that at the time the STS match was being performed, the document was being refined for inclusion in the Career Field Education and Training Plan. Training personnel and SMEs should review any changes that were made to the STS to insure they are supported by survey data.

Plan of Instruction (POI) Analysis

JI tasks were matched to related training objectives in POI E3ABR3C032-000/ E3AZR3C032-001, dated 4 January 1994, with assistance from the 333d Training Squadron SMEs. The method employed was similar to that of the STS analysis. The data examined included percent members performing data for first-job (1-24 months TAFMS) personnel, first-enlistment (1-48 months TAFMS) personnel, and TE and TD ratings. ATI ratings for each task were also used.

TABLE 20

EXAMPLES OF STS ITEMS NOT SUPPORTED BY OSR DATA

STS REFERENCE/TASKS	3 LVL COURSE PROF CODE	TNG EMP	1ST JOB (N=180)	1ST ENL (N=492)	5-SKILL LEVEL (N=940)	7-SKILL LEVEL (N=723)	TSK DIF**
5b(2) Analyze problem solution statements	2b						
F212 Develop models to simulate functional requirements		2.15	6	9	10	12	6.50
9E(1) Identify (Data Structures)	1b						
G245 Analyze data base management systems (DBMSs) memory or storage allocations		2.69	6	7	10	17	5.91
11a Manage Contracts	-				A	2b	
G275 Evaluate contractor provided change packages		1.51	4	7	8	16	5.88
K397 Confirm contract terms, such as delivery date or quantity		.56	2	2	5	11	4.44
K401 Establish procedures for equipment maintenance or other contractual support services		.36	1	1	3	7	6.15
K402 Evaluate bids, quotations, or proposals for contract awards		.15	1	0	2	6	6.48
11b. Acquire configuration management techniques	-					2b	
F215 Develop software management plans		1.26	3	4	7	13	6.52
H335 Draft or write configuration management audit reports		.87	0	0	2	3	5.78

* Training emphasis has an average of 2.13, and a standard Deviation of 1.43 (High TE = 3.56)

** Average task difficulty is 5.00, and the Standard Deviation is 1.00

TABLE 21

EXAMPLES OF TECHNICAL TASKS PERFORMED BY 20 PERCENT OR MORE 3C0X2
GROUP MEMBERS AND NOT REFERENCED TO THE STS

PERCENT MEMBERS PERFORMING

TASKS	1ST ENL (N=493)	DAFSC 3C052 (N=940)	DAFSC 3C072 (N=723)	TNG EMP*	TASK DIF**
E97 Backup files on systems, other than mainframes	40	46	50	4.74	3.63
E187 Transfer programs or data from one media to another media on systems other than mainframes	41	45	46	3.79	3.97
E123 Initiate processing, such as batched job, on-line, or off-line	35	35	37	3.79	3.71
E120 Format data storage media on systems, other than mainframes	34	34	42	3.56	3.47

*   Training emphasis has an average of 2.13, and a Standard Deviation of 1.43 (High TE = 3.56)
** Average task difficulty is 5.00, and the Standard Deviation is 1.00

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POI blocks, units of instruction, and learning objectives were compared to the standard set forth in AETCR 52-22, dated 17 February 1989 (30 percent or more of the first-enlistment group performing tasks trained, along with sufficiently high TE and TD ratings on those tasks). By this guidance, tasks trained in the course which do not meet these criteria should be considered for elimination from the formal course, if not justified on some other acceptable basis.

Review of the tasks matched to the POI revealed that the POI is well supported by occupational survey data. Only one criterion objective with a performance standard is not supported by survey data. Even though criterion objectives VII 4b (using data base specification sheet) and VII-2, (design a relational data base) do not meet performance standards, tasks matched to it do have high TE and TD ratings. Task F197, Analyze data base requirements, has a TE rating of 3.92 and a TD rating of 6.21. High TE ratings for this survey are those that exceed 3.56, and high TD ratings are those that are over 6.00. This task should be reviewed by training personnel for possible deletion from the POI and possible inclusion in formal OJT.

Some technical tasks performed by over 30 percent of first-enlistment personnel were not matched to the POI. Examples of these tasks with survey data are listed in Table 22. In addition to members performing these functions, some of these tasks are rated high in TE and TD. Training personnel and SMEs should review these and other unreferenced tasks to determine if training should be provided in the formal course.

Job Satisfaction Analysis

An examination of job satisfaction indicators can give career ladder managers a better understanding of factors that may affect the job performance of career ladder airmen. Therefore, the survey booklet included attitude questions covering job interest, perceived utilization of talents and training, sense of accomplishment from work, and reenlistment intentions. The responses of the current survey sample were analyzed by making several comparisons: (1) among TAFMS groups of the AFSC 3C0X2 career ladder and a comparative sample of personnel from other Direct Support career ladders surveys in 1993 (AFSCs 1T1X1, 2R0X1, and 2R1X1); (2) between current and previous survey TAFMS groups; and (3) across specialty groups identified in the SPECIALTY JOBS section of the report.

Table 23 compares first-enlistment (1-48 months TAFMS), second-enlistment (49-96 months TAFMS), and career (97+ months TAFMS) group data to corresponding enlistment groups from other Direct Support Groups surveyed in 1993. These data give a relative measure of how the job satisfaction of AFSC 3C0X2 personnel compares with similar Air Force specialties. Communications-Computer systems personnel reported generally about the same or higher job satisfaction than members of the comparative sample. The first-enlistment group rated their perceived use of talents 1 percent higher than their counterparts, however, the second-enlistment and career groups rated lower than their counterparts in this category. Ratings of all three groups for perceived use of training are very low compared to that of the comparative sample. This is an indication that personnel are not being used in areas they were trained for. While sense of accomplishment from job ratings are about the same as the comparative sample for the three

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TABLE 22

EXAMPLES OF TECHNICAL TASKS PERFORMED BY 30 PERCENT OR MORE 3C0X2
FIRST-ENLISTMENT PERSONNEL AND NOT REFERENCED TO THE POI

TASKS	TNG EMP*	1ST ENL PERCENT MEMBERS PERFORMING (N=493)	ATL	TSK DIF**
G253 Code data base routines	6.13	34	18	5.98
E95 Assist customers in resolving computer software malfunctions or problems	4.46	59	18	5.56
F202 Assist functional users in conceptualizing or defining communications-computer system requirements	4.23	32	18	6.44
G288 Maintain source code listings	4.23	41	18	4.36
F200 Analyze methods of accessing data bases	4.18	30	18	5.69
E156 Prepare input or output data	4.18	32	18	4.23
F195 Analyze communications-computer systems output requirements	4.00	30	18	4.71
G268 Develop or maintain communications-computer systems user manuals	4.00	35	18	5.59

*   Training emphasis has an average of 2.13, and a Standard Deviation of 1.46 (High TE = 3.56)

**   Average task difficulty rating is 5.00, and the Standard Deviation is 1.00

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TABLE 23

COMPARISON OF JOB SATISFACTION INDICATORS FOR AFSC 3C0X2 TAFMS GROUPS IN
CURRENT STUDY TO A COMPARATIVE SAMPLE (PERCENT MEMBERS RESPONDING)

	1-48 MONTHS		49-96 MONTHS		97+ MONTHS	
	3C0X2 (N=493)	COMP SAMPLE (N=767)	3C0X2 (N=501)	COMP SAMPLE (N=700)	3C0X2 (N=1033)	COMP SAMPLE (N=1514)
EXPRESSED JOB INTEREST						
INTERESTING	72	65	76	72	76	76
SO-SO	15	21	12	17	13	15
DULL	13	12	12	11	11	9
DID NOT RESPOND	0	2	0	0	0	10
PERCEIVED USE OF TALENTS						
FAIRLY TO VERY WELL	63	62	63	67	61	66
EXCELLENT TO PERFECT	15	7	17	12	18	17
NONE TO VERY LITTLE	22	30	20	20	21	17
DID NOT RESPOND	0	1	0	1	0	0
PERCEIVED USE OF TRAINING						
FAIRLY TO VERY WELL	48	76	53	69	50	62
EXCELLENT TO PERFECT	10	15	8	14	9	17
NONE TO VERY LITTLE	42	9	40	17	41	21
DID NOT RESPOND	0	0	0	0	0	0
SENSE OF ACCOMPLISHMENT FROM JOB						
SATISFIED	70	72	72	75	70	75
NEUTRAL	11	16	7	10	7	9
DISSATISFIED	19	12	21	15	22	16
DID NOT RESPOND	0	0	0	0	0	0
REENLISTMENT INTENTIONS						
YES OR PROBABLY YES	61	64	65	79	50	70
NO OR PROBABLY NO	39	36	34	21	10	10
WILL RETIRE	0	0	0	0	39	19
DID NOT RESPOND	0	0	1	0	1	1

Comparative data are from the following Direct Support AFSCs surveyed in 1993: 1T1X1, 2R0X1, and 2R1X1

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groups, reenlistment intentions across the three groups is lower. With the exception of perceived use of training and reenlistment intentions, the percentages of positive responses in these comparisons reflect a career ladder where personnel appear to be satisfied with their jobs.

An indication of changes in job satisfaction perceptions within the career ladder is provided in Table 24, which presents TAFMS group data for 1993 survey respondents, and data from respondents in the last OSR of the career ladder in 1988 (491X2). Generally, perceptions with job satisfaction have remained the same, with the exception of the 1-48 months TAFMS group, which decreased quite a bit (from 85 percent in the last OSR to 63 percent in the current OSR). Perceived use of talents have decreased for all three groups in the current OSR when compared to those respondents in the 1988 survey. When comparing perceived use of training responses, and as also indicated in the above comparative sample, all three groups again indicate they are not being utilized in areas they have been trained in. Data from respondents indicates that sense of accomplishment perceptions have decreased from the last OSR, with the exception of second-enlistment personnel (49-96 months), and reenlistment intentions have increased for all except for the 97+ months group (down from 72 to 70). As was the indication from the comparative sample groups above, the overall perception from personnel in the current survey is that their training is not being well used. This could account for the decrease in perceived use of talents also.

Table 25 presents job satisfaction data for civilians in Occupational Series 334. Overall, members across all paygrades indicated very positive job satisfaction responses. A comparative sample could not be accomplished with civilians in this occupational series as they were not included in the 1988 survey.

In addition, job satisfaction data for identified job groups and clusters are provided at Table 26. Again, members across all identified groups provided generally positive job satisfaction responses, with the exception of those personnel in the Security cluster. Members of this cluster reported much lower responses when referring to expressed job interest and the other areas, except reenlistment intentions, when compared to other job groups and clusters. Again, as in the comparative sample and TAFMS tables, perceived use of training responses across the groups are low. Reenlistment intentions for most groups is average. The low responses for the Contracting cluster for reenlistment responses is a result of over one-half of the members in this group being civilians.

IMPLICATIONS

As explained in the **INTRODUCTION**, this survey was conducted primarily to identify changes that have occurred in the AFSC 3C0X2 career ladder and the relates civilian career field (Occupational Series 334) over the last 5 years. Data compiled from this survey support the military and civilian career structures. Specialty Job Analysis indicates no clear delineation between the military and civilian personnel, as both military and civilian respondents are

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TABLE 24

COMPARISON OF JOB SATISFACTION INDICATORS FOR AFSC 3C0X2 TAFMS GROUPS IN CURRENT STUDY TO 1988 AFSC 491X2 STUDY (PERCENT MEMBERS RESPONDING)

	1-48 MONTHS		49-96 MONTHS		97+ MONTHS	
	1995 (N=493)	1988 (N=231)	1995 (N=301)	1988 (N=133)	1995 (N=1033)	1988 (N=138)
EXPRESSED JOB INTEREST						
INTERESTING	72	82	76	74	76	78
SO-SO	15	11	12	10	13	11
DULL	13	7	12	15	11	11
DID NOT RESPOND	0	0	0	0	0	0
PERCEIVED USE OF TALENTS						
FAIRLY TO VERY WELL	63	85	63	73	61	80
EXCELLENT TO PERFECT	15	0	17	0	18	0
NONE TO VERY LITTLE	22	15	20	27	21	20
PERCEIVED USE OF TRAINING						
FAIRLY TO VERY WELL	48	74	53	62	50	63
EXCELLENT TO PERFECT	10	0	8	0	9	0
NONE TO VERY LITTLE	42	26	40	34	41	36
SENSE OF ACCOMPLISHMENT FROM JOB						
SATISFIED	70	76	72	65	66	68
NEUTRAL	11	10	7	5	9	7
DISSATISFIED	19	14	21	29	25	24
DID NOT RESPOND	0	0	0	0	0	0
REENLISTMENT INTENTIONS						
YES OR PROBABLY YES	61	47	65	53	70	72
NO OR PROBABLY NO	39	53	34	47	11	11
WILL RETIRE	0	0	0	0	18	17
DID NOT RESPOND	0	0	2	0	1	0

TABLE 25

COMPARISON OF CIVILIAN JOB SATISFACTION INDICATORS FOR
OCCUPATIONAL SERIES 334
(PERCENT MEMBERS RESPONDING)

	GS-09 (N=33)	GS-11 (N=136)	GS-12 (N=9)
EXPRESSED JOB INTEREST			
INTERESTING	82	82	67
SO-SO	6	13	22
DULL	9	4	11
DID NOT RESPOND	3	1	0
PERCEIVED USE OF TALENTS			
FAIRLY TO VERY WELL	73	71	78
EXCELLENT TO PERFECT	9	19	11
NONE TO VERY LITTLE	15	10	11
DID NOT RESPOND	3	0	0
PERCEIVED USE OF TRAINING			
FAIRLY TO VERY WELL	73	65	56
EXCELLENT TO PERFECT	6	16	11
NONE TO VERY LITTLE	18	18	33
DID NOT RESPOND	3	1	0
SENSE OF ACCOMPLISHMENT FROM JOB			
SATISFIED	73	77	67
NEUTRAL	9	10	22
DISSATISFIED	15	13	11
DID NOT RESPOND	3	0	0

TABLE 26

COMPARISON OF JOB SATISFACTION INDICATORS FOR
IDENTIFIED JOB GROUPS AND CLUSTERS (PERCENT MEMBERS RESPONDING)

	GENERAL PROGRAMMING CLUSTER (N=1120)	SMALL COMP-PROG CLUSTER (N=386)	SUPERVISION CLUSTER (N=148)	REQUIREMENTS ANALYSIS CLUSTER (N=31)
EXPRESSED JOB INTEREST				
INTERESTING	81	76	72	74
SO-SO	12	12	16	10
DULL	7	12	13	16
DID NOT RESPOND	0	0	0	0
PERCEIVED USE OF TALENTS				
FAIRLY TO VERY WELL	87	59	53	74
EXCELLENT TO PERFECT	19	18	18	10
NONE TO VERY LITTLE	14	23	29	16
DID NOT RESPOND	0	0	0	0
PERCEIVED USE OF TRAINING				
FAIRLY TO VERY WELL	62	34	42	55
EXCELLENT TO PERFECT	12	8	5	13
NONE TO VERY LITTLE	26	57	53	32
DID NOT RESPOND	1	0	0	0
SENSE OF ACCOMPLISHMENT FROM JOB				
SATISFIED	77	72	63	61
NEUTRAL	7	5	10	16
DISSATISFIED	16	22	27	23
DID NOT RESPOND	0	1	0	0
REENLISTMENT INTENTIONS				
YES OR PROBABLY YES	60	64	64	52
NO OR PROBABLY NO	23	19	8	16
WILL RETIRE	8	9	22	13
DID NOT RESPOND/DOES NOT APPLY	10	8	6	19

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TABLE 26 (CONTINUED)

COMPARISON OF JOB SATISFACTION INDICATORS FOR
IDENTIFIED JOB GROUPS AND CLUSTERS
(PERCENT MEMBERS RESPONDING)

	TEST ANALYSIS CLUSTER (N=17)	SECURITY CLUSTER (N=62)	RESIDENT COURSE INSTRUCTION CLUSTER (N=18)	CONTRACTING CLUSTER (N=16)
EXPRESSED JOB INTEREST				
INTERESTING	65	48	61	81
SO-SO	24	11	33	13
DULL	12	48	6	6
DID NOT RESPOND	0	0	0	0
PERCEIVED USE OF TALENTS				
FAIRLY TO VERY WELL	59	44	83	69
EXCELLENT TO PERFECT	12	2	6	13
NONE TO VERY LITTLE	29	55	11	19
DID NOT RESPOND	0	0	0	0
PERCEIVED USE OF TRAINING				
FAIRLY TO VERY WELL	35	34	61	69
EXCELLENT TO PERFECT	6	3	11	0
NONE TO VERY LITTLE	59	63	28	31
DID NOT RESPOND	0	0	0	0
SENSE OF ACCOMPLISHMENT FROM JOB				
SATISFIED	65	48	67	94
NEUTRAL	18	11	11	0
DISSATISFIED	18	40	22	6
DID NOT RESPOND	0	0	0	0
REENLISTMENT INTENTIONS				
YES OR PROBABLY YES	47	73	72	31
NO OR PROBABLY NO	35	16	17	6
WILL RETIRE	0	5	11	6
DID NOT RESPOND/DOES NOT APPLY	18	6	6	56

represented to some extent in most of the identified jobs and clusters. Furthermore, <u>AFMAN 36-2108 Specialty Descriptions</u> for the AFSC 3C0X2 career ladder accurately portray the clusters and jobs identified in this study.

Skill-level analysis revealed a highly technical AFSC up through and including the 7-skill level. Some supervisory functions are being performed at the 7-skill level but not as many as those found in other Air Force Specialties.

No serious job satisfaction problems appear to exist within this specialty. For the most part, military and civilian respondents appear satisfied with their jobs. However, members perceive their use of talents and training to be lower than that of a comparative sample of similar Air Force personnel surveyed in 1993. AFSC 3C0X2 military reenlistment intentions are lower than those of the comparative sample.

The findings of this OSR come directly from the survey data collected from Communications-Computer Systems Programmer personnel worldwide. These data are readily available to training and utilization personnel, functional managers, and other interested parties having a need for such information. Much of the data are compiled into extracts which are excellent tools in the decision-making process. These data extracts should be used when training or utilization decisions are made.

APPENDIX A

SELECTED REPRESENTATIVE TASKS PERFORMED BY
MEMBERS OF CAREER LADDER JOBS

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TABLE A1

GENERAL PROGRAMMING CLUSTER
(STG045)

TASKS		PERCENT MEMBERS PERFORMING (N=1,120)
G261	Debug computer programs	92
G256	Compile or assemble programs	86
G251	Code computer programs in high-level compiler languages	83
G262	Desk check programs	76
G260	Correct syntax errors	73
E95	Assist customers in resolving computer software malfunctions or problems	67
G289	Modify communications-computer systems applications	66
G288	Maintain source code listings	65
G254	Code error handling routines	64
G314	Review source code listings	62
F232	Design main program algorithms or logic	60
G253	Code data base access routines	54
G281	Explain communications-computer systems errors to customers	53
F231	Design input or output formats	53
G268	Develop or maintain communications-computer systems user manuals	52
G243	Access software support libraries	51
E170	Review computer programs for adherence to programming standards	49
G323	Write functional applications programs	49
E123	Initiate processing, such as batched job, on-line, or off-line	48
G326	Write utility programs	47
G259	Correct data entry errors	46
F234	Design problem solutions using aids, such as program design languages, structure charts, or data flow diagrams	45
G255	Code job control run streams in job control languages	41
G319	Write data base programs	41
G318	Write applications programs utilizing data manipulation languages	38

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TABLE A2

ENTRY LEVEL PROGRAMMING JOB
(STG477)

TASKS		PERCENT MEMBERS PERFORMING (N=51)
G251	Code computer programs in high-level compiler languages	98
G261	Debug computer programs	96
G256	Compile or assemble programs	94
G262	Desk check programs	69
G260	Correct syntax errors	67
G254	Code error handling routines	61
G289	Modify communications-computer systems applications	39
G268	Develop or maintain communications-computer systems user manuals	29
G243	Access software support libraries	29
G314	Review source code listings	25
G326	Write utility programs	24
G288	Maintain source code listings	24
G259	Correct data entry errors	24
G313	Review software problem reports	24
G269	Develop or maintain program maintenance manuals	22
G323	Write functional applications programs	20
G257	Coordinate new system releases with configuration management	20
G284	Incorporate reusable software components	18
G253	Code data base access routines	18
F232	Design main program algorithms or logic	16
G294	Participate in structured walk-through of communications-computer systems programs	16
E95	Assist customers in resolving computer software malfunctions or problems	12
G318	Write applications programs utilizing data manipulation languages	12
G247	Analyze program dumps	12
B27	Direct utilization of equipment	8

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TABLE A3

SMALL COMPUTER REPAIR JOB
(STG519)

TASKS		PERCENT MEMBERS PERFORMING (N=23)
G251	Code computer programs in high-level compiler languages	100
E187	Transfer programs or data from one media to another media on systems other than mainframes	100
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	100
E172	Review disk directories on systems, other than mainframes	100
G256	Compile or assemble programs	96
G261	Debug computer programs	96
E101	Check operational status of equipment	96
E120	Format data storage media on systems, other than mainframes	96
G260	Correct syntax errors	87
E158	Prepare peripheral equipment for operation on systems other than mainframes	87
E148	Perform communications-computer systems recovery procedures on systems, other than mainframes	87
E107	Correct stoppages or malfunctions on communications-computer systems peripheral equipment on systems, other than mainframe	83
E116	Edit input or output data	83
E153	Perform user maintenance on communications-computer systems equipment	83
E146	Perform communications-computer system initialization procedures on systems, other than mainframes	83
G314	Review source code listings	78
E89	Align files on disks on systems, other than mainframes	78
G288	Maintain source code listings	78
E95	Assist customers in resolving computer software malfunctions or problems	74
E162	Request systems information using consoles	74
G262	Desk check programs	74
E161	Remove or replace microcomputer internal components	74
G254	Code error handling routines	70
J374	Assign user identifications (IDs) or passwords	70
G323	Write functional applications programs	65

TABLE A4

ON-THE-JOB TRAINERS JOB
(STG624)

TASKS		PERCENT MEMBERS PERFORMING (N=10)
A9	Develop work methods or procedures	100
G261	Debug computer programs	100
D70	Determine OJT requirements	100
G262	Desk check programs	100
G251	Code computer programs in high-level compiler languages	100
B24	Counsel personnel on personal or military-related matters	100
G260	Correct syntax errors	100
D66	Conduct OJT	90
D80	Evaluate progress of trainees	90
E169	Review computer output products for compliance with standards or specifications	90
D69	Counsel trainees on training progress	90
D82	Plan OJT	90
C51	Evaluate personnel for compliance with performance standards	90
E170	Review computer programs for adherence to programming	90
E95	Assist customers in resolving computer software malfunctions or problems	80
D81	Maintain training records, charts, or graphs	80
G316	Train users in communications-computer systems	80
A3	Determine or establish work priorities	80
G256	Compile or assemble programs	80
D79	Evaluate OJT trainees	80
D72	Develop course control documents, such as specialty training standards (STSs)	70
D71	Determine resident course training requirements	70
D76	Direct or implement OJT programs	70
D75	Develop training aids	60
D73	Develop lesson plans	60

TABLE A5

SENIOR SYSTEMS PROGRAMMING JOB
(STG390)

TASKS		PERCENT MEMBERS PERFORMING (N=13)
H328	Answer inquiries from customers, such as computer job or message status	92
E167	Review communications-computer systems software release or patch documentation on mainframes	92
E162	Request systems information using consoles	92
E123	Initiate processing, such as batched job, on-line, or off-line	85
G258	Coordinate new systems releases with users	85
E95	Assist customers in resolving computer software malfunctions or problems	85
G257	Coordinate new system releases with configuration management	85
H349	Prepare communications-computer systems test plans	85
G281	Explain communications-computer systems errors to customers	85
E186	Transfer programs or data from one media to another media on mainframes	85
H332	Determine impact of operating systems errors	85
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	77
H356	Run validation and verification tests on communications-computer systems	77
H334	Develop inputs to communications-computer systems test plans	77
E139	Notify personnel, such as supervisors or remote users, of machine failures or downtime	77
E169	Review computer output products for compliance with standards or specifications	77
G255	Code job control run streams in job control languages	69
G268	Develop or maintain communications-computer systems user manuals	69
G288	Maintain source code listings	69
H343	Inventory software release packages	69
G243	Access software support libraries	62
E145	Perform communications-computer system initialization procedures on mainframes	62
H350	Prepare communications-computer systems test reports	62
H327	Analyze communications-computer systems test results	62
F224	Prepare plans to test software interface	62

TABLE A6

TECHNICAL SUPERVISORS JOB
(STG287)

TASKS		PERCENT MEMBERS PERFORMING (N=49)
G251	Code computer programs in high-level compiler languages	98
G261	Debug computer programs	94
G256	Compile or assemble programs	92
D81	Maintain training records, charts, or graphs	90
B24	Counsel personnel on personal or military-related matters	84
G260	Correct syntax errors	82
C60	Write EPRs	82
D80	Evaluate progress of trainees	80
G262	Desk check programs	78
D66	Conduct OJT	78
C51	Evaluate personnel for compliance with performance standards	78
D69	Counsel trainees on training progress	69
A12	Establish performance standards for subordinates	69
C61	Write recommendations for awards or decorations	69
G254	Code error handling routines	67
G288	Maintain source code listings	67
D79	Evaluate OJT trainees	65
B40	Supervise Communications-Computer Systems Program Journeymen (AFSC 3C052)	63
B39	Supervise Communications-Computer Systems Program Apprentices (AFSC 3C032)	61
G314	Review source code listings	55
G268	Develop or maintain communications-computer systems user manuals	55
G269	Develop or maintain program maintenance manuals	55
F232	Design main program algorithms or logic	53
G289	Modify communications-computer systems applications	51
G323	Write functional applications programs	50

TABLE A7

SYSTEMS PROGRAMMING JOB
(STG254)

TASKS		PERCENT MEMBERS PERFORMING (N=20)
G247	Analyze program dumps	95
G256	Compile or assemble programs	90
G261	Debug computer programs	90
E143	Perform calculations within a numbering system, other than decimal, using pencil and paper	90
G250	Code computer programs in assembly languages	85
G262	Desk check programs	85
E95	Assist customers in resolving computer software malfunctions or problems	80
G 289	Modify communications-computer systems applications	75
E127	Interrogate memory location using consoles	75
G249	Change communications-computer systems software by patching	75
E142	Perform calculations within a numbering system, other than decimal, using electronic means	75
G314	Review source code listings	70
G288	Maintain source code listings	70
G248	Analyze system dumps	70
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	70
G255	Code job control run streams in job control languages	65
E144	Perform character conversions using character conversion charts, such as ASCII to BCD or ASCII to EBCDIC	65
G251	Code computer programs in high-level compiler languages	55
G260	Correct syntax errors	55
E123	Initiate processing, such as batched job, on-line, or off-line	55
E146	Perform communications-computer system initialization procedures on systems, other than mainframes	50
G282	Generate program dumps	50
F232	Design main program algorithms or logic	50
E124	Interpret indicating lights on peripheral equipment on mainframes	50
E138	Mount or dismount data storage units	45

TABLE A8

DATA BASE ADMINISTRATION JOB
(STG322)

TASKS		PERCENT MEMBERS PERFORMING (N=16)
G283	Identify data base deficiencies	100
F197	Analyze data base requirements	88
G276	Evaluate data base currency or accuracy	88
G290	Modify data base structures	88
F239	Review data base specifications	88
G266	Develop data base update procedures	88
F229	Design data base specifications	88
E163	Resize data base areas	88
G301	Review changes to data bases	81
G277	Evaluate data base management systems	81
G301	Review changes to data bases storage allocations	81
G265	Develop data base retrieval procedures	75
F200	Analyze methods of accessing data bases	75
E97	Backup files on systems, other than mainframes	75
G253	Code data base access routines	69
G245	Analyze data base management systems (DBMSs) memory or	69
G306	Review data base recovery, retrieval, or update procedures	69
F230	Design data elements or codes	63
H347	Perform data base conversions	56
G305	Review data base baseline change requests	56
G320	Write data base retrieval procedures	56
F199	Analyze interrelationships among files, documents, and data items	50
G264	Develop data base recovery procedures	50
G264	Develop data base recovery procedures	50
H333	Determine impact of releases or changes to systems data bases	44
F234	Design problem solutions using aids, such as program design languages, structure charts, or data flow diagrams	44

TABLE A9

SMALL COMPUTER PROGRAMMING CLUSTER
(STG055)

TASKS		PERCENT MEMBERS PERFORMING (N=386)
E95	Assist customers in resolving computer software malfunctions or problems	89
E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment	76
E97	Backup files on systems, other than mainframes	68
E101	Check operational status of equipment	66
E148	Perform communications-computer systems recovery procedures on systems, other than mainframes	66
E187	Transfer programs or data from one media to another media on systems other than mainframes	64
E146	Perform communications-computer system initialization procedures on systems, other than mainframes	63
E193	Verify systems hardware configurations	59
E172	Review disk directories on systems, other than mainframes	59
E158	Prepare peripheral equipment for operation on systems other than mainframes	59
E153	Perform user maintenance on communications-computer systems equipment	58
E139	Notify personnel, such as supervisors or remote users, of machine failures or downtime	57
E120	Format data storage media on systems, other than mainframes	57
E161	Remove or replace microcomputer internal components	56
E125	Interpret indicating lights on peripheral equipment on systems, other than mainframes	54
J374	Assign user identifications (IDs) or passwords	54
E93	Assign file or disk space to users or projects	53
E155	Prepare communications-computer systems equipment for operation	47
E162	Request systems information using consoles	46
E89	Align files on disks on systems, other than mainframes	43
E94	Assist customers in preparation of difficulty or trouble reports	38
E107	Correct stoppages or malfunctions on communications-computer 74.87 systems peripheral equipment on systems, other than mainframe	4

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TABLE A10

SUPERVISION CLUSTER
(STG047)

TASKS		PERCENT MEMBERS PERFORMING (N=148)
B24	Counsel personnel on personal or military-related matters	93
A3	Determine or establish work priorities	89
C60	Write EPRs	85
C51	Evaluate personnel for compliance with performance standards	84
A12	Establish performance standards for subordinates	83
B35	Interpret policies, directives, or procedures for subordinates	79
C61	Write recommendations for awards or decorations	78
A17	Plan or schedule work assignments	78
A9	Develop work methods or procedures	78
A21	Schedule personnel for temporary duty (TDY) assignments, leaves, or passes	77
D70	Determine OJT requirements	74
D81	Maintain training records, charts, or graphs	71
A11	Establish organizational policies, such as office instructions (OIs) or standard operating procedures (SOPs)	70
D66	Conduct OJT	66
B40	Supervise Communications-Computer Systems Program Journeymen (AFSC 3C052)	66
A4	Determine requirements for space, personnel, equipment or supplies	66
C52	Evaluate personnel for promotion, demotion, reclassification, or special awards	65
C43	Analyze workload requirements	62
D80	Evaluate progress of trainees	62
A16	Plan or prepare briefings	59
D82	Plan OJT	55
B23	Conduct staff meetings or briefings	54
E95	Assist customers in resolving computer software malfunctions or problems	53
D85	Select or schedule personnel for specialized training	51
B39	Supervise Communications-Computer Systems Program Apprentices (AFSC 3C032)	42

TABLE A11

REQUIREMENTS ANALYSIS INDEPENDENT JOB
(STG039)

TASKS		PERCENT MEMBERS PERFORMING (N=31)
F194	Analyze communications-computer systems interface or integration requirements	81
F202	Assist functional users in conceptualizing or defining communications-computer systems requirements	77
F197	Analyze data base requirements	74
F238	Review communications-computer systems software requirements	71
F195	Analyze communications-computer systems output requirements	71
F203	Assist systems development personnel in conceptualizing or defining requirements	61
F196	Analyze communications-computer systems processing capabilities	48
F198	Analyze input or output products of other functional systems for interface with existing systems	48
F200	Analyze methods of accessing data bases	45
F234	Design problem solutions using aids, such as program design languages, structure charts, or data flow diagrams	45
F199	Analyze interrelationships among files, documents, and data items	45
F209	Determine communications-computer systems input requirements	42
E176	Review technological developments in communications-computer systems	42
F213	Develop software development plans	42
E166	Review communications-computer systems requirement documentation (CSRD)	39
F205	Collect systems analysis background information	32
F237	Review communications-computer systems interface or integration requirements	32
F212	Develop models to simulate functional requirements	29
F232	Design main program algorithms or logic	29
E95	Assist customers in resolving computer software malfunctions or problems	29
F230	Design data elements or codes	26

TABLE A12

TEST ANALYSIS INDEPENDENT JOB
(STG442)

TASKS		PERCENT MEMBERS PERFORMING (N=17)
H349	Prepare communications-computer systems test plans	100
H327	Analyze communications-computer systems test results	94
H351	Prepare program test specifications or instructions	88
H334	Develop inputs to communications-computer systems test plans	88
H348	Prepare communications-computer systems input test data	88
H338	Evaluate communications-computer systems test plans	88
H345	Participate in communications-computer systems software acceptance tests	82
H350	Prepare communications-computer systems test reports	82
H356	Run validation and verification tests on communications-computer systems	76
F224	Prepare plans to test software interface	65
H357	Track status of software discrepancies	59
H355	Run unit tests on communications-computer systems	53
H331	Determine impact of communications-computer applications systems errors	47
G296	Prepare communications-computer systems software test analysis reports	47
E169	Review computer output products for compliance with standards or specifications	41
G300	Prepare software problem reports	41
E141	Participate in communications-computer systems equipment acceptance tests	35
H346	Participate in configuration control boards (CCBs)	35
F238	Review communications-computer systems software requirements	35
H358	Verify use of software standards	29
G257	Coordinate new system releases with configuration management	29
H343	Inventory software release packages	24
G317	Verify problem statements expressed in difficulty or trouble reports	24
H332	Determine impact of operating systems errors	24

TABLE A13

SECURITY CLUSTER
(STG049)

TASKS		PERCENT MEMBERS PERFORMING (N=62)
J394	Store or safeguard classified materials	84
J372	Annotate or stamp sensitive unclassified or classified information, other than messages	82
J393	Sign receipts for classified materials	68
J380	Escort visitors through facilities	66
J376	Designate classified materials for destruction	66
J377	Destroy classified or sensitive unclassified material	56
J379	Distribute classified materials	53
J387	Prepare classified materials for mail, delivery, or distribution	52
J384	Inspect classified material	50
J392	Secure site or equipment for classified processing	48
E123	Initiate processing, such as batched job, on-line, or off-line	45
E97	Backup files on systems, other than mainframes	45
E129	Label data storage media externally	44
E95	Assist customers in resolving computer software malfunctions or problems	42
E187	Transfer programs or data from one media to another media on systems other than mainframes	42
E159	Prepare unclassified media for mail or distribution	35
J386	Place downgrading instructions on classified material	35
E114	Distribute computer produced output products	34
E156	Prepare input or output data	34
J383	Give authorization or deny access to restricted or controlled areas or classified materials	334
E102	Check out data storage media from library	32
J395	Verify authorization to access files	29
E94	Assist customers in preparation of difficulty or trouble reports	27
E116	Edit input or output data	24
H345	Participate in communications-computer systems software acceptance tests	21

TABLE A14

RESIDENT COURSE INSTRUCTION
INDEPENDENT JOB
(STG416)

	TASKS	PERCENT MEMBERS PERFORMING (N=18)
D73	Develop lesson plans	100
D63	Administer or score tests	100
D67	Conduct resident course classroom training	94
D80	Evaluate progress of trainees	94
D84	Score tests	94
D86	Write test questions	89
D75	Develop training aids	89
D69	Counsel trainees on training progress	78
D81	Maintain training records, charts, or graphs	72
B24	Counsel personnel on personal or military-related matters	67
D71	Determine resident course training requirements	44
G261	Debug computer programs	44
E172	Review disk directories on systems, other than mainframes	44
G251	Code computer programs in high-level compiler languages	44
G256	Compile or assemble programs	39
D87	Write training reports	33
D83	Procure training aids, space, or equipment	33
E179	Set or reset computer time clocks on systems other than mainframes	33
A9	Develop work methods or procedures	33
D77	Direct or implement training programs, other than OJT	33
C51	Evaluate personnel for compliance with performance standards	28
D72	Develop course control documents, such as specialty training standards (STSs)	28
E97	Backup files on systems, other than mainframes	28
G262	Desk check programs	28
E170	Review computer programs for adherence to programming standards	22

TABLE A15

CONTRACTING INDEPENDENT JOB
(STG100)

TASKS		PERCENT MEMBERS PERFORMING (N=16)
K397	Confirm contract terms, such as delivery date or quantity	94
K406	Prepare procurement documents, such as purchase requests	88
K404	Monitor compliance with contracts	81
K400	Determine requirements for modifications or amendments to contracts	75
K401	Establish procedures for equipment maintenance or other contractual support services	50
A3	Determine or establish work priorities	43
K398	Deliver open purchase orders	38
K407	Review communications-computer systems excess or availability bulletins	38
E97	Backup files on systems, other than mainframes	38
A9	Develop work methods or procedures	38
K403	Maintain base-level purchase account records, such as local purchase	31
K402	Evaluate bids, quotations, or proposals for contract awards	31
E166	Review communications-computer systems requirement documentation (CSRD)	31
A16	Plan or prepare briefings	31
C62	Write staff studies, surveys, or special reports, other than training reports	31
E104	Compile statistical data	25
K396	Compute communications-computer systems equipment lease charges	19
K399	Determine or establish supply stock requirements	19
H328	Answer inquiries from customers, such as computer job or message status	13
A11	Establish organizational policies, such as office instructions (OIs) or standard operating procedures (SOPs)	13
H343	Inventory software release packages	13
C49	Evaluate maintenance or use of workspace, equipment, or supplies	13
E90	Analyze circuit, communication line, or equipment outage reports	13

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APPENDIX B

LISTING OF MODULES AND TASK STATEMENTS

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These task modules (TMs) were developed in order to organize and summarize the extensive task information of this specialty. The TMs were developed by clustering tasks which are co-performed by the same incumbents. Co-performance is a measure of how probable a task will be performed with another task, based upon the responses of surveyed personnel. For example, if an individual performs one small computer task, the probability is very high that he or she will perform other small computer tasks. Thus, the group of small computer tasks can be considered a "natural group" of associated or related tasks (see TM 001 below). The statistical clustering generally approximates these "natural groupings."

The title of each TM is a best estimate as to the generic subject content of the group of tasks. The TMs are useful for organizing the task data into meaningful units and as a way to concisely summarize the extensive job data. However, TMs are only one way to organize the information. Other strategies may also be valid.

0001   Small Computers

1	E97	Backup files on systems, other than mainframes
2	E101	Check operational status of equipment
3	E107	Correct stoppages or malfunctions on communications-computer systems peripheral equipment on systems, other than mainframe
4	E120	Format data storage media on systems, other than mainframes
5	E125	Interpret indicating lights on peripheral equipment on systems, other than mainframes
6	E146	Perform communications-computer system initialization procedures on systems, other than mainframes
7	E148	Perform communications-computer systems recovery procedures on systems, other than mainframes
8	E153	Perform user maintenance on communications-computer systems equipment
9	E155	Prepare communications-computer systems equipment for operation
10	E158	Prepare peripheral equipment for operation on systems other than mainframes
11	E161	Remove or replace microcomputer internal components
12	E172	Review disk directories on systems, other than mainframes
13	E179	Set or reset computer time clocks on systems other than mainframes
14	E187	Transfer programs or data from one media to another media on systems other than mainframes
15	E188	Troubleshoot causes of machine stops or malfunctions, other than peripheral equipment
16	E193	Verify systems hardware configurations

0002   Systems Analysts

1	E90	Analyze circuit, communication line, or equipment outage reports
2	E91	Analyze computer performance measurement data
3	E92	Analyze or evaluate statistical data
4	E104	Compile statistical data

0003   Coding

1	F232	Design main program algorithms or logic
2	G243	Access software support libraries
3	G251	Code computer programs in high-level compiler languages

0003		Coding (Continued)
4	G253	Code data base access routines
5	G254	Code error handling routines
6	G256	Compile or assemble programs
7	G260	Correct syntax errors
8	G261	Debug computer programs
9	G262	Desk check programs
10	G268	Develop or maintain communications-computer systems user manuals
11	G269	Develop or maintain program maintenance manuals
12	G288	Maintain source code listings
13	G289	Modify communications-computer systems applications
14	G314	Review source code listings
15	G318	Write applications programs utilizing data manipulation languages
16	G323	Write functional applications programs
17	G326	Write utility programs

0004		Input/Output
1	E116	Edit input or output data
2	E123	Initiate processing, such as batched job, on-line, or off-line
3	E156	Prepare input or output data
4	G259	Correct data entry errors

0005		Program Analysts
1	E128	Isolate problems on production runs
2	G246	Analyze job streams
3	G247	Analyze program dumps
4	G255	Code job control run streams in job control languages

0006		Reusable Software
1	G284	Incorporate reusable software components
2	G285	Interpret output or products for users
3	G286	Maintain reusable software components
4	G287	Maintain software support libraries

0007		User Requirements
1	F194	Analyze communications-computer systems interface or integration requirements
2	F195	Analyze communications-computer systems output requirements
3	F196	Analyze communications-computer systems processing capabilities
4	F197	Analyze data base requirements
5	F198	Analyze input or output products of other functional systems for interface with existing systems
6	F199	Analyze interrelationships among files, documents, and data items
7	F200	Analyze methods of accessing data bases

0007		User Requirements (Continued)

8	F202	Assist functional users in conceptualizing or defining communications-computer systems requirements
9	F203	Assist systems development personnel in conceptualizing or defining requirements
10	F204	Brief functional users on capabilities of proposed communications-computer systems equipment

0008		Plans and Requirements

1	F209	Determine communications-computer systems input requirements
2	F213	Develop software development plans
3	F214	Develop software implementation or conversion plans
4	F222	Prepare input or output file specifications
5	F223	Prepare or revise program specifications
6	F224	Prepare plans to test software interface
7	F234	Design problem solutions using aids, such as program design languages, structure charts, or data flow diagrams

0009		Data Base

1	F229	Design data base specifications
2	F230	Design data elements or codes
3	F231	Design input or output formats
4	F239	Review data base specifications
5	G265	Develop data base retrieval procedures
6	G266	Develop data base update procedures
7	G290	Modify data base structures
8	G319	Write data base programs
9	G320	Write data base retrieval procedures
10	G321	Write data base run streams utilizing data base routines, such as query languages

0010		User Coordination

1	E94	Assist customers in preparation of difficulty or trouble reports
2	G257	Coordinate new system releases with configuration management
3	G258	Coordinate new systems releases with users
4	G281	Explain communications-computer systems errors to customers
5	G316	Train users in communications-computer systems
6	H328	Answer inquiries from customers, such as computer job or message status

0011		Systems Program Review

1	G292	Participate in communications-computer systems reviews
2	G293	Participate in peer reviews
3	G294	Participate in structured walk-throughs of communications-computer systems programs
4	G303	Review computer operation manuals

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0011		Systems Program Review (Continued)
5	G308	Review input or output formats
6	G309	Review program maintenance manuals
7	G310	Review program specifications

0012		Change Requests
1	G274	Evaluate communications-computer systems change requests
2	G280	Evaluate software baseline change requests
3	G295	Prepare communications-computer systems change requests
4	G299	Prepare software baseline change requests
5	G300	Prepare software problem reports
6	G311	Review software baseline change requests
7	G313	Review software problem reports

0013		System Tests
1	G296	Prepare communications-computer systems software test analysis reports
2	H327	Analyze communications-computer systems test results
3	H334	Develop inputs to communications-computer systems test plans
4	H338	Evaluate communications-computer systems test plans
5	H348	Prepare communications-computer systems input test data
6	H349	Prepare communications-computer systems test plans
7	H350	Prepare communications-computer systems test reports
8	H351	Prepare program test specifications or instructions
9	H355	Run unit tests on communications-computer systems
10	H356	Run validation and verification tests on communications-computer systems

0014		Quality Assurance
1	E163	Resize data base areas
2	G244	Analyze compatibility of user data bases with DBMS packages
3	G245	Analyze data base management systems (DBMSs) memory or storage allocations
4	G264	Develop data base recovery procedures
5	G276	Evaluate data base currency or accuracy
6	G277	Evaluate data base management systems
7	G283	Identify data base deficiencies
8	G301	Review changes to data bases
9	G306	Review data base recovery, retrieval, or update procedures
10	H347	Perform data base conversions

0015	Calculating	
1	E142	Perform calculations within a numbering system, other than decimal, using electronic means
2	E143	Perform calculations within a numbering system, other than decimal, using pencil and paper
3	E144	Perform character conversions using character conversion charts, such as ASCII to BCD or ASCII to EBCDIC
4	G250	Code computer programs in assembly languages

0016	Mainframe	
1	E88	Align files on disks on mainframes
2	E96	Backup files on mainframes
3	E106	Correct stoppages or malfunctions on communications-computer systems peripheral equipment on mainframes
4	E119	Format data storage media on mainframes
5	E145	Perform communications-computer system initialization procedures on mainframes
6	E147	Perform communications-computer systems recovery procedures on mainframes
7	E167	Review communications-computer systems software release or patch documentation on mainframes
8	E171	Review disk directories on mainframe systems
9	E186	Transfer programs or data from one media to another media on mainframes

0017	Upper-Level Supervisors	
1	A3	Determine or establish work priorities
2	A9	Develop work methods or procedures
3	A11	Establish organizational policies, such as office instructions (OIs) or standard operating procedures (SOPs)
4	A16	Plan or prepare briefings
5	B23	Conduct staff meetings or briefings

0018	Shop Supervisors	
1	A12	Establish performance standards for subordinates
2	A17	Plan or schedule work assignments
3	A21	Schedule personnel for temporary duty (TDY) assignments, leaves, or passes
4	A22	Write job descriptions
5	B24	Counsel personnel on personal or military-related matters
6	B35	Interpret policies, directives, or procedures for subordinates
7	B40	Supervise Communications-Computer Systems Program Journeymen (AFSC 3C052)
8	C43	Analyze workload requirements
9	C51	Evaluate personnel for compliance with performance standards
10	C52	Evaluate personnel for promotion, demotion, reclassification, or special awards
11	C60	Write EPRs
12	C61	Write recommendations for awards or decorations
13	D66	Conduct OJT

0018		Shop Supervisors (Continued)
14	D69	Counsel trainees on training progress
15	D70	Determine OJT requirements
16	D76	Direct or implement OJT programs
17	D79	Evaluate OJT trainees
18	D80	Evaluate progress of trainees
19	D81	Maintain training records, charts, or graphs
20	D82	Plan OJT

0019		NCOICs
1	B41	Supervise Communications-Computer Systems Program Craftsmen (AFSC 3C072)
2	C48	Evaluate job or position descriptions
3	C55	Evaluate work schedules
4	D64	Assign on-the-job training (OJT) trainers

0020		Instructors
1	D63	Administer or score tests
2	D67	Conduct resident course classroom training
3	D73	Develop lesson plans
4	D75	Develop training aids
5	D84	Score tests
6	D86	Write test questions

0021		Administrative Security
1	J372	Annotate or stamp sensitive unclassified or classified information, other than messages
2	J376	Designate classified materials for destruction
3	J377	Destroy classified or sensitive unclassified material
4	J379	Distribute classified materials
5	J380	Escort visitors through facilities
6	J387	Prepare classified materials for mail, delivery, or distribution
7	J393	Sign receipts for classified materials
8	J394	Store or safeguard classified materials

0022		Physical Security
1	J375	Desanitize site or equipment upon completion of classified processing
2	J381	Establish or update classified material files
3	J383	Give authorization or deny access to restricted or controlled areas or classified materials
4	J384	Inspect classified material
5	J386	Place downgrading instructions on classified material
6	J391	Review documents or other materials to determine security disposition
7	J392	Secure site or equipment for classified processing

0023		Classified Material Update
1	J382	Establish or update listings for classified jobs
2	J388	Prepare destruction reports for classified materials
3	J389	Prepare locator sheets on classified materials
4	J390	Prepare or revise classified material control logs

0024		Library
1	I359	Certify data storage media
2	I361	Destroy data storage media
3	I362	Establish or update data storage media accountability records
4	I363	File data storage media
5	I364	Inventory data storage media
6	I365	Issue data storage media
7	I368	Purge data storage media, other than by degaussing
8	I371	Visually inspect data storage media

0025		Configuration Management
1	H329	Assign configuration management control numbers
2	H330	Conduct configuration management audits
3	H335	Draft or write configuration management audit reports
4	H336	Draft or write configuration management plans
5	H339	Evaluate configuration management plans
6	H344	Maintain change control form logs or configuration status accounting logs
7	H346	Participate in configuration control boards (CCBs)

0026		Contracting
1	K397	Confirm contract terms, such as delivery date or quantity
2	K400	Determine requirements for modifications or amendments to contracts
3	K401	Establish procedures for equipment maintenance or other contractual support services
4	K402	Evaluate bids, quotations, or proposals for contract awards
5	K404	Monitor compliance with contracts
6	K406	Prepare procurement documents, such as purchase requests