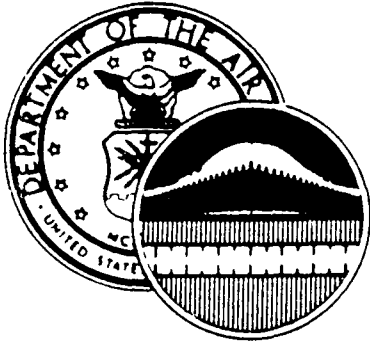
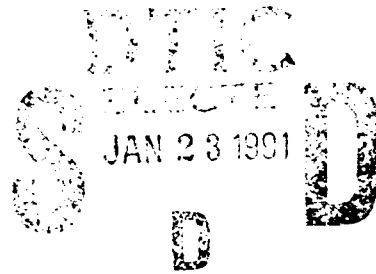


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UNITED STATES AIR FORCE

OCCUPATIONAL SURVEY REPORT



AD-A231 341

PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL)
CAREER LADDER

AFC. 324X0

AFPT 90-324-870

NOVEMBER 1990

OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT SQUADRON
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-5000

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	<u>OSR</u>	<u>ANL EXT</u>	<u>TNG EXT</u>	<u>JOB INV</u>
AFHRL/MODS	2	1m	1m	1
AFHRL/ID	1	1m	1m/1h	1
AFMPC/DPMRPQ1	2			
AFMPC/DPMRAD5	1			
ARMY OCCUPATIONAL SURVEY BRANCH	1			
CCAF/AYX	1			
DEFENSE TECHNICAL INFORMATION CENTER	2			
HQ AFSC/DPAL	3		3	
DET 2, USAFOMC (CHANUTE AFB IL)	1	1	1	1
DET 5, USAFOMC (LOWRY AFB CO)	1	1	1	1
HQ AFISC/DAP	2			
HQ AFLC/DPMAE	3		3	
HQ AFSC/TTA	1		1	
HQ ATC/DPAE	3		3	
HQ ATC/TTOA	2		1	
HQ MAC/DPAT	3		3	
HQ MAC/TTA	1		1	
HQ PACAF/DPAT	3		3	
HQ PACAF/TTA	1		1	
HQ SAC/DPAT	3		3	
HQ SAC/TTA	1		1	
HQ TAC/DPATJ	3		3	
HQ TAC/TTA	1		1	
HQ USAF/LEYM	1		1	
HQ USAF/DPPE	1			
HQ USAFE/DPAT	3		3	
HQ USAFE/TTA	1		1	
NODAC	1			
3400 TCHTW/TTGX (LOWRY AFB CO)	6	3	6	3
3400 TCHTW/TTS (LOWRY AFB CO)	1		1	
USAFOMC/OMDQ	1			
USAFOMC/OMYXL	10	2m	5	10
USMC (CODE TE-310)	1			
388 TFW/MAT	2		2	

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PREFACE

This report presents the results of an Air Force Occupational Survey of the **Precision Measurement Equipment Laboratory (PMEL)** career ladder (**AFSC 324X0**). Authority for conducting occupational surveys is contained in AFR 35-2. Computer products upon which this report is based are available for use by operations and training officials.

The survey instrument was developed by Mr Donald J. Cochran, Inventory Development Specialist. Mr Wayne J. Fruge provided computer support for this project. Administrative support was provided by Ms Raquel A. Soliz. Captain Terri L. Coccia analyzed the data and wrote the final report. This report has been reviewed and approved by Lieutenant Colonel Charles D. Gorman, Chief, Airman Analysis Section, Occupational Analysis Branch.

A PMEL Training Requirements Analysis (TRA) is being accomplished in conjunction with the PMEL OSR. The TRA will provide a comprehensive data base to support anticipated training decisions for the career ladder. It consists of three sections: 1) Specialty Background information - includes mission duties and responsibilities, training available, issues and concerns, and future plans; 2) TRA Procedures - procedures and methodology used in collecting and developing the TRA reports; and 3) Recommendations - general and specific recommendations including a proposed STS and a specific justification for each change. Copies of the TRA may be obtained from USAF Occupational Measurement Squadron, Detachment 2, Chanute AFB IL 61868-5000.

Copies of this report are distributed to Air Staff sections, Major Commands, and other interested training management personnel (see distribution on page i). Additional copies are available upon request to the USAF Occupational Measurement Squadron, Attention: Chief, Occupational Analysis Branch (OMY), Randolph AFB, Texas 78150-5000 (DSN 487-6623).

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SUMMARY OF RESULTS

1. **Survey Coverage**: Survey results are based on responses from 1,923 PMEL personnel who completed survey booklets. This represents 72 percent of all assigned 324X0 airmen. Incumbents were surveyed across all major using commands and include 3-, 5-, 7-, 9-, and CEM-skill level personnel.
2. **Career Ladder Structure**: Eight clusters and three independent job types are identified in the 324X0 specialty. The career ladder structure is organized around the different test measurement and diagnostic equipment (TMDE), including avionics-peculiar support equipment. The largest job, Frequency Generating and Measuring Equipment, encompasses Waveform Analysis Equipment, TACAN, Microwave Equipment, F-15 Unique Weapons System PME, as well as Quality Control. Other jobs include Voltage, Current and Impedance Equipment Maintenance, F-16 Unique Weapons System PME Maintenance, Electromechanical and Dimensional Equipment Maintenance Managers/Supervisors, Quality Assurance, PMEL Automated Management Subsystem (PAMS), PMEL Technical Training, Technical Order Library (TODO), and PMEL Scheduling.
3. **Career Ladder Progression**: Both 3- and 5-skill level personnel are performing jobs primarily technical in nature, with little responsibility for supervision and management. The jobs performed by 7-skill level airmen reflect a decline in the time spent performing technical tasks, while supervisory responsibilities increase substantially. The 9- and CEM-level personnel perform predominantly supervisory and managerial functions.
4. **AFR 39-1 Specialty Descriptions**: The descriptions in AFR 39-1 for the 324X0 PMEL career ladder provide a broad and accurate overview of the tasks and duties performed.
5. **Training Analysis**: The Specialty Training Standard (STS) and Plan of Instruction (POI) are not generally supported by OSR data when measured against standard ATC criteria listed in AFR 8-13 and ATCR 52-22. Consequently, an alternative approach in reviewing these documents is suggested. This approach, using percent members performing data across jobs, and/or labs, lends support to many additional areas. PMEL functional and training managers should closely examine these job- and/or lab-related data to ensure that both the STS and POI reflect accurate and comprehensive training requirements for the PMEL career ladder.
6. **Job Satisfaction**: Overall, PMEL respondents are generally satisfied with their jobs. Members in each career ladder job responded with similar high overall percentages of satisfaction members across four indicators, with "sense of accomplishment from work" being rated the lowest. Job satisfaction is similar or slightly higher between the PMEL career ladder and a comparative sample of Mission Equipment Maintenance personnel surveyed in 1989. In terms of changes in job satisfaction since the last OSR in 1984, mixed results were found. While job interest decreased for the 1-48 and 49-96 month TAFMS groups, all members show a higher view of perceived utilization of their training than was noted in the 1984 OSR.
7. **Implications**: The diversity of the AFSC 324X0 career ladder is such that the usual ATC measurement criteria for ABR training does not support the majority of the current entry-level course. Using job- and/or lab-related data, a full comprehensive review of training documents and programs is needed to ensure training requirements for the PMEL career ladder are accurately stated, and appropriate training is being provided in both the tech school and via on-the-job training. The AFR 39-1 job descriptions are adequate for all skill levels.

**OCCUPATIONAL SURVEY REPORT
PRECISION MEASUREMENT EQUIPMENT LABORATORY CAREER LADDER
(AFSC 324X0)**

INTRODUCTION

This is a report of an occupational survey of personnel in the **Precision Measurement Equipment Laboratory (PMEL)** career ladder completed by the Occupational Analysis Branch, USAF Occupational Measurement Squadron, in August 1990. The last occupational survey of this career ladder was published in February 1984. The present survey was requested by the Chief of the Aircraft and Munitions Maintenance Training Division HQ ATC/TTOA, Randolph AFB TX, and the Chief of the Metrology Training Division, 3450 TCTHG, Lowry AFB CO. The 324X0 career ladder has experienced major changes in equipment and maintenance concepts in recent years. The primary purpose for conducting this survey was to collect data to assist in evaluating these changes for use in updating the training documents and current training programs.

Background

According to AFR 39-1 Specialty Descriptions for AFSC 324X0, dated 31 Oct 88, Precision Measurement Equipment Laboratory personnel repair, calibrate, and certify test measurement and diagnostic equipment (TMDE), including laboratory standards and manual and automatic test equipment (ATE). They use TMDE to perform voltage, current, power, impedance, frequency, microwave, temperature, physical-dimensional, and radiac measurements. In addition, AFSC 32470 technicians aid specialists in preparing calibration responsibility determinations, analyze complex maintenance problems, and coordinate TMDE mission support requirements. The 32490 and Chief Enlisted Manager (CEM) PMEL members supervise the inspection, troubleshooting, overhaul, modification, repair, and calibration of TMDE, including automatic test stations, laboratory standards, and manual and ATE. They perform this supervisory role within a geographical area of responsibility.

Personnel entering the PMEL career ladder come from civilian life via technical training, or cross-train from electronic, avionics, or maintenance specialties. The technical school is located at Lowry AFB CO and is a Joint Service school with Army and Marine Corps students and instructors.

The 324X0 specialty requires an ASVAB electronic score of "67" and a strength aptitude score of "J" (60 lbs) to qualify for entry. Completion of general educational development equivalency or high school with courses in physics and electronics, trigonometry, and algebra is desirable.

The student flow for FY90 was 238, with a projected student flow for FY91 of 152. The elimination rate is planned as 8 percent, but in FY89 the wash out rate was approximately 5 percent from the resident course.

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The 33-week G3ABR32430-002 Precision Measurement Equipment Laboratory Specialist course is a basic course designed to teach the use of AF base calibration standards. It teaches students how to analyze and isolate malfunctions and how to repair and calibrate electrical/electronic precision measuring equipment. The course emphasizes the principles of electronics and metrology (the science of measurement). Completion of this course is mandatory for award of AFSC 32430.

AFSC 324X0 members work in Precision Measurement Equipment Laboratories (PMELs). Authorizations for PMEL equipment and facility requirements are tailored to support base mission demands. PMELs are the common link for base-level measurement and maintenance for all systems in the Air Force. PMELs are of several different types:

Type I. This laboratory maintains the Air Force's highest measurement standards certified by the National Bureau of Standards (NBS), U.S. Naval Observatory, or other nationally recognized standards. Located at Newark AFS OH, it consists primarily of civilians.

Type IIA. These base-level PMELs are operated by Air Force Logistics Command (AFLC) and theater support commands and provide support to air logistics centers (ALC) and/or designated geographic area. The three Type IIA PMELs with AFSC 324X0 airmen assigned are located at Bitburg AB GE, Elmendorf AFB AK, and Kadena AB JA.

Type IIB. This base-level PMEL, the most common, supports aircraft, missiles, ground systems, and other equipment on base or in a geographical area.

Type IIC. This PMEL provides support to research, development, tests, and evaluation programs that are normally conducted under the direction of the Air Force Systems Command (AFSC).

Type IID. This PMEL satisfies specific mission requirements and normally receives calibration support from the Type I PMEL. Similar to the Type I PMEL, it is located at Newark AFS OH and has no military personnel assigned.

Type III. Located at detached locations, these PMELs satisfy specific mission requirements. Normally receiving calibration support from Type II PMELs, they are not authorized at installations where a Type II PMEL exists. Type III PMELs are manned by civilian personnel.

Type IV. This PMEL supports the F-15 or F-16 weapon systems through the use of a transportable measurement system in both fixed and deployed locations. Although a Type IV PMEL receives calibration support from a Type II PMEL, they may be located at installations where Type II PMELs exist.

There are 145 active duty PMELs worldwide which support approximately 800,000 PME units or pieces of equipment. The type of PME supported depends upon the mission and systems of the base or region the PMEL supports. For this reason, PMEL jobs are many and diverse. PME support comes from a variety of operations and locations; some on the same base, others from a large region. PME varies widely in type, ranging from mechanical measuring equipment, X-ray equipment, and communications and other electronic equipment to avionics equipment. In technical jobs, most specialization is by type of equipment worked on, or "K" area. The letter "K" is derived from a letter used in the alpha-numeric designators for the TOs which prescribe most of the alignment, calibration, and troubleshooting procedures for PME. There are approximately 9,000 "K" procedures. Each procedure prescribes work for perhaps 100 of the 800,000 PME units in the Air Force.

SURVEY METHODOLOGY

Inventory Development

The data collection instrument for this occupational survey was USAF Job Inventory AFPT 90-324-870. A preliminary task list was prepared by the Inventory Developer after carefully reviewing previous task lists, current career ladder publications, training documents, and directives to determine the appropriateness of each task. This tentative task list was refined and validated through personal interviews with 139 subject-matter experts (SMEs) representing 14 operational bases and 1 training base. Field interview locations were determined based on the recommendation of MAJCOM Functional Managers and the Technical School Training Manager. This provided maximum coverage of the career ladder by visiting bases/units representing each type of Precision Measurement Equipment Laboratory (PMEL). Bases visited were:

ORGANIZATION	BASE	TYPE PMEL
21 CMS	Elmendorf AFB AK	IIA
55 AMS	Offutt AFB NE	IIB
28 AMS	Ellsworth AFB SD	IIB
OL-A 89 FMS	Bolling AFB DC	IIB
1 CRS	Langley AFB VA	IIB
60 AMS	Travis AFB CA	IIB
57 CRS	Nellis AFB NV	IIB
354 CRS	Mrytle Beach AFB SC	IIB
12 FMS	Randolph AFB TX	IIB
437 AMS	Charleston AFB SC	IIB
416 AMS	Griffiss AFB NY	IIC
6515 AMS	Edwards AFB CA	IIC
3246 AMS	Eglin AFB FL	IIC
21 CRS	Elmendorf AFB AK	IV F-15
1 CRS	Langley AFB VA	IV F-15
48 FIS	Langley VA	IV F-15
57 CRS	Nellis AFB NV	IV F-15
33 CRS	Eglin AFB FL	IV F-15
474 CRS	Nellis AFB NV	IV F-16
363 CRS	Shaw AFB SC	IIB/IV F-16
3450 TTG	Lowry AFB CO	Tech School

This process resulted in a final job inventory containing a list of 1,284 tasks grouped under 22 duty titles and a background section asking for such information as type of PMEL assigned, PMEL area where most time is spent, and type of equipment used or operated in present job. Three questions concerning fiber optics, torque wrenches, and lasers were added at the request of career field managers to identify future training needs.

Survey Administration

From **July through December 1989** Consolidated Base Personnel Offices (CBPO) at operational bases worldwide administered the inventory to all eligible DAFSC 324X0 personnel. Members eligible for the survey consisted of the total assigned population, excluding the following: (1) hospitalized personnel; (2) members in transition for a permanent change of station; (3) members retiring during the time inventories were administered to the ladder; and (4) members in the job less than 6 weeks. Participants were selected from a computer-generated mailing list obtained from personnel data tapes maintained by the AF Human Resources Laboratory (AFHRL).

Each individual who filled out an inventory booklet first completed an identification and biographical information section, and then checked each task performed in their current job. Next, members rated these tasks on a 9-point scale showing relative time spent on each task as compared to all other tasks checked. Ratings ranged from 1 (very small amount of time spent) to 9 (very large amount of time spent).

To determine relative percent time spent for each task checked by a respondent, all of the incumbent's ratings are assumed to account for 100 percent of his or her time spent on the job. The rating for each task is divided by the sum of all the ratings, then multiplied by 100 to provide a relative percentage of time for each task. This procedure provides the basis for comparing tasks in terms of both percent members performing and average relative percent time spent.

Survey Sample

Table 1 displays the MAJCOM distribution of survey respondents corresponding with the percent of assigned personnel as of August 1989. As shown in Table 1, a greater percentage of 324X0 members are assigned to TAC than to the other MAJCOMs. In addition, Table 2 displays survey respondents across paygrade groups. Approximately 33 percent of sampled 324X0 personnel are staff or technical sergeants (see Table 2). As illustrated in these tables, the survey sample is representative and comprehensive.

Task Factor Administration

Selected senior personnel completed a second booklet in addition to the job inventory booklet. This second booklet is used to gather information for either training emphasis (TE) or task difficulty (TD). The TE and TD booklets are processed separately from the job inventories and provide task rating information which is used in a number of different analyses discussed in more detail in the following section of this report.

Task Difficulty (TD). TD is defined as the length of time an average airman needs to learn a task. Given this definition, 76 senior technicians rated the difficulty of all the inventory tasks on a 9-point scale (from extremely low to extremely high). A statistical measurement of rating agreement, known as the interrater reliability, indicated acceptable agreement among raters as to the relative difficulty of the tasks. TD ratings were adjusted so tasks of average difficulty would have ratings of 5.00. The resulting data are essentially a rank ordering of tasks indicating the degree of difficulty for each task in the inventory.

TABLE 1
 COMMAND REPRESENTATION OF SURVEY SAMPLE
 AFSC 324X0

<u>COMMAND</u>	<u>PERCENT OF ASSIGNED*</u>	<u>PERCENT OF SAMPLE</u>
TAC	24	26
SAC	20	21
USAFE	15	16
ATC	12	6
MAC	12	14
PACAF	7	6
AFSC	5	5
AAC	3	3
OTHER	2	1

Total Assigned*: 2,704
 Total Eligible for Survey**: 2,234
 Total in Sample: 1,923
 Percent of Assigned in Sample: 71%
 Percent of Eligible in Sample: 86%

* Assigned strength as of August 1989
 ** Excludes those in PCS, retirement, discharge, or hospital status; and those with less than 6 weeks on the job

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

TABLE 2
 PAYGRADE DISTRIBUTION OF SURVEY SAMPLE
 AFSC 324X0

<u>PAYGRADE</u>	<u>PERCENT OF ASSIGNED*</u>	<u>PERCENT OF SAMPLE</u>
AIRMAN	24	20
E-4	35	38
E-5	21	22
E-6	10	10
E-7	7	7
E-8	2	3
E-9	1	1

* Assigned strength as of August 1989

Training Emphasis (TE) TE is a rating of which tasks require structured training for first-term personnel. Experienced technicians (primarily 7-skill level) completing TE booklets were asked to rate tasks on a 10-point scale (from no training emphasis to extremely high training emphasis). Ratings were independently collected from 174 NCOs. A statistical measurement of their agreement, known as the interrater reliability, was again found to be acceptable. The average TE rating for the career ladder is 1.38, with a standard deviation of 1.27. These data also provide essentially a rank ordering of tasks whereby those with the highest ratings are perceived as most important for structured training.

TE ratings provide objective information which should be used along with TD and percent members performing data when making training decisions. Percent members performing data provide information on how many personnel perform the tasks. TE and TD ratings provide insights on which tasks need training. Using these factors, in conjunction with appropriate training documents and directives, career ladder managers can tailor training programs to accurately reflect the needs of the user by more effectively determining when, where, and how to train first-enlistment AFSC 324X0 personnel.

Data Processing and Analysis

Once job inventories are returned from the survey incumbents, task responses and background information are optically scanned and entered into a UNISYS 11000 mainframe computer. Computer-generated programs, using Comprehensive Occupational Data Analysis Program (CODAP) techniques, are then applied to the data.

CODAP produces composite job descriptions for respondents based on their ratings of specific inventory tasks. These job descriptions provide information on percent members performing each task, the relative average percent time spent performing tasks, and the cumulative percent time spent by all members performing tasks in the inventory. In addition to the job descriptions based upon inventory task data, the program produces summaries that show how members of each group responded to each background item. Background items aid in identifying characteristics of the group, such as DAFSCs represented, time in career ladder, total active federal military service (TAFMS), experience in various functional areas, equipment operated, and job satisfaction levels.

SPECIALTY JOBS (Career Ladder Structure)

A key aspect of the USAF Occupational Analysis Program is to examine the job structure of a career ladder. Based on incumbent responses to survey questions, the tasks performed by career ladder personnel are examined and jobs are identified based on the similarity of tasks and the relative time they spend performing the tasks. The resulting job structure is then compared to official career ladder documents. This information can be used to examine the accuracy and completeness of career ladder documents (AFR 39-1 Specialty Descriptions and Specialty Training Standards) and to gain an understanding of current utilization patterns.

For this report, the career ladder structure is described in terms of clusters and independent job types. The job type is the basic unit of job analysis. It represents a specific group of individuals performing basically the same tasks and spending similar amounts of time on those tasks. When job type members perform tasks in common with other groups, they merge to form a larger unit of related jobs termed a cluster. Specialized job types too dissimilar to fit within a cluster are labeled independent job types (IJT).

Structure Overview

The specialty job structure of the Precision Measuring Equipment Laboratory (PMEL) career ladder was determined by performing a job type analysis of the survey data provided by the 1,923 survey respondents. The jobs performed by these airmen separated into eight clusters and three independent job types, as shown in Figure 1.

The eight clusters and three independent job types are listed below. The stage (STG) number beside each title is a computer-generated reference number. The letter "N" stands for the number of personnel in each group.

- I. **FREQUENCY GENERATING AND MEASURING EQUIPMENT CLUSTER (K3)
(STG54, N=799)**
- II. **VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT CLUSTER (K1/K2)
(STG55, N=406)**
- III. **F-16 UNIQUE WEAPONS SYSTEM PRECISION MEASURING EQUIPMENT (PME)
CLUSTER (STG67, N=45)**
- IV. **ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT CLUSTER (K5/K6)
(STG33, N=203)**
- V. **PMEL MANAGERS AND LABORATORY CHIEFS CLUSTER (STG38, N=257)**
- VI. **PMEL QUALITY ASSURANCE CLUSTER (STG76, N=38)**
- VII. **PMEL AUTOMATED MANAGEMENT SUBSYSTEM (PAMS) CLUSTER (STG156, N=20)**
- VIII. **PMEL TECHNICAL TRAINING CLUSTER (STG42, N=38)**
- IX. **TECHNICAL ORDER DISTRIBUTION OFFICE (TODO) IJT (STG242, N=6)**
- X. **PMEL SCHEDULING IJT (STG349, N=8)**
- XI. **RADIAC EQUIPMENT MAINTENANCE IJT (STG555, N=7)**

Ninety-five percent of the survey respondents are represented in the above job groups. The remaining 5 percent performed jobs that did not group with any of the defined jobs. Brief descriptions of each cluster and independent job type are presented below. In addition, Table 3 provides selected background information across these jobs, while Appendix A lists common tasks performed by incumbents in these groups.

AFSC 324X0 CAREER LADDER JOBS

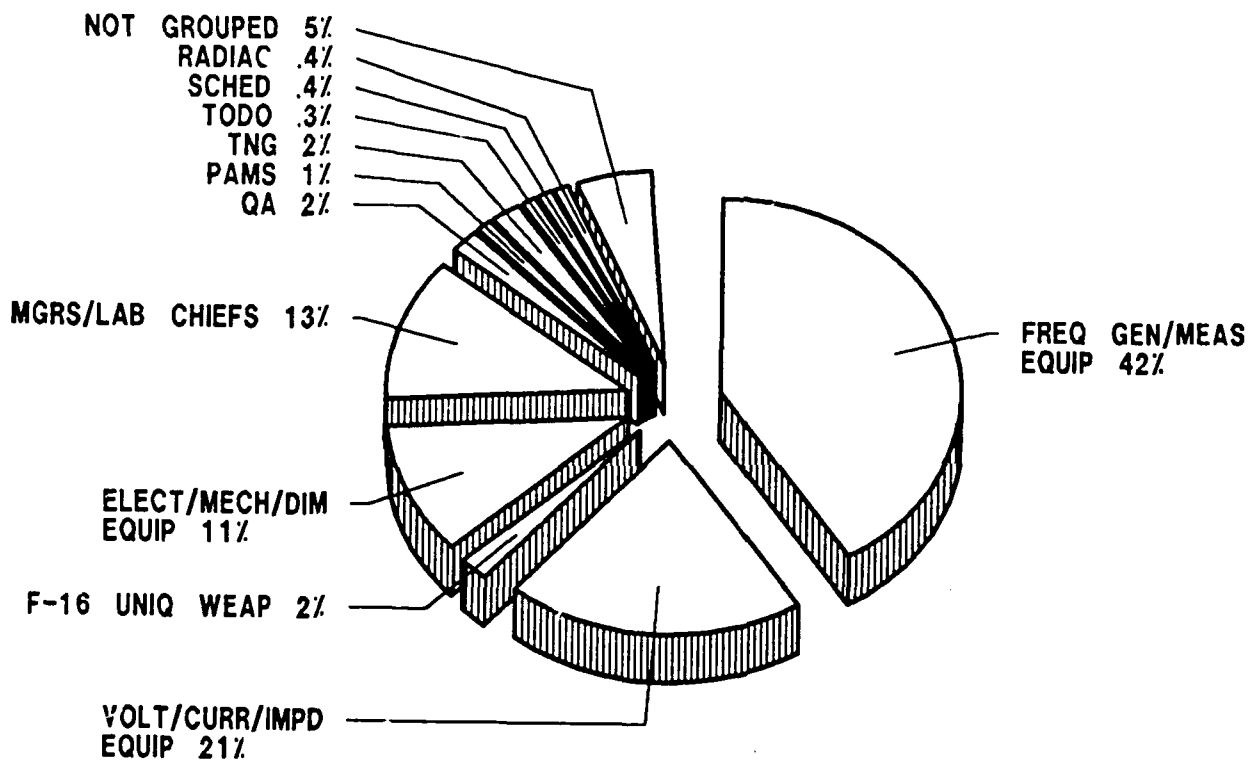


Figure 1

TABLE 3

SELECTED BACKGROUND DATA FOR CAREER LADDER JOBS

	FREQ GENERATING AND MEA EQUIP CLUSTER (SIG54)	VOLTAGE, CURR, & IMPEDENCE EQUIP CLUSTER (SIG55)	F-16 UNIQUE WPNS SYS PME CLUSTER (SIG67)	ELECTROMECHANICAL AND DIMENSIONAL EQUIP CLUSTER (SIG33)	PMEL MGR & LAB CHIEF CLUSTER (SIG38)
NUMBER IN GROUP	799	406	45	203	257
PERCENT OF SAMPLE	42%	21%	2%	11%	13%
PERCENT IN CONUS	70%	73%	56%	69%	68%
DAFSC DISTRIBUTION (PERCENT):					
32430	12%	28%	4%	9%	1%
32450	73%	62%	87%	74%	7%
32470	15%	10%	9%	17%	73%
32490	0%	0%	0%	0%	12%
32400	0%	0%	0%	0%	7%
AVERAGE PAYGRADE					
AVERAGE TICF (MOS)	E-4	E-5	E-4	E-4	E-7
AVERAGE TAFMS (MOS)	57	42	49	64	147
PERCENT IN 1ST ENL	69	57	58	76	196
	49%	61%	49%	45%	1%
AVERAGE NUMBER OF TASKS					
PERFORMED	152	115	104	137	131
AVERAGE NUMBER SUPERVISED	1	1	0	1	9
PERCENT SUPERVISING	35%	27%	22%	39%	93%

TABLE 3 (CONTINUED)

SELECTED BACKGROUND DATA FOR CAREER LADDER JOBS

	PMEL QLTY ASSURANCE CLUSTER (SIG76)	PMEL AUTOMATED MGT SUBSYS (PAMS) CLUSTER (SIG156)	PMEL TECH TRAINING CLUSTER (SIG42)	TECH ORDER DISTRIBUTION OFFICE IJT (SIG242)	PMEL SCHEDULING IJT (SIG349)	RADIAC EQUIP MAINT IJT (SIG555)
NUMBER IN GROUP	38	20	38	6	8	7
PERCENT OF SAMPLE	2%	1%	2%	*	*	*
PERCENT IN CONUS	66%	70%	100%	50%	88%	57%

DAFSC DISTRIBUTION (PERCENT):

32430	0%	0%	0%	0%	7%	0%
32450	50%	50%	47%	67%	67%	86%
32470	47%	50%	53%	33%	27%	14%
32490	3%	0%	0%	0%	0%	0%
32400	0%	0%	0%	0%	0%	0%

AVERAGE PAYGRADE

	E-5	E-5	E-5	E-5	E-5	E-4
AVERAGE TICF (MOS)	95	113	111	74	54	72
AVERAGE TAFMS (MOS)	116	135	125	102	64	81
PERCENT IN 1ST ENL	11%	10%	0%	17%	13%	28%

AVERAGE NUMBER OF TASKS PERFORMED
AVERAGE NUMBER SUPERVISED
PERCENT SUPERVISING

AVERAGE NUMBER OF TASKS PERFORMED	60	73	34	15	31	47
AVERAGE NUMBER SUPERVISED	1	3	2	0%	1	2
PERCENT SUPERVISING	55%	45%	18%	17	37%	71%

Descriptions of Career Ladder Jobs

I. FREQUENCY GENERATING AND MEASURING EQUIPMENT CLUSTER (STG54, N=799)

These 799 airmen form the largest group, representing 42 percent of the total survey sample. They primarily perform maintenance on frequency generating and measuring equipment, and waveform analyzing equipment. On the average, members report performing 147 tasks. Common tasks include:

- calibrate time mark generators
- calibrate RF signal generators
- calibrate distortion analyzers
- solder or desolder ESDS
- calibrate horizontal time base plug-in units
- calibrate analog oscilloscopes
- calibrate function generators

Within this cluster, five job variations were noted. Four (Waveform Analysis Equipment, TACAN, Microwave Equipment, and F-15 Unique Weapon System PME) differed primarily due to the amount of time spent focusing on their respective special equipment. The fifth variation is Quality Control, and these personnel differed in that they spent a great portion of their respective job time inspecting outgoing TMDE for documentation accuracy and cleanliness and also performing quality verification inspections.

Comprised mostly of 5-skill level personnel, these incumbents average 5 3/4 years of total active federal military service (TAFMS) and predominantly hold the rank of E-4. They are assigned to various types of PMELs including **Type IIB (62 percent)**, **Type IIA (10 percent)**, **Type IV (10 percent)** and **Type II/IV (9 percent)**.

II. VOLTAGE, CURRENT, AND IMPEDENCE EQUIPMENT CLUSTER (STG55, N=406)

The 406 members of this job represent 21 percent of the total survey sample. The overall mission of these members involves maintaining voltage, current, and impedance equipment, such as ammeters and voltmeters, and this accounts for 30 percent of their relative job time. Maintaining electrical measurements consoles and associated equipment occupied 17 percent of their time, while 12 percent of their time is spent performing general administrative and supply tasks. Of the average 114 tasks performed by these incumbents, typical tasks include:

- calibrate AC/DC analog multimeters or accessories
- align, troubleshoot, or repair electronic voltmeters
- align, troubleshoot, or repair vacuum tube voltmeters
- align, troubleshoot, or repair digital voltmeters
- align, troubleshoot, or repair analog ammeters
- calibrate electronic voltmeters
- calibrate RF millivoltmeters

Within this cluster, there were seven variations. These included Oscilloscope Maintenance, Counter Calibration, Torque Wrench Maintenance, Electrical Measuring Console Maintenance, OJT, Line Supervision, and Electromechanical and Dimensional Equipment Maintenance.

Comprised mostly of 5-skill level personnel, 65 percent of the group is located at **Type IIB labs** and, overall, they have an average TAFMS of nearly 5 years and are predominantly in paygrade E-4.

III. F-16 UNIQUE WEAPONS SYSTEM PRECISION MEASURING EQUIPMENT (PME) CLUSTER (STG67, N=45). This group of 45 airmen comprises 2 percent of the total survey sample. They primarily perform maintenance on F-16 unique weapons system precision measuring equipment. They also perform general administrative and supply tasks, and general PMEL tasks. Several pieces of equipment are unique to this job, including standard and gauge capacitors, ramp generators, humidigraphs, hygrothermographs, ice point reference junctions, pressure regulators, torque calibration standards, altitude & airspeed test sets, dead weight sets, and torque wrenches. Of the average 104 tasks performed by these incumbents, representative tasks include:

- align, troubleshoot, or repair preload armament circuit test sets (16U75060-)
- align, troubleshoot, or repair SMS breakout boxes (16UE75517-)
- align, troubleshoot, or repair stores management system (SMS) (16U75501-)
- calibrate SMSs (16U75501-)
- calibrate SMS breakout boxes (16UE75517)
- align, troubleshoot, or repair chaff/flares dispenser test sets (AN/ALM-177-)
- calibrate EPUs (912476-)

Comprised mostly of 5-skill level personnel, 44 percent of the group is located overseas. Overall, they have an average TAFMS of slightly over 4 1/2 years and are predominantly in paygrade E-4. Eighty-two percent of these personnel are assigned to **Type IV labs**.

IV. ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT CLUSTER (STG33, N=203). This group of 203 airmen represents 10 percent of the total respondent sample. Members in this group perform maintenance tasks associated with electrical and mechanical dimensional equipment. Forty-seven percent of their job time is spent maintaining this equipment, while 13 percent of their time is spent performing general administrative and supply tasks. These airmen perform an average of 137 tasks. Common tasks include:

- calibrate combustibles or toxic gas analyzers or alarms
- calibrate oxygen or lox gauges
- calibrate bourdon tube type gauges
- convert temperature among Fahrenheit, Celsius, Kelvin, or Rankine scales
- align, troubleshoot, or repair bourdon tube type gauges

There were five variations noted in this cluster including Metrology; Administration; Voltage, Current, and Impedance Equipment; Supervision; and Optical Equipment. Once again, differences in these variations were identified due to the amount of time spent focusing on the various above mentioned types of PMEL equipment.

This job group is comprised mostly of 5-skill level personnel. Some special equipment used by this group includes analytical balance scales, autocollimators, barometers, calibration trailers, collimators, dynamometers, and planakators. Approximately 31 percent of this group is located overseas, and 71 percent work in **Type IIB laboratories**. Overall, they have an average TAFMS of slightly over 6 years and are predominantly in paygrade E-4.

V. PMEL MANAGERS AND LABORATORY CHIEFS CLUSTER (STG038, N=257). The 257 members in this group represent the most senior level of personnel in the survey sample. Twenty-nine percent are in paygrade E-6, 42 percent in paygrade E-7, while 11 percent are in E-8. As would be expected with such a group, all group members are senior in grade, time in career field (93 percent have greater than 8 years), and hold 7- (73 percent), 9- (12 percent), and CEM (7 percent) skill-level DAFSCs. With an average of nearly 16 years TAFMS, these incumbents devote approximately 74 percent of their time performing supervisory, managerial, or administrative functions. They supervise an average of 9 people, and 56 percent of them are assigned to **Type IIB labs**.

Approximately 28 percent of the managers work in TAC, and 19 percent are members of SAC, with 68 percent located on bases in the Continental United States (CONUS). Representative tasks of the average 131 tasks performed by this group include:

- write EPRs
- counsel personnel on personal or military-related matters
- participate in meetings, such as staff meetings, conferences, or workshops, other than training
- write recommendations for awards, decorations, or recognitions
- escort visitors through facilities
- evaluate personnel for recognition

Variations in this job identified five distinct classifications within the supervisory functions which include: Functional Area Managers, PMEL Automated Subsystem (PAMS), Quality Assurance, Training, and Inspectors/Evaluators. The variations account for the specific areas in which the managers/lab chiefs are spending most of their respective job time.

VI. PMEL QUALITY ASSURANCE CLUSTER (STG76, N=38). The 38 members in this group represent an average TAFMS of 116 months and are mostly in paygrade E-7. Seventy-one percent are qualified to a 7-skill level, and 47 percent have over 9 years TAFMS. These incumbents devote approximately 43 percent of their time performing quality assurance tasks, and 71 percent are assigned to **Type IIB labs**. Representative tasks of the average 59 tasks performed by this group include:

- perform TMDE Quality Verification Inspections (QVI)
- perform over-the-shoulder or task evaluations of PMEL personnel
- monitor PMEL technicians QA sampling level by multilevel continuous sampling method
- inspect outgoing TMDE for documentation accuracy, cleanliness, physical condition, and safety

VII. PMEL AUTOMATED MANAGEMENT SUBSYSTEM (PAMS) CLUSTER (STG156, N=20). This group of 20 respondents, equating to 1 percent of the total survey sample, is responsible for performing PMEL Automated Subsystem (PAMS) tasks. Fourteen percent of their relative job time is spent performing general administrative and supply tasks. Members perform an average of 73 tasks. Sixty percent of these members are assigned to **Type IIB labs**, while 15 percent are in both **Types IIC and II/IV labs**. Common tasks include:

- assign PMEL Automated Management Subsystem (PAMS) passwords
- assign spooler tasks to specific PAMS terminals
- edit PAMS user files
- establish PAMS user files
- perform PAMS daily, weekly, or monthly backups

Half of the members hold a 5-skill level DAFSC and half hold a 7-skill level in the career ladder. Average time in the career field is about 9 years, with just over 11 years of TAFMS. These members are predominantly in paygrade E-5.

VIII. PMEL TECHNICAL TRAINING CLUSTER (STG42, N=38). These 38 members are responsible for the training of the PMEL career ladder. They spend 48 percent of their job time training, and the remainder of time is spent performing metrology computations and analysis and general administrative and supply tasks. Eighty-seven percent of these members hold at least an E-5 paygrade, and 60 percent have over 8 years of TAFMS. These members perform an average of 34 tasks. Representative tasks performed which make these career ladder personnel unique include:

- administer tests
- write test questions
- evaluate progress of trainees
- score tests
- write lesson plans

IX. TECHNICAL ORDER DISTRIBUTION OFFICE (TODO) IJT (STG242, N=6). This independent job type includes six individuals who perform general administrative and supply tasks for 47 percent of their relative job time. Fifty percent of these members are located overseas, and the members are equally distributed in **Type IIA, IIB, and Type II/IV PMEL labs**. Incumbents perform an average of only 15 tasks. Representative tasks include:

- determine publication or technical order requirements
- initiate or complete technical order library forms, such as AFTO Forms 32, 110, 110A, 110B, 131, and 187
- initiate or complete Technical Order System Forms, such as AFTO Forms 22 and 27
- maintain Technical Order libraries

Members in this group hold a 5-skill level, are in paygrade E-5, and average over 8 years of TAFMS.

X. PMEL SCHEDULING IJT (STG349, N=8). The eight individuals in this independent job type consider their job title to be "PMEL Scheduler." Their main function is performing scheduler tasks, which account for 63 percent of their relative job time and include performing incoming inspections of TMDE, planning and scheduling on-site calibrations, and issuing hand receipts for incoming TMDE. Eighty percent of these members are assigned to CONUS bases, and 60 percent are in SAC. Sixty-seven percent work in **Type IIB labs**. On the average, these members perform 27 tasks. Representative tasks include:

- perform incoming inspections of TMDE
- plan or schedule on-site calibrations
- issue hand receipts to OWC for incoming TMDE
- assign TMDE job control numbers
- maintain TMDE calibration (forecast) listings and schedules
- review and update PMEL listings

Members in this group predominantly hold a 5-skill level, and are in paygrade E-5, with slightly over 10 years of TAFMS and 7 1/2 years in the career field.

XI. RADIAC EQUIPMENT MAINTENANCE IJT (STG555, N=7). Incumbents in this job have an average TAFMS of over 6 years and are in paygrade E-4. They hold a 5- or 7-skill level. Forty-three percent of the personnel in the Radiac IJT are located on bases overseas. These airmen perform an average of 47 tasks. Typical tasks include:

- calibrate ion chamber detectors
- calibrate scintillation detectors
- perform leak tests on radioisotopes (swipe test)
- calibrate personnel dosimeters

The radiac specialists use unique equipment including radiac detectors, radiation detecting equipment, digital multimeters and oscilloscopes, alpha/beta and gamma sources, and differential and digital voltmeters. Fifty-seven percent of these technicians work in **Type IIC laboratories**, which is the PMEL that provides support to the Air Force Systems Command.

Comparison of Specialty Jobs

Analysis of the AFSC 324X0 career ladder structure indicates that the PMEL specialty may be considered diverse. This diversity exists due to the great variety of missions and systems the PMELs are required to support. The PME varies widely in type including mechanical measuring equipment, X-ray equipment, communication equipment and other electronics equipment, and avionics. In technical jobs, the specialization is by type of equipment worked on. Three PMEL clusters, which were distinguished according to PMEL measurements or "K" areas, account for a total of 1,408 members or 73 percent of the survey sample. Each of the "K" areas: K1/K2-Voltage Current, and Impedance Equipment, K3-Frequency Generating/Waveform Analyzing Equipment, and K5/6 Electromechanical and Dimensional Equipment, consisted of similar primary functions (align, troubleshoot, repair) for very different types of equipment. Nontechnical support function jobs include Supervisory, Training, Schedulers, TODO, PAMS, and QA and represent 19 percent of the survey sample. These support jobs enhance the quality and efficiency of PMEL maintenance.

In summary, specialty jobs show a concentration by broad measurement area, with a slight majority of job time being spent within that specific area. The remainder of job time is distributed over several technical areas, with the mix of duties and time varying considerably among 324X0 personnel.

Job Structure Comparison to Previous Survey

The results of the specialty job analysis were compared to the previous Precision Measurement Equipment career ladder's occupational survey report, which was completed in February 1984 (Report Number: AFPT 90-324-497). Sample size for the 1989 survey was larger--1,923 compared to 1,513 for the 1984 survey.

Table 4 lists the major jobs identified in the 1989 survey and their equivalent jobs from the 1984 OSR. A review of the jobs performed by the current sample indicates that most of the 1989 job groups can be matched to similar jobs performed by the PMEL personnel in the job groups identified in the 1984 report. Overall, 7 of the 11 current jobs have an equivalent counterpart in the previous study. Three of the jobs not identified in the previous study (Technical Order Distribution Office (TCDO), Scheduling, and PMEL Automated System (PAMS)), have recently been added to the PMEL career ladder due to changes and advances in the field. Recently, AFR 39-1, 15 Sep 88, effective 31 Oct 88, deleted all references to PMEL from the duties and responsibilities section of the 392X0 (Scheduler) career field. Thus, all scheduler tasks are now being performed by 324X0 personnel. PAMS is a new system which will eliminate the "manual" processing of many TMDE maintenance actions and is supposed to replace the "Scheduler" (392X0) in the PMEL.

The fourth job that was not found to be an independent job type in the 1984 survey was the Radiac Equipment Maintenance area. It was, however, identified as a variation within two separate clusters: Frequency Generating and Measuring Equipment cluster and Waveform Analysis Equipment Maintenance Personnel cluster, and also the Electromechanical and Dimensional Equipment Personnel cluster.

Generally, the 324X0 career ladder has remained relatively unchanged in terms of basic technical job types and personnel makeup. The exceptions are the recent addition of Type IV PMELs which support F-15 and F-16 weapons systems and the additional support jobs including PAMS and Scheduling.

TABLE 4
COMPARISON OF MAJOR JOBS BETWEEN SURVEYS

<u>CURRENT SURVEY (N=1,923)</u>	<u>1984 SURVEY (N=1,513)</u>
FREQUENCY GENERATING/MEASURING EQUIP CLUSTER	FREQUENCY GEN & MEAS EQUIP PERS FREQUENCY GEN/WAVEFORM EQUIP PERS
VOLTAGE, CURRENT & IMPEDANCE EQUIP CLUSTER	VOLTAGE, CURRENT, IMPED ELEC MEAS PERS
F-16 UNIQUE WEAPONS SYS PMEL CLUSTER	F-16 PME PERS
ELECTRO MECH/DIMENSIONAL EQUIP CLUSTER	ELECTROMECH & DIMENSIONAL PERS
PMEL MGRS/LAB CHIEFS CLUSTER	MANAGERS & LAB CHIEFS
PMEL QUALITY ASSURANCE CLUSTER	QUALITY ASSURANCE PERS
PMEL AUTOMATED MGT SUBSYS (PAMS) CLUSTER	NOT IDENTIFIED
PMEL TECH TRAINING CLUSTER	TECH TNG INSTRUCTORS
TECHNICAL ORDER DISTRIBUTION OFFICE (TODO) IJT	NOT IDENTIFIED
PMEL SCHEDULING IJT	NOT IDENTIFIED
RADIAC EQUIPMENT MAINTENANCE IJT	NOT IDENTIFIED

ANALYSIS OF DAFSC GROUPS

In addition to the analysis of the career ladder structure, an examination of the jobs and tasks performed at each skill level is helpful in understanding the PMEL specialty. The DAFSC analysis compares the skill levels to identify differences in task performance. This information may then be used to determine whether personnel are utilized in the manner specified by the Specialty Description (AFR 39-1) and may serve as a basis for considering changes to current utilization policies and training programs.

Comparison of the duty and task performance between DAFSCs 32430 and 32450 indicates that, even though there are some minor differences, the jobs they perform are essentially the same. Therefore, they will be discussed as a combined group in this report for comparison with the 7-skill level group. Also, the 9- and CEM-skill levels show little difference between them and will be discussed as a group.

Table 5 of this report displays the distribution of DAFSC group members across career ladder jobs. As this table indicates, the 1,409 members of the 3-/5-skill level group cover the spectrum of career ladder jobs, with 74 percent of the group found in either the Frequency Generating & Measuring Equipment Maintenance cluster or the Voltage, Current, & Impedance Equipment Maintenance cluster. Only 2 percent of this group are part of the supervisory cluster. A portion of the 7-skill level members are also found in the Frequency Generating Equipment cluster (26 percent) and the voltage, current, & impedance cluster (9 percent). A few members from each skill level group are technical training instructors. Table 6 shows the average percent time spent on duties across both skill-level groups. The 3-/5-skill level members spend a larger portion of their time performing maintenance tasks on voltage, current & impedance equipment, frequency generating & measuring equipment, and waveform analyzing equipment compared to the 7-skill level group (see Table 6). In contrast, the 7-skill DAFSC members concentrate more on supervisory duties (A thru D). Overall, Tables 5 and 6 reflect apparent differences between the two skill-level groups in terms of the jobs and tasks performed. Further discussion of this data is contained below.

Skill Level Descriptions

DAFSC 32430/50. These personnel perform an average of 119 tasks. Of the 1,409 (73 percent of the survey sample), 679 are members of the Frequency Generating and Measuring Equipment Maintenance cluster. This accounts for 48 percent of these PMEL members. There are 365 of these members in the Voltage, Current, and Impedance Equipment cluster. Table 6 displays the duties where the 32430/50 members spend most of their time. These duties are technical in nature, with the exception of performing general administration and supply tasks. Most of these members spend time on tasks such as inspecting, replacing, and servicing batteries and common nonelectrical hardware, and soldering, desoldering circuit components, and other TMDE. A list of representative tasks can be found in Table 7.

DAFSC 32470. The 463 7-skill level personnel (24 percent of the 324X0 survey sample) perform an average of 151 tasks. These airmen supervise an average of seven people and spend 55 percent of their time on supervisory and managerial tasks (duties A through E). While many of the 7-skill level personnel are members of the PMEL Managers and Lab Chiefs cluster, nearly 44 percent of these highly skilled airmen are also present in the more technically oriented jobs (see Table 5). Examples of tasks performed by this group include: write EPRs, counsel personnel on personal or military-related matters, determine work priorities, and annotate training records. A more complete listing of characteristic tasks for these incumbents can be found in Table 8.

TABLE 5

DISTRIBUTION OF 324X0 DAFSC GROUP MEMBERS ACROSS CAREER LADDER JOBS
(NUMBER AND PERCENT RESPONDING)

CAREER LADDER JOBS	DAFSC 32430/50 (N=1,409)		DAFSC 32470 (N=463)		DAFSC 32490/00 (N=51)	
	NBR	PCT	NBR	PCT	NBR	PCT
I. FREQUENCY GENERATING & MEASURING EQUIP CLUSTER (STG54, N=799)	679	48%	120	26%	0	0%
II. VOLTAGE, CURRENT, & IMPEDANCE EQUIP CLUSTER (STG55, N=406)	365	26%	41	9%	0	0%
III. F-16 UNIQUE WEAPONS SYS PME CLUSTER (STG67, N=45)	41	3%	4	1%	0	0%
IV. ELECTROMECH & DIMENSIONAL EQUIP CLUSTER (STG33, N=203)	167	12%	35	8%	0	0%
V. PMEL MANAGERS & LAB CHIEFS CLUSTER (STG38, N=257)	21	2%	188	40%	49	96%
VI. QUALITY ASSURANCE CLUSTER (STG76, N=38)	19	1%	18	4%	1	2%
VII. PMEL AUTOMATED MGT SUBSYSTEM (PAMS) CLUSTER (STG156, N=20)	10	*	10	2%	0	0%
VIII. PMEL TECH TRNG CLUSTER (STG42, N=38)	18	1%	20	4%	0	0%
IX. TECH ORDER LIBRARY (TODO) IJT (STG242, N=6)	4	*	2	*	0	0%
X. PMEL SCHEDULING IJT (STG349, N=8)	8	*	*	*	0	0%
XI. RADIAC EQUIPMENT MAINTENANCE IJT (STG555, N=7)	6	*	1	*	0	0%
NOT GROUPED (N=109)	71	5%	24	5%	1	*
TOTAL	1,409	100%	463	100%	51	98%

* Less than 1 percent

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

TABLE 6
 AVERAGE PERCENT TIME SPENT PERFORMING DUTIES BY
 324X0 DAFSC GROUPS

DUTIES	DAFSC 32430/50 (N=1,409)	DAFSC 32470 (N=463)	DAFSC 32490/00 (N=51)
A ORGANIZING AND PLANNING	1	11	26
B DIRECTING AND IMPLEMENTING	2	10	19
C INSPECTING AND EVALUATING	1	11	26
D TRAINING	2	8	6
E PERFORMING GENERAL ADMINISTRATION AND SUPPLY TASKS	13	15	13
F PERFORMING QUALITY ASSURANCE TASKS	2	5	3
G PERFORMING SCHEDULER TASKS	1	3	1
H PERFORMING PMEL AUTOMATED MANAGEMENT SUBSYSTEM (PAMS)	1	3	3
I PERFORMING METROLOGY, COMPUTATIONS, AND ANALYSIS	13	6	1
J PERFORMING GENERAL PMEL MAINTENANCE TASKS	6	4	*
K MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIP (K1/2)	12	3	*
L MAINTAINING FREQUENCY GENERATING AND MEASURING EQUIP (K3)	11	5	*
M MAINTAINING WAVEFORM ANALYZING EQUIPMENT (K3)	10	4	*
N MAINTAINING MICROWAVE EQUIPMENT (K4)	4	3	*
O MAINTAINING ELECTROMECHANICAL AND DIMENSIONAL EQUIP (K5&K6)	8	5	*
P MAINTAINING OPTICAL EQUIPMENT (K6)	1	1	*
Q MAINTAINING RADIAC EQUIPMENT (K7)	1	1	*
R MAINTAINING ELECTRICAL MEASUREMENTS CONSOLES & EQUIP (K8)	6	3	*
S MAINTAINING AUTOMATIC TEST EQUIPMENT	*	*	*
T MAINTAINING SPECIAL TEST EQUIPMENT	4	2	*
U MAINTAINING F-15 UNIQUE WEAPONS SYSTEM PME	1	1	*
V MAINTAINING F-16 UNIQUE WEAPONS SYSTEM PME	1	*	*

* Less than 1 percent

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

TABLE 7
 REPRESENTATIVE TASKS PERFORMED BY
 DAFSC 32430 AND 32450 PERSONNEL
 (N=1,409)

TASKS	PERCENT MEMBERS PERFORMING
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	85
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	85
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	84
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	84
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	82
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	79
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS	75
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	73
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	73
I415 INTERPRET CALIBRATION CORRECTION CHARTS OR GRAPHS	70
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	69
I427 SOLDER OR DESOLDER ESDs	68
I406 CLEAN, TREAT, OR REPLACE FILTERS	66
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	60
I422 RECONSTRUCT RUNS OR SOLDERING PADS	59
J438 CALCULATE CURRENT, VOLTAGE, IMPEDANCE, OR POWER PARAMETERS	57
I428 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING PACE SYSTEM	54

TABLE 8
 REPRESENTATIVE TASKS PERFORMED BY
 DAFSC 32470 PERSONNEL
 (N=463)

TASKS	PERCENT MEMBERS PERFORMING
C130 WRITE EPRs	75
B87 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY SPECIALISTS (AFSC 32450)	72
D134 ANNOTATE TRAINING RECORDS	71
B55 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED MATTERS	69
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	68
A1 ASSIGN MAINTENANCE AND REPAIR WORK	66
A9 DETERMINE WORK PRIORITIES	65
C117 INSPECT PERSONNEL FOR COMPLIANCE WITH MILITARY STANDARDS	63
E214 ESCORT VISITORS THROUGH FACILITIES	63
C131 WRITE RECOMMENDATIONS FOR AWARDS, DECORATIONS, OR RECOGNITIONS	62
C103 EVALUATE PERSONNEL FOR RECOGNITION	62
B77 INITIATE ACTION TO CORRECT SUBSTANDARD PERFORMANCE OF PERSONNEL	62
A30 PARTICIPATE IN MEETINGS, SUCH AS STAFF MEETINGS, CONFERENCES, OR WORKSHOPS, OTHER THAN TRAINING	60
D137 CONDUCT OJT	59
D160 MAINTAIN TRAINING RECORDS, CHARTS, OR GRAPHS	57
E210 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	57
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	57
D140 COUNSEL TRAINEES ON TRAINING PROGRESS	56
A40 PLAN OR SCHEDULE WORK PRIORITIES	56
E185 ANNOTATE OR ATTACH EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1297 (TEMPORARY ISSUE RECEIPT)	54
A27 ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	53
D155 EVALUATE PROGRESS OF TRAINEES	52
B88 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY TECHNICIANS (AFSC 32470)	49

DAFSC 32490/00. Technical duties no longer occupy these 51 senior managers' time. In fact, as Table 6 shows, most time at these skill levels is involved in management and administration. The disappearance of technical duties begins at the 7-skill level and is complete with these personnel. Senior career ladder personnel jobs fell within the Managers and Laboratory Chiefs cluster and the Quality Assurance group. They appeared in no other specialty job group identified. For a representative task list, see Table 9.

Tasks which best distinguish the 7-skill level personnel from their junior counterparts are presented in Table 10. Examples of tasks with the greatest difference in members performing include junior-level personnel inspecting, servicing, or replacing batteries, and soldering or desoldering discrete (common) circuit components or single layer circuit boards using soldering irons. Tasks performed by senior-level NCOs include supervising Precision Measuring Equipment Laboratory Specialists (AFSC 32450), writing recommendations for awards and decorations, and supervising military personnel with AFSC other than 324X0. As expected, the key difference lies in a greater emphasis on supervisory functions for 7-skill level airmen.

Summary

Career ladder progression within the 324X0 career ladder is typical of most ladders. Both 3- and 5-skill level personnel spend the majority of their job time performing technical tasks. Individuals possessing a 7-skill level concentrate their efforts on supervisory and managerial functions, with a substantial decrease in time spent performing tasks technical in nature. The 9- and CEM-skills are totally out of the technical tasks and spend all their time in supervisory or inspection roles.

ANALYSIS OF AFR 39-1 SPECIALTY DESCRIPTIONS

The results of the skill level and job structure analysis were compared with the AFR 39-1 Specialty Descriptions, dated 31 October 1988, for the Precision Measurement Equipment Laboratory Specialist. The descriptions in AFR 39-1 describe in broad terms the tasks and duties performed by members of the various skill-level groups of a career ladder.

Broad descriptions in the AFR 39-1 section for 324X0 personnel accurately reflect actual personnel utilization in the field. The descriptions depict the technical aspects of the job, as well as the major jobs identified in the work structure analysis.

TRAINING ANALYSIS

Occupational survey data provide one of several sources of information which can be used to make training programs more relevant and meaningful to students. The three most commonly used types of occupational survey information are: (1) the percent of first-enlistment (1-48 months TAFMS) or first-job (1-24 months TAFMS) personnel performing tasks covered in the job inventory, (2) ratings of relative difficulty of tasks, and (3) the ratings of relative emphasis which should be placed on tasks for first-enlistment training. These data can be used in examining training documents, such as the Specialty Training Standard (STS) and the Plan of Instruction (POI).

TABLE 9
 REPRESENTATIVE TASKS PERFORMED BY
 DAFSC 32490/00 PERSONNEL
 (N=51)

TASKS	PERCENT MEMBERS PERFORMING
A30 PARTICIPATE IN MEETINGS, SUCH AS STAFF MEETINGS, CONFERENCES, OR WORKSHOPS, OTHER THAN TRAINING	96
B55 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED MATTERS	88
A4 COORDINATE JOB REQUIREMENTS WITH OTHER LABORATORIES OR APPROPRIATE AGENCIES	88
C92 ANALYZE QUALITY ASSURANCE RESULTS	84
C116 INDORSE ENLISTED PERFORMANCE REPORTS (EPR)	82
C103 EVALUATE PERSONNEL FOR RECOGNITION	82
A2 ASSIGN PERSONNEL TO DUTY POSITIONS	82
B88 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY TECHNICIANS (AFSC 32470)	80
C91 ANALYZE MAINTENANCE AND INSPECTION REPORTS OR CHARTS	80
C131 WRITE RECOMMENDATIONS FOR AWARDS, DECORATIONS, OR RECOGNITIONS	80
C106 EVALUATE QUALITY ASSURANCE PROGRAM (QAP) FOR COMPLIANCE WITH QAP REQUIREMENTS	78
A27 ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	78
C95 ASSESS ADEQUACY OF ENVIRONMENTAL CONTROL SYSTEMS	75
B83 INTERPRET POLICIES OR DIRECTIVES FOR SUBORDINATES	73
A20 DEVELOP SELF-INSPECTION PROGRAMS	73
C108 EVALUATE SELF-INSPECTION PROGRAMS	73
C101 EVALUATE MAINTENANCE PRODUCTION REPORTS	71
C104 EVALUATE PMEL MAINTENANCE PROCEDURES	71

TABLE 10

REPRESENTATIVE TASK DIFFERENCES BETWEEN DAFSC 32430/50
AND DAFSC 32470 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC 32430/50 (N=1,409)	DAFSC 32470 (N=463)	DIFFERENCE
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	84	47	37
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	79	43	36
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	73	39	34
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	85	51	34
I427 SOLDER OR DESOLDER ESDS	68	35	33
I422 RECONSTRUCT RUNS OR SOLDERING PADS	59	27	32
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	82	51	31
I406 CLEAN, TREAT, OR REPLACE FILTERS	66	36	30
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	84	57	27
K427 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG MULTIMETERS OR ACCESSORIES	46	19	27
K473 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG VOLTMETERS	44	18	26
I403 CLEAN TMDE USING CHEMICALS	65	39	26

TABLE 10 (CONTINUED)

REPRESENTATIVE TASK DIFFERENCES BETWEEN DAFSC 32430/50
AND DAFSC 32470 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC 32430/50 (N=1,409)	DAFSC 32470 (N=463)	DIFFERENCE
C130 WRITE EPRs	22	75	-53
B55 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED MATTERS	16	69	-53
B87 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY SPECIALISTS (AFSC 32450)	20	72	-52
C104 EVALUATE PERSONNEL FOR RECOGNITION	11	62	-51
C131 WRITE RECOMMENDATIONS FOR AWARDS, DECORATIONS, OR RECOGNITIONS	11	62	-51
A9 DETERMINE WORK PRIORITIES	14	64	-50
C117 INSPECT PERSONNEL FOR COMPLIANCE WITH MILITARY STANDARDS	14	63	-49
B77 INITIATE ACTION TO CORRECT SUBSTANDARD PERFORMANCE OF PERSONNEL	14	62	-48
A1 ASSIGN MAINTENANCE AND REPAIR WORK	18	66	-48
A60 PLAN OR SCHEDULE WORK PRIORITIES	9	55	-47
A39 PLAN OR SCHEDULE WORK ASSIGNMENTS	10	56	-46
B88 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY TECHNICIANS (AFSC 32470)	3	49	-46
A30 PARTICIPATE IN MEETINGS, SUCH AS STAFF MEETINGS, CONFERENCES, OR WORKSHOPS, OTHER THAN TRAINING	14	59	-45

To aid in the examination of the 324X0 specialty training documents, personnel from Lowry Technical Training Center assisted in matching job inventory tasks to appropriate sections of the STS and the POI. With these matchings, comparisons of survey data to the training documents were accomplished. A complete computer listing displaying percent members performing tasks, training emphasis, and task difficulty ratings for each task, along with STS and POI matchings, has been forwarded to the technical school for its use in further detailed reviews of training documents. The AFSC 324X0 Training Requirements Analysis (TRA) is scheduled for publication in September 1990 and will also be made available to the technical school to assist in the review of the training documents.

Training Emphasis (TE) and Task Difficulty (TD)

Training Emphasis (TE) and Task Difficulty (TD) ratings are factors that can assist technical school personnel in deciding what tasks should be emphasized in entry-level training. TE ratings provided by career ladder subject-matter experts yielded an average rating of 1.38, with a standard deviation of 1.27. Therefore, tasks having a rating of 2.65 (average TE + 1 standard deviation) or better, are considered highly recommended for structured training. TD ratings were adjusted to an average of 5.00 and a standard deviation of 1.00. Tasks with ratings of 3.00 or better are perceived as difficult enough to warrant centralized training. For a complete discussion of TE and TD, please refer to the Task Factor Administration section of this report.

Tasks having the highest TE ratings are listed in Table 11. This table includes, for each task, the percentage of total first-job and first-enlistment personnel performing and the TD rating. As illustrated in Table 11, these tasks pertain to a variety of technical functions within the specialty. A majority of these tasks fall into the performing general PMEL maintenance category. In addition, several of these tasks are performed by substantial percentages of first-enlistment personnel and have average to high TD ratings.

Table 12 lists the tasks having the highest TD ratings. The percentage of total first-enlistment, 5-, and 7-skill level personnel performing, and the TE ratings are also included for each task. Most of these tasks relate to PMEL maintenance tasks including aligning, troubleshooting, repairing, and calibrating various types of PMEL equipment. These tasks are not performed by many airmen and have low TE ratings.

While reviewing this section of the report, note that tasks performed by moderate to high percentages of personnel (30 percent or better) in the first-enlistment group may justify resident technical training. TE and TD ratings, composed of the opinions of experienced career ladder personnel, are secondary factors that may assist training developers in deciding which tasks should be emphasized for entry-level training. Those tasks receiving high task factor ratings, but performed by low percentages of first-enlistment personnel, may be more appropriately planned for OJT programs within the career ladder. Low task factor ratings may highlight tasks best left out of training for new personnel. Training decisions are not only weighed against these factors, but should be influenced by many other considerations, including command concerns, safety standards, and criticality of the tasks.

TABLE 11

TASKS RATED HIGHEST IN TRAINING EMPHASIS (TE) FOR 324X0 PERSONNEL
(GREATER THAN 1 STANDARD DEVIATION ABOVE THE AVERAGE)

TASKS	TNG EMPH*	PERCENT MEMBERS PERFORMING		TASK DIFF**
		1ST JOB (N=194)	1ST ENL (N=811)	
K472 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG MULTIMETERS OR ACCESSORIES	5.87	63	51	4.36
M643 ALIGN, TROUBLESHOOT, OR REPAIR ANALOG OSCILLOSCOPES	5.77	38	50	5.28
M668 CALIBRATE ANALOG OSCILLOSCOPES	5.75	40	47	4.07
K492 ALIGN, TROUBLESHOOT, OR REPAIR POWER SUPPLIES	5.74	35	36	5.05
L549 ALIGN, TROUBLESHOOT, OR REPAIR ELECTRONIC COUNTERS	5.74	34	46	5.30
L602 CALIBRATE ELECTRONIC COUNTERS	5.72	39	50	4.03
J464 PERFORM ANALYSIS OF SOLID-STATE CIRCUITS	5.46	28	35	5.33
I427 SOLDER OR DESOLDER ESDs	5.42	66	73	5.24
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	5.38	75	82	2.69
K506 CALIBRATE AC/DC ANALOG MULTIMETERS OR ACCESSORIES	5.36	62	50	3.68
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	5.35	82	83	4.43
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	5.31	67	77	5.25
K473 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG VOLTMETERS	5.24	59	49	4.41
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	5.22	81	85	2.73
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	5.19	49	63	4.41
M647 ALIGN, TROUBLESHOOT, OR REPAIR DIGITAL OSCILLOSCOPES	5.16	23	33	6.48
M672 CALIBRATE DISTORTION ANALYZERS	5.14	29	44	4.60

* Average Training Emphasis = 1.38 with SD of 1.27 (High = 2.65)

** Average Task Difficulty = 5.00 with SD of 1.00

TABLE 12

TASKS RATED HIGHEST IN TASK DIFFICULTY (TD) FOR 324X0 PERSONNEL
(GREATER THAN 1 STANDARD DEVIATION ABOVE THE AVERAGE)

TASKS	TASK DIFF*	PERCENT MEMBERS PERFORMING			TNG EMPH**
		1ST ENL (N=811)	32450 (N=1,154)	32470 (N=463)	
U1226 ALIGN, TROUBLESHOOT, OR REPAIR SAMPLING WAVEFORM DIGITIZING SYSTEMS (SWDS)	7.86	3	4	23	.95
U1229 ALIGN, TROUBLESHOOT, OR REPAIR TITE SPECTRUM ANALYZERS	7.74	2	3	2	.64
E211 DEVELOP OR WRITE COMPUTER PROGRAMS	7.57	5	8	14	.91
U1204 ALIGN, TROUBLESHOOT, OR REPAIR DIGITAL PROCESSING OSCILLOSCOPES (DPO)	7.34	2	3	2	.91
H379 CREATE PAMS PROGRAM FILES	7.34	2	4	11	.59
V1271 ALIGN, TROUBLESHOOT, OR REPAIR STORES MANAGEMENT SYSTEM (SMS) (16U75501-)	7.26	3	5	3	.94
A49 WRITE RECOMMENDATIONS FOR PROCUREMENT OF TMDE FOR DOD AGENCIES, FOREIGN GOVERNMENTS, OR CONTRACTORS	7.24	0	1	5	.10
S1085 DEVELOP AUTOMATIC TEST EQUIPMENT SOFTWARE	7.18	1	2	2	.71
A10 DEVELOP CALIBRATION PROCEDURES FOR FOREIGN- MANUFACTURED TEST EQUIPMENT	7.17	1	2	4	.17
S1073 ALIGN, TROUBLESHOOT, OR REPAIR AVIONIC SYSTEMS TEST STATIONS USING TMDE	7.15	3	7	6	1.28
M663 ALIGN, TROUBLESHOOT, OR REPAIR SPECTRUM ANALYZERS, OTHER THAN TITE SPECTRUM ANALYZERS	7.14	17	19	12	3.46
U1215 ALIGN, TROUBLESHOOT, OR REPAIR MICROWAVE NOISE ANALYZERS	7.12	1	2	2	.69
T1104 ALIGN, TROUBLESHOOT, OR REPAIR ENGINE OIL ANALYSIS SPECTROMETERS (SOAP)	7.12	5	8	10	1.91
U1246 CALIBRATE MICROWAVE NOISE ANALYZERS	7.10	1	2	2	.70
U1258 CALIBRATE TITE SPECTRUM ANALYZERS	7.10	2	3	2	.75
T1137 ALIGN, TROUBLESHOOT, OR REPAIR TACAN RELATED TEST EQUIPMENT, OTHER THAN NAVIGATIONAL TEST SETS	7.08	8	11	9	1.82

* Average Task Difficulty = 5.00 with SD of 1.00

** Average Training Emphasis = 1.38 with SD of 1.27 (High = 2.65)

Analysis of First-Enlistment Personnel

In this study, there are 811 airmen in their first enlistment, representing 42 percent of all 324X0 personnel. These airmen are qualified at either the 3- or 5-skill level. Figure 2 reflects the distribution of these first-enlistment airmen across career ladder jobs. As shown in Figure 2, most of the first-enlistment members are located in three major jobs: Frequency Generating and Measuring Equipment Maintenance, Voltage, Current, and Impedance Equipment Maintenance, and Electromechanical and Dimensional Equipment Maintenance, accounting for 90 percent of all 1-48 months TAFMS respondents.

Table 13 presents a list of representative tasks performed by all 324X0 first-termers. First-enlistment personnel perform an average of 80 tasks. Most of the tasks pertain to the maintenance of PME. Maintenance includes inspecting, servicing, replacing, calibrating, cleaning, soldering and desoldering, aligning, troubleshooting, and repairing.

The highly technical nature of the jobs performed by junior airmen is revealed by the fact that less than 5 percent of their job time involves supervisory or managerial functions, such as those in duties A, B, C, or D (see Table 6). These airmen spend the largest portion of their time performing the technical duties associated with their respective job specialty.

Further indication of the technical orientation of these airmen is the variety and number of equipment worked on or utilized by first-enlistment personnel. Table 14 lists equipment items worked on by 30 percent or more of first-enlistment personnel. Examples of test equipment utilized include wideband amplifiers, frequency converters, digital oscilloscopes, megohmmeters, and wattmeters. A full computer listing of all equipment items and the associated percent members performing is supplied in the Training Extracts and should be used by training specialists to determine which types of equipment should be emphasized for first-term training.

Review of Specialty Training Standard

An STS is intended to provide comprehensive coverage of tasks performed by career ladder personnel. To assess the effectiveness of the AFSC 324X0 STS, Precision Measurement Equipment Specialist and Technician specialty, dated July 1987 (with Change 1, October 1988; Change 2, March 1989; and Change 3, June 1989), STS sections were compared to survey data. STS elements with performance elements were reviewed in terms of TE, TD, and percent members performing information. STS elements containing general career ladder knowledge were not reviewed. Task knowledge and performance elements of the STS were compared against the standard set forth in AFR 8-13 (dated 1 August 1986) and AFR 8-13/ATC Supplement 1 (dated 2 March 1987), Attachment 1, paragraph A1-3c(4) (i.e., include tasks performed or knowledge required by 20 percent or more of the personnel in a skill level (criterion group) of the AFS)).

The traditional method of reviewing an STS is to compare inventory tasks matched against a particular STS item to first-job (1-24 months TAFMS), first-enlistment, and 5- and 7- skill level data. If the STS item has matched tasks performed by 20 percent or more of one of these criteria groups, survey data are said to support inclusion of the STS item. Using this traditional approach with the AFSC 324X0 STS, very little support was found for most items (see Table 15 for examples of nonsupported items). Of the 346 STS items matched with survey tasks, 250 items were not supported, in that tasks matched to the items had less than 20 percent of the criteria groups mentioned above performing them.

FIRST-ASSIGNMENT AFSC 324XO CAREER LADDER JOBS

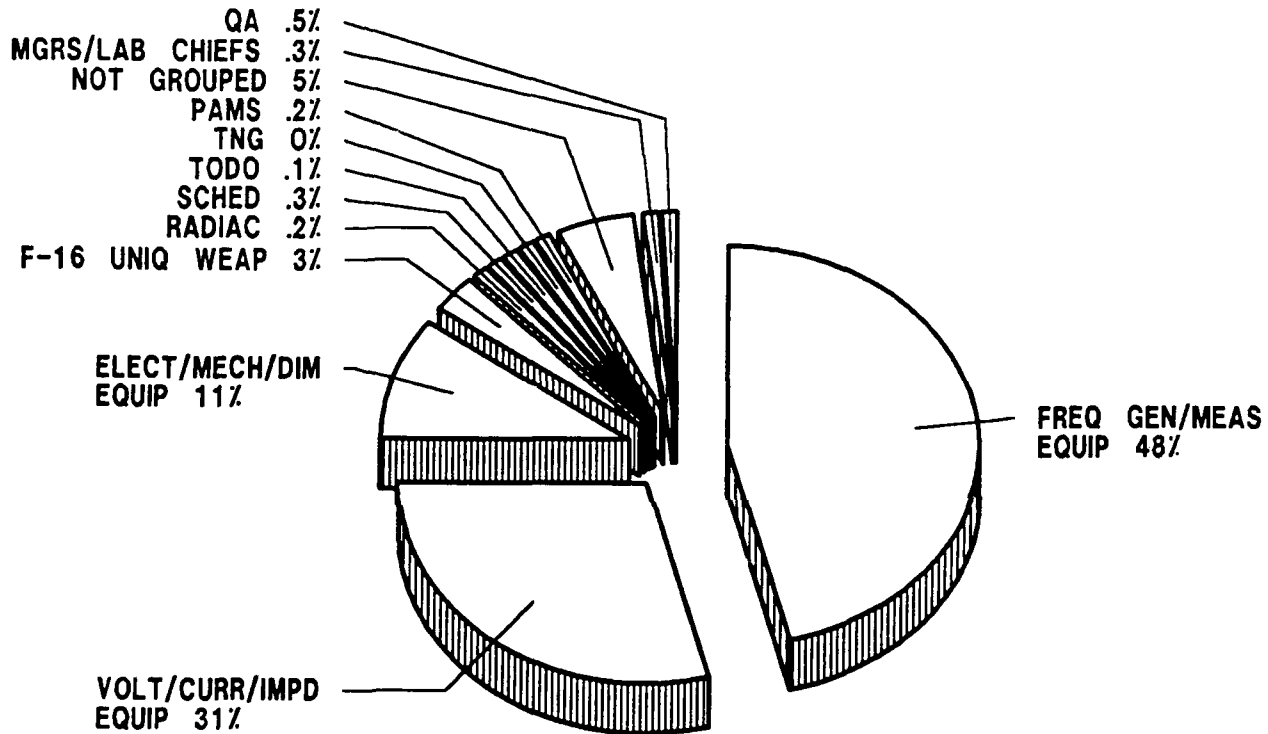


Figure 2

TABLE 13

REPRESENTATIVE TASKS PERFORMED BY AFSC 324X0
 FIRST-ENLISTMENT PERSONNEL
 (1-48 MONTHS TAFMS)

TASKS	PERCENT MEMBERS PERFORMING (N=811)
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	88
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	87
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED /SPECIAL TMDE CERTIFICATION)	85
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	84
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	84
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	82
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS	79
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	77
I427 SOLDER OR DESOLDER ESDs	74
I415 INTERPRET CALIBRATION CORRECTION CHARTS OR GRAPHS	72
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	71
I403 CLEAN TMDE USING CHEMICALS	68
I406 CLEAN, TREAT, OR REPLACE FILTERS	68
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	67
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	63
I422 RECONSTRUCT RUNS OR SOLDERING PADS	62
J438 CALCULATE CURRENT, VOLTAGE, IMPEDANCE, OR POWER PARAMETERS	57
I428 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING PACE SYSTEM	57
K472 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG MULTIMETERS OR ACCESSORIES	51
M643 ALIGN, TROUBLESHOOT, OR REPAIR ANALOG OSCILLOSCOPES	50
K506 CALIBRATE AC/DC ANALOG MULTIMETERS OR ACCESSORIES	50
L602 CALIBRATE ELECTRONIC COUNTERS	50

TABLE 14

TEST EQUIPMENT USED OR OPERATED BY GREATER
 THAN 30 PERCENT OF AFSC 324X0
 FIRST-ENLISTMENT PERSONNEL (1-48 MONTHS TAFMS)
 (PERCENT MEMBERS RESPONDING)

<u>TEST EQUIPMENT</u>	<u>1ST ENLIST (N=811)</u>
Voltmeter, Digital	90
Multimeter, Digital	89
Standard, DC	86
Counter, Frequency	86
Standard, AC	85
Standard, AC/DC	82
Oscillator, Test	79
Counter, Electronic	78
Voltmeter, Differential	77
Generator, Function	75
Resistor, Decade	75
Attenuator	75
Analyzer, Distortion	74
Generator, Time Mark	73
Generators, Signal	70
Probe, High Voltage	70
Generator, Level Sinewave	69
Calibrator, Power Meter	69
Detector, Null	66
Standard, Resistance	66
Calculator, Scientific	65
Oscilloscope, Storage	65
Analyzer, Spectrum	64
Oscilloscope, Digital	64
Generator, Pulse	64
Dividers, AC	62
Millivoltmeter, RF	62
Mount, Thermistor	62
Converter, Thermal	61
Standard, Current	59
Standard, Frequency	59
Tester, Huntron-tracker	59
Generator, Fast Rise Time	58
Oscilloscope, Calibration Package	58
Power Sensor	58
Dividers, High Voltage	57
Generators, RF Signal	55
Termination, Coaxial	55
Generators, Sweep	53
Generator, Synthesized Signal	53

TABLE 14 (CONTINUED)

TEST EQUIPMENT USED OR OPERATED BY GREATER
 THAN 30 PERCENT OF AFSC 324X0
 FIRST-ENLISTMENT PERSONNEL (1-48 MONTHS TAFMS)
 (PERCENT MEMBERS RESPONDING)

<u>TEST EQUIPMENT</u>	<u>1ST ENLIST (N=811)</u>
Head, Sampling	53
Calibrator, Attenuator	53
Current, Shunt	53
Meters, Current	53
Generator, Audio Signal	49
Power Divider or Splitter	49
Voltmeter, Vacuum Tube	49
Detector, Crystal	48
Oscillo Calibrat Fixture (Sig Standardizer)	48
Power Meter, Average	48
Probe, Scope	48
Generator, Modulated RF Signal	47
Multimeter, Passive	47
Power Meter, Peak	47
Power Supply Unit, Regulated	46
Dividers, AC/DC	45
Generator, Constant Amplitude	45
Analyzer, Modulation	44
Tester, Insulation Breakdown	44
Bridge, Resistance	43
Coupler, Directional Coaxial	43
Power Meter, wattmeter	43
Thermocouple	43
Volt/Multimeter, Electronic Analog	43
Amplifier, Wideband	42
Generator, Microwave Signal (2.2 to 40 GHz)	41
Capacitor, Decade	41
Probe, Current	41
Meters, Frequency	40
Test Set, Insulation Breakdown	40
Tester, Battery	40
Filter, Band Pass	39
Capacitor, Standard	38
Standard, Torque Calibration	38
Synthesizer, Frequency	38
Counter, Continuous Wave (CW) Microwave	37
Probe, Logic	37

TABLE 14 (CONTINUED)

TEST EQUIPMENT USED OR OPERATED BY GREATER
 THAN 30 PERCENT OF AFSC 324X0
 FIRST-ENLISTMENT PERSONNEL (1-48 MONTHS TAFMS)
 (PERCENT MEMBERS RESPONDING)

<u>TEST EQUIPMENT</u>	<u>1ST ENLIST (N=811)</u>
Standard, AC/DC Transfer	37
System, Attenuation Measurement	37
Bridge, Capacitance	36
Tester, Diode	36
System, Sampling	35
Voltmeter, Vector	35
Generator, Comb	34
Megohmmeter	34
Milliohmeter	34
Regulator, Voltage	34
Meter, Capacitance	33
Counter, Pulse Microwave	31
Probe, Logic Pulse	31
Synchro and Resolver	31
Voltmeter, Transistorized	31
Converter, Frequency	30
Standard, Synchro/Resolver	30
Tester, Transistor/Diode	30
Wattmeters	30

TABLE 15

EXAMPLES OF AFSC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENT/REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING				TASK DIFF*	TNG EMPH**
	1ST ENL (N=811)	DAFSC 32450 (N=1,154)	DAFSC 32470 (N=463)			
4a PUBLICATIONS						
4a(1) MAINTAIN PMEL REFERENCE LIBRARY	-	-	-			
E237 Initiate or complete technical order library forms, such as AFTO Forms 32, 110, 110A, 110B, 131, and 187	9	12	10	3.97	1.39	
E269 Maintain technical order libraries	9	11	9	5.22	1.54	
E260 Maintain publication libraries, other than technical order libraries	6	6	10	4.05	1.09	
10k PRESSURE						
0840 Calibrate aneroid barometers	5	8	8	4.76	1.53	
0880 Calibrate manometers	7	11	8	4.59	1.66	
0762 Align, troubleshoot, or repair aneroid barometers	5	7	7	5.96	1.27	
0801 Align, troubleshoot, or repair manometers	5	7	6	4.99	1.03	
10m VIBRATION						
L538 Align, troubleshoot, or repair accelerometers or vibration transducers (pickups)	9	9	5	4.92	1.99	
L591 Calibrate accelerometers or vibrations transducers pickups	10	12	9	4.29	2.46	

* Average Task Difficulty = 5.00 with SD of 1.00

** Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

TABLE 15 (CONTINUED)

EXAMPLES OF AFSC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENT/REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING				TASK DIFF*	TNG EMPH**
	1ST ENL (N=811)	DAFSC 32450 (N=1,154)	DAFSC 32470 (N=463)			
11a RESISTANCE						
11a(2&3) ALIGN/TROUBLESHOOT/REPAIR						
R1000 Align, troubleshoot, or repair decade resistors	15	15	8	4.68	2.86	
R1002 Align, troubleshoot, or repair decade voltage dividers	9	9	7	4.97	2.48	
R1011 Align, troubleshoot, or repair Kelvin-Varley voltage dividers	7	7	6	5.72	2.22	
R1013 Align, troubleshoot, or repair low value standard resistors, other than current shunts	6	6	5	5.04	1.57	
R1019 Align, troubleshoot, or repair resistance bridges	5	5	4	5.53	1.56	
R1008 Align, troubleshoot, or repair high value standard resistors	6	7	5	5.34	1.32	
11p PHASE STANDARD						
11p(2&3) ALIGN/TROUBLESHOOT/REPAIR						
R1016 Align, troubleshoot, or repair phase angle standards	5	5	5	6.54	1.72	
11p(4) CALIBRATE						
R1060 Calibrate phase angle standards	7	9	6	5.65	2.14	
11q NULL DETECTOR						
11q(2&3) ALIGN						
R1014 Align, troubleshoot, or repair null detectors	12	12	8	5.32	2.59	
R1007 Align, troubleshoot, or repair galvanometers	3	4	2	4.79	1.27	

* Average Task Difficulty = 5.00 with SD of 1.00

** Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

TABLE 15 (CONTINUED)

EXAMPLES OF AFSC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENT/REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING				TASK DIFF*	TNG EMPH**
	1ST ENL (N=811)	DAFSC 32450 (N=1,154)	DAFSC 32470 (N=463)			
12b TRANSISTOR CURVE TRACER						
12b(2&3) ALIGN/TROUBLESHOOT/REPAIR						
M645 Align, troubleshoot, or repair curve tracers	2	6	5	5.49	1.67	
12b(4) CALIBRATE						
M669 Calibrate curve tracers	7	9	7	4.41	1.76	
12r SIGNATURE ANALYZER						
12r(2&3) ALIGN/TROUBLESHOOT/REPAIR						
K496 Align, troubleshoot, or repair signature analyzers	3	3	3	6.30	1.40	
12r(4) CALIBRATE						
K530 Calibrate signature analyzers	3	2	3	5.17	1.20	
12s LOGIC ANALYZERS						
12s(2&3) ALIGN/TROUBLESHOOT/REPAIR						
M652 Align, troubleshoot, or repair logic analyzers	2	3	3	6.29	1.25	
12s(4) CALIBRATE						
M676 Calibrate logic analyzers	2	2	4	5.08	1.25	
13c THERMISTOR MOUNT						
13c(2&3) ALIGN/TROUBLESHOOT/REPAIR						
N693 Align, troubleshoot, or repair bolometer or thermistor mounts	9	14	11	4.96	2.69	

* Average Task Difficulty = 5.00 with SD of 1.00

** Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

TABLE 15 (CONTINUED)

EXAMPLES OF AFSC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENT/REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING			TASK DIFF*	TNG EMPH**
	1ST ENL (N=811)	DAFSC 32450 (N=1,154)	DAFSC 32470 (N=463)		
13g ATTENUATOR CALIBRATOR					
13g(2&3) ALIGN/TROUBLESHOOT/REPAIR					
N692 Align, troubleshoot, or repair attenuator calibrators	9	13	10	6.80	2.66
13g(4) CALIBRATE					
N724 Calibrate attenuator calibrators	12	18	13	5.60	3.14
14a LINEAR STANDARDS					
14a(2&3) ALIGN/TROUBLESHOOT/REPAIR					
0791 Align, troubleshoot, or repair gauge (working) blocks	3	3	3	5.55	.76
0823 Align, troubleshoot, or repair standard measuring machines, such as super micrometers	4	5	6	6.14	1.11
14a(4) CALIBRATE					
0905 Calibrate standard measuring machines, such as super micrometers	5	8	9	5.82	2.47

* Average Task Difficulty = 5.00 with SD of 1.00

** Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

TABLE 15 (CONTINUED)

EXAMPLES OF AFSC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENT/REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING				TASK DIFF*	TNG EMPH**
	1ST ENL (N=811)	DAFSC 32450 (N=1,154)	DAFSC 32470 (N=463)			
14j PRESSURE STANDARDS						
14j(2&3) ALIGN/TROUBLESHOOT/REPAIR						
0772 Align, troubleshoot or repair dead weight pressure standards	11	13	9		5.12	2.35
0814 Align, troubleshoot or repair pressure standards, other than dead weight pressure standards	8	10	8		5.57	1.65
0762 Align, troubleshoot or repair aneroid barometers	5	7	7		5.96	1.27
0801 Align, troubleshoot or repair manometers	5	7	6		4.99	1.03
0806 Align, troubleshoot or repair mercury barometers	5	6	4		5.50	1.02
14j(4) CALIBRATE						
0840 Calibrate aneroid barometers	5	8	8		4.76	1.53
0851 Calibrate dead weight pressure standards	9	13	10		5.12	2.32
0880 Calibrate manometers	7	11	8		4.59	1.66
0896 Calibrate pressure standards, other than dead weight pressure standards	9	12	8		5.03	2.13
0885 Calibrate mercury barometers	6	9	8		5.20	1.35

* Average Task Difficulty = 5.00 with SD of 1.00

** Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

This lack of support across so many elements is no doubt due to the high degree of diversity of equipment involved within the AFSC 324X0 career ladder. Therefore, a different approach, or perspective, may be warranted for examining the STS to ensure that all major jobs are adequately covered on the STS. Thus, another product was created showing percent members performing data across the various AFSC 324X0 jobs for each STS item. This approach resulted in only 86 STS items being unsupported (i.e., less than 20 percent of incumbents in any job were performing matched tasks). Again, these unsupported items were related to specific pieces of equipment. An example list can be found in Table 16.

For a detailed list of unsupported STS items and the tasks matched to them, refer to the STS printout in the Training Extract. Subject-matter experts need to review these unsupported items and determine the feasibility of removing them from the STS.

An additional area of analysis involves examining tasks not matched to any STS element. Unreferenced tasks performed by at least 20 percent of a group in the career ladder are performed to an extent great enough to be considered for inclusion in the STS. Additionally, tasks with high TE or TD ratings should be examined for possible STS inclusion. Examples of unreferenced PMEL tasks are shown in Table 17. These tasks cover a variety of functions and equipment. A full list of these unreferenced tasks can be found at the end of the STS PRTMOD printout found in the Training Extract. Subject-matter experts should examine all unreferenced tasks to ascertain if any should be added to the STS.

Review of Plan of Instruction (POI)

Based on assistance from technical school subject-matter experts in matching job inventory tasks to POI G3ABR32430-002, dated February 1989, occupational survey data were matched to related training objectives. A similar method to that of the STS analysis was employed to review the POI. Information furnished for consideration includes percent members performing data for first-job (1-24 months TAFMS) and first-enlistment (1-48 months TAFMS) personnel, as well as TE, and TD ratings for individual tasks. Also observed were data of percent members performing data for personnel in specialty jobs, and in the various PMEL laboratories.

POI blocks, units of instruction, and criterion objectives were compared against the standards set forth in Attachment 1, APCR 52-22, dated 17 February 1989 (i.e., at least 30 percent or more of the criterion first-enlistment group should be performing tasks trained, along with sufficiently high TE and TD ratings on those tasks). Per this guidance, tasks trained in the course which do not meet these criteria must be considered for elimination from the formal course if not justified on some other acceptable basis.

Review of the tasks matched to the POI using the standard APCR 52-22 criteria reveals that only a limited number of POI units of instruction or criterion objectives are supported by OSR data. Examples of these unsupported units or objectives are presented in Table 18.

Based on these examples, it is evident that a substantial part of the formal course is not supported by the various OSR data elements which reflect responses from personnel working in the career ladder. Training personnel, career ladder managers, and subject-matter experts should perform an in-depth review of the entire course to determine which, if any, of the units of instruction can be justified for retention. Where retention cannot be supported by OSR data, alternative justification rationale for retention should be documented for future reference.

TABLE 16

EXAMPLES OF AFSC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
 (LESS THAN 20 PERCENT MEMBERS PERFORMING)
 (IN TERMS OF SPECIALTY JOB)

STS ELEMENT/REPRESENTATIVE TASKS	TNG ERPH**	PERCENT MEMBERS PERFORMING							TASK DIFF**	
		FREQ GEN (N=799)	VOLT CURR (N=406)	ELCT MECH (N=203)	F16 PME (N=45)	RAD PME (N=7)				
11p. PHASE STANDARD										
11p PHASE STANDARD										
11p(2) ALIGN										
R1016 Align, troubleshoot, or repair phase angle standards	1.72	3	15	0	0	0	0	0	0	6.54
11p(3) TROUBLESHOOT/REPAIR										
R1016 Align, troubleshoot, or repair phase angle standards	1.72	3	15	0	0	0	0	0	0	6.54
12q PRECISE TIME AND FREQUENCY SYSTEM CONSOLE										
12q(2) ALIGN										
L568 Align, troubleshoot, or repair precise time and frequency consoles	1.70	13	2	0	2	0	0	0	0	6.21
12q(3) TROUBLESHOOT/REPAIR										
L568 Align, troubleshoot, or repair precise time and frequency consoles	1.70	13	2	0	2	0	0	0	0	6.21
12q(4) CALIBRATE										
L621 Calibrate precise time and frequency consoles	1.95	15	2	1	2	0	0	0	0	5.66

* Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)
 ** Average Task Difficulty = 5.00 with SD of 1.00

TABLE 16 (CONTINUED)

EXAMPLES OF A-C SC 324X0 STS ELEMENTS NOT SUPPORTED BY OSR DATA
 (LESS THAN 20 PERCENT MEMBERS PERFORMING)
 (IN TERMS OF SPECIALTY JOB)

STS ELEMENT/REPRESENTATIVE TASKS	TNG	PERCENT MEMBERS PERFORMING							TASK DIFF**
		FREQ GEN (N=799)	VOLT CURR (N=406)	ELCT MECH (N=203)	F16 PME (N=45)	RAD PME (N=7)			
13q NOISE GENERATOR									
13q(2) ALIGN N700 Align, troubleshoot, or repair high frequency (HF) noise generators	1.23	7	0	0	0	0	0	0	6.18
13q(3) TROUBLESHOOT/REPAIR N700 Align, troubleshoot, or repair high frequency (HF) noise generators	1.23	7	0	0	0	0	0	0	6.18
13q(4) CALIBRATE N735 Calibrate high frequency (HF) noise generators	1.03	6	0	0	0	0	0	0	5.72

* Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

** Average Task Difficulty = 5.00 with SD of 1.00

TABLE 17

EXAMPLES OF TASKS PERFORMED BY 20 PERCENT OR MORE AFSC 324X0
GROUP MEMBERS AND NOT REFERENCED TO THE STS
(PERCENT MEMBERS PERFORMING)

TASKS	PERCENT MEMBERS PERFORMING				TNG EMPH*	TASK DIFF**
	1ST ENL (N=811)	DAFSC 32450 (N=1,154)	DAFSC 32470 (N=463)			
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	49	60	35	5.19	4.41	
I428 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING PACE SYSTEM	57	55	34	5.03	5.14	
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET OR CASES	83	84	51	3.47	2.31	
I419 PERFORM PMI ON TMDE	42	43	27	2.83	3.71	
I424 SET UP ELECTROSTATIC SENSITIVE DEVICE (ESD) STATION	34	37	25	3.80	4.28	
J455 INTERPOLATE PARAMETERS	31	36	27	3.45	4.75	
J458 PERFORM ANALYSIS OF DIGITAL INTEGRATED CIRCUITS	33	36	26	4.75	6.06	
J464 PERFORM ANALYSIS OF SOLID-STATE CIRCUITS	35	31	32	5.46	5.33	
J465 PERFORM ANALYSIS OF VACUUM TUBE CIRCUITS	25	29	20	3.39	4.78	
K520 CALIBRATE LOW ACCURACY DIGITAL MULTIMETERS	39	35	21	4.64	3.74	
M650 ALIGN, TROUBLESHOOT, OR REPAIR FAST RISE TIME PLUG-IN UNITS	27	27	15	3.71	6.50	
M670 CALIBRATE DIFFERENTIAL PLUG-IN UNITS	27	32	20	3.71	4.42	
M671 CALIBRATE DIGITAL OSCILLOSCOPES	42	42	23	5.13	4.70	
M674 CALIBRATE FAST RISE TIME PLUG-IN UNITS	35	36	22	5.12	3.89	
M675 CALIBRATE HORIZONTAL TIME BASE PLUG-IN UNITS	42	44	25	4.85	4.29	
M679 CALIBRATE OSCILLOSCOPE CALIBRATION FIXTURE PLUG-INS	38	40	22	4.30	4.83	
M688 CALIBRATE STORAGE OSCILLOSCOPES	38	39	21	4.19	5.20	
R1005 ALIGN, TROUBLESHOOT, OR REPAIR DIGITAL VOLTMETERS	32	28	13	4.53	5.82	

* Average Training Emphasis = 1.38 with SD of 1.27 (high 2.65)

** Average Task Difficulty = 5.00 with SD of 1.00

TABLE 18
 EXAMPLES OF AFSC 324X0 POI ITEMS
 NOT SUPPORTED BY OSR DATA
 (PERCENT FIRST ENLISTMENT PERFORMING)

TASKS	1ST ENL	TASK DIFF*
0091 IV 3b. Given TD 33A1-8-840-1 and malfunctions, theoretically troubleshoot the function generator to a faulty component with a minimum accuracy of 80 percent		
L588 Align, troubleshoot, or repair video amplifiers	7	5.14
0111 V 2a. Given a malfunctioning g143N Decade Resistor, schematic diagram and necessary test equipment, troubleshoot the decade resistor to the faulty component with no more than one instructor assist		
R1000 Align, troubleshoot, or repair decade resistors	15	4.68
0122 V 4b. Given TO 33A1-12-1075-1, determine the proper sequence and purpose of the adjustments used to align the 332 DC Voltage Standard with a minimum accuracy of 80 percent		
R997 Align, troubleshoot, or repair DC voltage standards	17	6.22
0124 V 5a. Given a 5200A/5205A AC Voltage Standard, TO 33K8-4-835-1 and necessary test equipment, calibrate the AC voltage standard with no more than three instructor assists		
R1030 Calibrate AC voltage standards	20	6.51

* Average Task Difficulty = 5.00 with SD of 1.00

To assist career field managers and training personnel in examining POI support or nonsupport, assuming formal training is to be provided to all who enter AFSC 324X0, a computer printout was produced similar to the one run for the STS analysis. Specifically, this product displays percent of first-enlistment members performing according to the type of PMEL the member is assigned. Analysis of these job data showed only 13 POI objectives not supported due to having at least 30 percent of first-enlistment incumbents in at least one lab performing matched tasks. These objectives involved specific pieces of equipment; i.e., the 5200AC Voltage Standard and the 142N Decade Resistor. Table 19 is an example of the objectives that were not supported.

As with the STS, another part of the POI analysis involves examining tasks not matched to any POI objectives. Using the special product, several tasks were found that should be considered for inclusion in the POI. These are tasks performed by very high percentages of first-termers in one or more of the different labs, and also have high training emphasis ratings. An example of these tasks can be found in Table 20. The Training Extract lists these unreferenced tasks at the end of the POI computer run. Basing training decisions on this product, suggests considering these unreferenced tasks for possible inclusion to the POI.

Electronic Principles (EP)

The Electronic Principles Inventory (EPI) (AFPT 90-EPI-825) contains 712 electronic principles, skills, and equipment questions covering 39 electronic principle subject areas. Between April and September 1988, the EPI was administered to fully-qualified 5-skill level 32450 personnel who responded "yes" or "no" to the 712 EPI items, indicating the electronic principles, skills, and equipment they use in their present job.

Based on the resulting data, AFSC 32450 personnel were found covering a wide range of electronic principles in performing their jobs. Table 21 lists those electronic areas where 30 percent or more 32450 airmen responded "yes" to performing in their job. These data can be extremely useful to subject-matter experts when evaluating those portions of the STS and POI concerning electronic fundamentals or principles.

JOB SATISFACTION ANALYSIS

Comparisons of group perceptions of their jobs provide career ladder managers with a means toward understanding some of the factors affecting job performance of today's airmen. These perceptions are gathered from incumbents' responses to five job satisfaction questions covering job interest, perceived utilization of talents, perceived utilization of training, sense of accomplishment, and reenlistment intentions. The responses of the current survey sample are then analyzed by making several comparisons: (1) among TAFMS groups of a comparative sample of personnel from other Mission Equipment Maintenance specialists surveyed in 1989 (AFSCs 362X4, 411X2A, 454X0A/B, 451X4); (2) between current and previous survey TAFMS groups; and (3) across specialty job groups identified in the **SPECIALTY JOBS** section of this report.

TABLE 19

EXAMPLES OF AFSC 324X0 POI ITEMS NOT SUPPORTED BY OSR DATA
(PERCENT FIRST ENLISTMENT PERFORMING)
(BY TYPE LAB)

TASKS	TYPE LAB					
	IIA	IIB	IIC	III	F15	F16 II/IV
0040 II 1c. Given a TO 33D7-45-77-1 (Extract), a block diagram and malfunctions, theoretically troubleshoot the 5100B Instrument Calibrator to the faulty stage with a minimum accuracy of 80%.	10	14	12	0	16	1
R989 Align, troubleshoot, or repair AC/DC instrument calibrators	10	14	12	0	16	1
0048 II 2g. Given TO 33D7-45-51-1 and malfunctions, use the technical order to theoretically troubleshoot the 5200A AC Calibrate to the faulty stage with a minimum accuracy of 80%.	12	15	13	0	29	3
R0987 Align, troubleshoot, or repair AC voltage standards	12	15	13	0	29	3
0091 IV 3b. Given TD 33A1-8-840-1 and malfunctions, theoretically troubleshoot the function generator to a faulty component with a minimum accuracy of 80 percent	8	8	4	0	16	1
L588 Align, troubleshoot, or repair video amplifiers	8	8	4	0	16	1
0111 V 2a. Given a malfunctioning 143N Decade Resistor, schematic diagram and necessary test equipment, troubleshoot the decade resistor to the faulty component with no more than one instructor assist	10	13	14	0	22	4
R1000 Align, troubleshoot, or repair decade resistors	10	13	14	0	22	4

TABLE 20

EXAMPLES OF TECHNICAL TASKS WITH GREATER THAN 30 PERCENT MEMBERS PERFORMING
AND NOT REFERENCED TO POI 32430-002
(PERCENT FIRST ENLISTMENT PERFORMING)

TASKS	1-48		TASK DIFF**
	MONTHS TAFMS (N=143)	TNG EMPH*	
I124 SET UP ELECTROSTATIC SENSITIVE DEVICE (ESD STATIONS)	34	3.80	4.28
J458 PERFORM ANALYSIS OF DIGITAL INTEGRATED CIRCUITS	33	4.75	6.06
J464 PERFORM ANALYSIS OF SOLID-STATE CIRCUITS	35	5.46	5.33
J442 COMPUTE PERCENT OF MODULATIONS	35	4.48	4.31
K471 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG AMMETERS	39	4.56	4.30
K473 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG VOLTMETERS	49	5.24	4.41
K484 ALIGN, TROUBLESHOOT, OR REPAIR LOW ACCURACY DIGITAL MULTIMETERS	37	4.73	4.70
K488 ALIGN, TROUBLESHOOT, OR REPAIR OHMMETERS	38	4.29	4.14
K500 ALIGN, TROUBLESHOOT, OR REPAIR VACUUM TUBE VOLTMETERS	32	3.42	4.45
K507 CALIBRATE AC/DC ANALOG VOLTMETERS	47	4.86	3.68
K520 CALIBRATE LOW ACCURACY DIGITAL MULTIMETERS	39	4.46	3.74
K534 CALIBRATE VACUUM TUBE VOLTMETERS	30	3.57	3.97
K493 ALIGN, TROUBLESHOOT, OR REPAIR RADIO FREQUENCY (RF) MILLIVOLTMETERS	31	4.22	4.31
K505 CALIBRATE AC/DC ANALOG AMMETERS	37	4.03	3.59
K522 CALIBRATE OHMMETERS	41	4.11	3.33
K528 CALIBRATE RF MILLIVOLTMETERS	35	4.33	4.80
L539 ALIGN, TROUBLESHOOT, OR REPAIR AUDIO FREQUENCY OSCILLATORS	35	4.83	5.00
L592 CALIBRATE AUDIO FREQUENCY OSCILLATORS	34	4.61	4.01
L629 CALIBRATE SQUARE WAVE GENERATORS	33	4.67	4.16
L631 CALIBRATE SYNTHESIZED SIGNAL GENERATORS	31	4.93	5.10
M655 ALIGN, TROUBLESHOOT, OR REPAIR OSCILLOSCOPE CALIBRATION FIXTURE PLUG-INS	37	3.21	5.28
M671 CALIBRATE DIGITAL OSCILLOSCOPES	42	5.13	4.70

* Average Training Emphasis = 1.38 with SD of 1.27 (high = 2.65)

** Average Task Difficulty = 5.00 with SD of 1.00

TABLE 21

AFSC 324X0 ELECTRONICS FUNDAMENTALS STS AREAS WITH 30 PERCENT
OR MORE DAFSC 324X0 PERSONNEL PERFORMING ASSOCIATED TASKS
(DATA COLLECTED THROUGH RESPONSES TO THE EPI BY 300 CAREER LADDER MEMBERS)

STS ELEMENTS

- | | |
|---|--|
| 1. Basic Terms | 24. Solder/Desolder |
| 2. Basic Circuits | 25. Solderless Connectors |
| 3. Basic Circuit Calculation | 26. Test Equipment Usage |
| 4. Resistors | 27. Transistor Amplifier Circuits |
| 5. Relays/Solenoids | 28. Operational Amplifiers |
| 6. Inductors | 29. Electron Tube Amplifiers |
| 7. Capacitors | 30. Power Supply Circuits |
| 8. Transformers | 31. Voltage Regulators |
| 9. Three Phase Transformers | 32. Resistive/Capacitive/Inductive
(RCL) Circuits |
| 10. AC and DC Motors | 33. Wave Generating Circuits |
| 11. AC and DC Generators | 34. Frequency Generating Circuits |
| 12. Synchro/Servos | 35. Computers |
| 13. Choppers | 36. Frequency Sensitive Filters |
| 14. Transducers | 37. Limiter Circuits |
| 15. Meter Movements | 38. Digital Numbering Systems |
| 16. Solid State Diodes and Special Devi | 35. Digital Logic Functions |
| 17. Bipolar Junction Transistors | 36. Logic Circuits |
| 18. Integrated Circuits | 37. Converters |
| 19. Electron Tubes | 38. Wave Guides |
| 20. Transmitters/Receivers | 39. Microprocessor Controlled
Systems |
| 21. Clamper Circuits | 40. Resonant Cavities |
| 22. Transmission Lines | 41. Photosensitive Devices |
| 23. Microwave oscillators & Amplifiers | |

First-enlistment (1-48 months TAFMS), second-enlistment (49-96 months TAFMS), and career (97+ months TAFMS) group data are listed in Table 22 and are compared to corresponding enlistment groups from other Mission Equipment Maintenance AFSCs surveyed during the previous calendar year. These data give a relative measure of how the job satisfaction of AFSC 324X0 personnel compares with that of other similar Air Force specialties. Generally, enlistment groups of the DAFSC 324X0 sample indicate higher levels of job satisfaction than do those of the comparative sample. However, all PMEL respondent groups indicated lower intentions of reenlisting.

An indication of changes in job satisfaction perceptions within the career ladder is provided in Table 23, where TAFMS group data for 1990 AFSC 324X0 survey respondents are presented along with data from respondents to the last occupational survey report of the career ladder. Generally, perceptions of job satisfaction, including reenlistment intentions and job interest, have decreased since the 1984 OSR.

Table 24 presents job satisfaction data for the major jobs (clusters and independent job types) identified in the career ladder structure for AFSC 324X0. An examination of these data can reveal the influences performing certain jobs may have on overall job satisfaction. Job satisfaction indicators for the specialty job groups suggest members across the career ladder are generally content. Nine of the eleven jobs responded with high levels of satisfaction. Over 78 percent of each of the career ladder jobs rated their job as "interesting." Only PMEL Scheduling personnel were basically dissatisfied, with over 40 percent of the PMEL Scheduling IJT describing their jobs as "so-so" or "dull." Similarly, over 83 percent of each of the major career ladder jobs also indicated a high perceived use of training, excluding the Technical Order Distribution Office at 67 percent and the PMEL Scheduling IJT at 54 percent. As a whole, members in the PMEL Scheduling reflect slightly lower levels of satisfaction when compared to the other jobs. Members of this job expressed less utilization of their talents and training, as well as dissatisfied feelings toward accomplishments achieved from their work. On the other hand, the members in the other major specialty jobs display high levels of overall satisfaction, with greater than 50 percent responding positively across all indicators.

ANALYSIS OF CONUS VERSUS OVERSEAS GROUPS

Comparisons were made between the tasks performed and the background data for DAFSC 32450 personnel assigned to the continental United States (CONUS, N=844) versus those assigned overseas (N=306). An examination of the tasks and duties performed by the two groups indicates only minor differences in equipment maintained and number of tasks performed. In the special interest area of this study, we find that more Overseas personnel are in labs that utilize lasers (38 percent) compared to the CONUS personnel (19 percent), and the Overseas labs receive more equipment with fiber optics (18 percent) compared to the CONUS labs (12 percent).

A review of the average number of tasks performed by these two groups indicates that overseas personnel tend to perform slightly more tasks (131 tasks) than their CONUS counterparts (125 tasks). Data also indicate that, although the TAFMS for the two groups is equal, overseas personnel have a slightly longer average time in career field (56 months) than CONUS personnel (49 months). Job satisfaction indicators say that CONUS personnel are more satisfied with a sense of accomplishment from work, and they feel that both their training and talents are more greatly utilized than do the Overseas personnel.

TABLE 22

COMPARISON OF JOB SATISFACTION DATA BY 324X0 AND COMPARATIVE SAMPLE GROUPS
(PERCENT MEMBERS RESPONDING)

	1-48 MOS TAFMS		49-96 MOS TAFMS		97+ MOS TAFMS	
	324X0 (N=811)	COMP SAMPLE (N=2,658)	324X0 (N=492)	COMP SAMPLE (N=1,930)	324X0 (N=600)	COMP SAMPLE (N=2,575)
<u>EXPRESSED JOB INTEREST:</u>						
INTERESTING	86	76	86	75	85	77
SO-SO	8	15	9	16	9	14
DULL	5	8	4	8	4	8
<u>PERCEIVED USE OF TALENTS:</u>						
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	90 9	84 15	90 9	85 14	90 9	85 15
<u>PERCEIVED USE OF TRAINING:</u>						
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	94 6	88 12	92 8	83 16	86 13	82 18
<u>SENSE OF ACCOMPLISHMENT FROM WORK:</u>						
SATISFIED	80	76	75	75	77	74
NEUTRAL	9	14	9	12	8	11
DISSATISFIED	10	9	15	11	14	14
<u>REENLISTMENT INTENTIONS:</u>						
YES, OR PROBABLY YES	55	61	57	72	67	75
NO, OR PROBABLY NO	44	37	42	26	10	10
PLAN TO RETIRE	*	2	*	1	22	14

NOTE: Comparative Sample of Mission Equipment Maintenance AFSCs surveyed in 1989. Includes AFSCs 362X4, 411X2A, 454X0A/B, and 451X4

Columns may not add to 100 percent due to nonresponse and rounding

* Denotes less than 1 percent responding

TABLE 23

CURRENT AND PREVIOUS JOB SATISFACTION INDICATORS
(PERCENT MEMBERS RESPONDING)

	<u>1-48 MOS TAFMS</u>		<u>49-96 MOS TAFMS</u>		<u>97+ MOS TAFMS</u>	
	1989 (N=811)	1984 (N=501)	1989 (N=492)	1984 (N=297)	1989 (N=600)	1984 (N=1,613)
<u>EXPRESSED JOB INTEREST:</u>						
INTERESTING	88	93	84	86	85	73
SO-SO	8	3	11	8	9	15
DULL	4	3	4	4	410	
<u>PERCEIVED USE OF TALENTS:</u>						
FAIRLY WELL TO PERFECTLY	91	92	90	90	90	81
LITTLE OR NOT AT ALL	9	7	9	10	9	18
<u>PERCEIVED USE OF TRAINING:</u>						
FAIRLY WELL TO PERFECTLY	94	91	92	87	86	75
LITTLE OR NOT AT ALL	6	8	8	11	13	24
<u>REENLISTMENT INTENTIONS:</u>						
YES, OR PROBABLY YES	55	58	57	54	67	66
NO, OR PROBABLY NO	44	41	42	44	10	14

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

TABLE 24

JOB SATISFACTION DATA BY CAREER LADDER JOBS
(PERCENT MEMBERS RESPONDING)

	FREQ GENERATING AND MEA EQUIP CLUSTER (STG54)	VOLTAGE, CURR, & IMPEDANCE EQUIP CLUSTER (STG55)	F-16 UNIQUE WPNS SYS PME CLUSTER (STG67)	ELECTROMECHANICAL AND DIMENSIONAL EQUIP CLUSTER (STG33)	PMEL MGRS & LAB CHIEFS CLUSTER (STG38)
<u>EXPRESSED JOB INTEREST:</u>					
INTERESTING	86	86	84	78	89
SO-SO	9	10	11	12	8
DULL	5	4	4	9	2
<u>PERCEIVED USE OF TALENTS:</u>					
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	93 8	90 10	83 18	91 8	94 7
<u>PERCEIVED USE OF TRAINING:</u>					
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	94 6	94 6	83 18	91 8	84 16
<u>SENSE OF ACCOMPLISHMENT FROM WORK:</u>					
SATISFIED	79	78	71	71	82
NEUTRAL	9	9	13	11	6
DISSATISFIED	11	12	16	17	12
<u>REENLISTMENT INTENTIONS:</u>					
YES, OR PROBABLY YES	56	65	56	57	57
NO, OR PROBABLY NO	40	34	44	37	12
PLAN TO RETIRE	3	1	0	4	31

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

TABLE 24 (CONTINUED)

JOB SATISFACTION DATA BY CAREER LADDER JOBS
(PERCENT MEMBERS RESPONDING)

	PMEL QLT ASSURANCE CLUSTER (STG76)	PMEL AUTOMATED MGT SUBSYS (PAMS) CLUSTER (STG156)	PMEL TECH TRAINING CLUSTER (STG42)	TECH ORDER DISTRIBUTION OFFICE IJT (STG242)	PMEL SCHEDULING IJT (STG349)	RADIAC PME IJT (STG555)
<u>EXPRESSED JOB INTEREST:</u>						
INTERESTING	79	90	82	83	47	57
SO-SO	13	0	18	17	7	43
DULL	5	10	0	0	33	0
<u>PERCEIVED USE OF TALENTS:</u>						
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	95 5	80 20	87 13	67 33	54 33	57 43
<u>PERCEIVED USE OF TRAINING:</u>						
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	97 3	80 20	87 13	67 33	47 40	100 0
<u>SENSE OF ACCOMPLISHMENT FROM WORK:</u>						
SATISFIED	74	85	84	50	53	57
NEUTRAL	16	0	5	17	0	0
DISSATISFIED	11	15	11	33	33	43
<u>REENLISTMENT INTENTIONS:</u>						
YES, OR PROBABLY YES	74	85	71	67	40	50
NO, OR PROBABLY NO	18	10	16	17	33	14
PLAN TO RETIRE	8	5	13	17	13	0

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

SPECIAL ISSUES

During the survey process, information can be gathered to address items of concern to career ladder training managers. AFSC 324X0 Functional Managers were particularly interested in what "common" tasks were being performed by PMEL members by the type of PMEL they are assigned. An example task list for each PMEL can be found for the 32450 skill-level personnel at Appendix B. A full listing of tasks performed within each PMEL by total career ladder, and a breakout by type PMEL and skill level within each PMEL will be included in the Training Extract.

Training managers were also interested in the use of equipment with fiber optics, lasers, and torque wrenches by first-enlistment personnel and other PMEL members, as these are relatively new technologies being introduced into the PMEL career ladder. Table 25 presents the percent members using these equipment in their labs.

IMPLICATIONS

The primary purpose of this occupational survey report is to assist in the updating of training requirements and technical training in the PMEL career ladder. New equipment has been issued, and most PMEL standards have been replaced with state-of-the-art automatic test equipment. Changes in maintenance concepts have also occurred since the last OSR; i.e., circuit board-level maintenance instead of component-level maintenance. The survey data will also assist in giving the Technical School Training Manager broad coverage of tasks performed by Type IV PMELs, as those which support the F-15 and F-16 weapon systems were not included in the previous OSR.

Analysis of the 324X0 career ladder structure identified eight clusters and three independent job types. These groupings remained consistent with jobs found in the previous OSR, with the exception of Scheduling, TODO, and PAMS. The additional jobs identified are due to advancements in the career ladder. Overall, the utilization of career ladder personnel is accurately reflected in the AFR 39-1 Specialty Descriptions.

Analysis of career ladder documents indicates the STS and POI have little support when applying the guidelines outlined in ATCR 52-22. This lack of support is probably due to the diversity in scope and content of PME jobs. Only when survey data were examined by job and type PMEL, was much support found. Training personnel and subject-matter experts need to review these documents to determine possible areas for deletion and/or inclusion.

Job satisfaction responses were similar or slightly higher than that of a comparative sample of other mission maintenance specialists, but satisfaction has slightly decreased in the PMEL career field since the previous survey in 1984. Indicators across career ladder specialty jobs exhibited displeasure among members performing PMEL scheduling functions. This slightly lower level of satisfaction with this job should alert Air Force managers and supervisors to be aware of this dissatisfying job, and attempt to implement measures to improve it.

The findings of this OSR come directly from survey data collected from Precision Measurement Equipment specialists worldwide. These data are readily available to training and utilization personnel, functional managers, and any 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 whenever a training or utilization decision is made.

TABLE 25

SPECIAL EQUIPMENT USED BY PMEL
(PERCENT MEMBERS USING BY TAFMS)

	<u>1-48</u> <u>MOS TAFMS</u> <u>(N=143)</u>	<u>49-96</u> <u>MOS TAFMS</u> <u>(N=492)</u>	<u>97+</u> <u>MOS TAFMS</u> <u>(N=600)</u>
<u>DOES LAB</u>			
USE LASERS	28	19	20
RECEIVE EQUIP WITH FIBER OPTICS	16	12	14
CALIBRATE TORQUE WRENCHES/ DEVICES	63	55	49

APPENDIX A

**SELECTED REPRESENTATIVE TASKS PERFORMED BY CAREER
LADDER SPECIALTY JOB GROUPS**

TABLE I (CONTINUED)

FREQUENCY GENERATING AND MEASURING EQUIPMENT CLUSTER
(STG54)

GROUP SIZE: 799
 PERCENT OF SAMPLE: 42%
 PREDOMINANT PAYGRADES: E4 (3-5)

AVERAGE TAFMS: 69 MONTHS
 AVERAGE TICF: 57 MONTHS

TASKS	PERCENT MEMBERS PERFORMING
L574 ALIGN, TROUBLESHOOT, OR REPAIR RF SIGNAL GENERATORS	64
L603 CALIBRATE FAST RISE TIME GENERATORS	64
I428 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING PACE SYSTEM	63
L558 ALIGN, TROUBLESHOOT, OR REPAIR FUNCTION GENERATORS	63
L597 CALIBRATE CONSTANT AMPLITUDE GENERATORS	63
M688 CALIBRATE STORAGE OSCILLOSCOPES	63
L539 ALIGN, TROUBLESHOOT, OR REPAIR AUDIO FREQUENCY OSCILLATORS	62
L581 ALIGN, TROUBLESHOOT, OR REPAIR TIME MARK GENERATORS	61
L631 CALIBRATE SYNTHESIZED SIGNAL GENERATORS	61
M674 CALIBRATE FAST RISE TIME PLUG-IN UNITS	60
M666 ALIGN, TROUBLESHOOT, OR REPAIR VERTICAL PLUG-IN UNITS	58
M651 ALIGN, TROUBLESHOOT, OR REPAIR HORIZONTAL TIME BASE PLUG-IN UNITS	56
M689 CALIBRATE TDRs	56
M647 ALIGN, TROUBLESHOOT, OR REPAIR DIGITAL OSCILLOSCOPES	51
J438 CALCULATE CURRENT, VOLTAGE, IMPEDANCE, OR POWER PARAMETERS	50

EQUIPMENT USED: AMPLIFIER, AUDIO/MICROWAVE ANALYZER, ILS/VOR MODULATION/SPECTRUM ATTENUATOR
 CALIBRATOR, ATTENUATOR/PEAK POWER/RF POWER CONSOLE, PRECISE TIME AND FREQUENCY SYSTEM COUNTER, CW MICROWAVE COUPLER, DIRECTIONAL COAXIAL/WAVEGUIDE DETECTOR, CRYSTAL FILTER, BANDPASS/BAND REJECT GENERATOR, AUDIO SIGNAL/COMB/CONSTANT AMPLITUDE/ GENERATOR, FAST RISE TIME/MICROWAVE SIGNAL GENERATOR, MODULATED RF SIGNAL/RF SIGNAL GENERATOR, SIGNAL/SWEEP/SWEPT FUNCTION HEADS, NORMALIZER/SAMPLING METER, FREQUENCY/PERCENT-OF-MODULATION/SWR/VSWR MIXER

TABLE I (CONTINUED)

FREQUENCY GENERATING AND MEASURING EQUIPMENT CLUSTER
(STG54)

GROUP SIZE: 799

PERCENT OF SAMPLE: 42%

PREDOMINANT PAYGRADES: E4 (3-5)

AVERAGE TAFMS: 69 MONTHS

AVERAGE TICF: 57 MONTHS

EQUIPMENT USED: OSCILLATOR, TEST/DIGITAL/CALIBRATION PACKAGE
OSCILLO CALIBRAT FIXTURE (SIG STANDARDIZER)
POWER DIVIDER OR SPLITTER
POWER METER, AVERAGE/PEAK/WATTMETER
POWER SENSOR
STANDARD, FREQUENCY
SYNTHESIZER, FREQUENCY
SYSTEM, ATTENUATION MEASUREMENT
SYSTEM, PMCS/SAMPLING
TERMINATION, COAXIAL
TEST SET, IFFF SIF TRANSPONDER
TIME DOMAIN REFLECTOMETER
TIME INTERVAL COUNTER/PLUG IN WATTMETER

TABLE II (CONTINUED)

VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT CLUSTER
(STG55)

GROUP SIZE: 406
 PERCENT OF SAMPLE: 42%
 PREDOMINANT PAYGRADES: E4 (3-5)

AVERAGE TAFMS: 57 MONTHS
 AVERAGE TICF: 42 MONTHS

TASKS	PERCENT MEMBERS PERFORMING
K534 CALIBRATE VACUUM TUBE VOLTMETERS	65
R1005 ALIGN, TROUBLESHOOT, OR REPAIR DIGITAL VOLTMETERS	62
R1004 ALIGN, TROUBLESHOOT, OR REPAIR DIGITAL MULTIMETERS, OTHER THAN LOW ACCURACY DIGITAL MULTIMETERS	59

EQUIPMENT USED: AMPLIFIER, TRANSCONDUCTANCE
 AMPLIFIER, WIDEBAND
 ANALYZER, DISTORTION
 ANALYZER, SPECTRUM
 BRIDGE, CAPACITANCE
 BRIDGE, INDUCTANCE
 CAPACITOR, DECADE
 CAPACITOR, STANDARD
 CELL, STANDARD
 CURRENT SHUNT
 DETECTOR, NULL
 DIVIDERS, AC/DC
 METER, CURRENT
 PROBE, HIGH VOLTAGE
 RESISTOR, DECADE
 STANDARD, CURRENT
 SYNCHRO AND RESOLVER
 TEST SET, INSULATION BREAKDOWN
 VOLTMETER, DIFFERENTIAL
 VOLTMETER, VACUUM TUBE

TABLE III

F-16 UNIQUE WEAPONS SYSTEM PRECISION MEASURING EQUIPMENT (PME) CLUSTER
(STG67)

GROUP SIZE: 45	AVERAGE TAFMS: 58 MONTHS
PERCENT OF SAMPLE: 2%	AVERAGE TICF: 49 MONTHS
PREDOMINANT PAYGRADES: E4 (3-5)	TYPE PMEL ASSGN: IV: 82% II/IV: 13%

TASKS	PERCENT MEMBERS PERFORMING
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	93
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	91
V1269 ALIGN, TROUBLESHOOT, OR REPAIR PRELOAD ARMAMENT CIRCUIT TEST SETS (16U75060-)	91
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	89
V1270 ALIGN, TROUBLESHOOT, OR REPAIR SMS BREAKOUT BOXES (16UE75517-)	89
V1271 ALIGN, TROUBLESHOOT, OR REPAIR STORES MANAGEMENT SYSTEM (SMS) (16U75501-)	89
V1282 CALIBRATE SMSs (16U75501-)	89
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	84
V1272 ALIGN, TROUBLESHOOT, OR REPAIR STORES RELEASE EQUIPMENT (SRE) (16U75500-)	84
V1281 CALIBRATE SMS BREAKOUT BOXES (16UE75517-)	84
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	82
V1283 CALIBRATE SREs (16U75500-)	82
V1280 CALIBRATE PRELOAD ARMAMENT CIRCUIT TEST SETS (16U75060-)	81
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	80
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	80
V1264 ALIGN, TROUBLESHOOT, OR REPAIR CHAFF/FLARES DISPENSER TEST SETS (AN/ALM-177-)	80
V1275 CALIBRATE CHAFF/FLARES DISPENSER TEST SETS (AN/ALM-177-)	78
V1278 CALIBRATE PAL/USG/MUXS (568-)	78
I427 SOLDER OR DESOLDER ESDs	76
V1276 CALIBRATE EPU _s (912476-)	76
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS	73
V1267 ALIGN, TROUBLESHOOT, OR REPAIR PERMISSIVE ACTION LINK/ UNIQUE SIGNAL GENERATOR/MULTIPLEXERS (PAL/USG/MUX)(568-)	73
O921 CALIBRATE TORQUE WRENCHES	69
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	67
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	64

TABLE IV (CONTINUED)

ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT CLUSTER
(STG33)

GROUP SIZE: 203
 PERCENT OF SAMPLE: 11%
 PREDOMINANT PAYGRADES: E4 (3-5)

AVERAGE TAFMS: 76 MONTHS
 AVERAGE TICF: 64 MONTHS
 TYPE PMEL ASSGN: IIB: 71%; IIA: 13%;
 IIC: 8%

TASKS	PERCENT MEMBERS PERFORMING
0922 CALIBRATE VERNIER CALIPERS	71
0807 ALIGN, TROUBLESHOOT, OR REPAIR MICROMETERS, OTHER THAN OPTICAL MICROMETERS	70
0809 ALIGN, TROUBLESHOOT, OR REPAIR OXYGEN OR LOX GAUGES	69
0818 ALIGN, TROUBLESHOOT, OR REPAIR PUSH-PULL GAUGES	69
0773 ALIGN, TROUBLESHOOT, OR REPAIR DEAD WEIGHT TESTERS	68
0858 CALIBRATE DIGITAL THERMOMETERS	68
0765 ALIGN, TROUBLESHOOT, OR REPAIR BELLOWS OR DIAPHRAGM PRESSURE GAUGES	67
0926 CLEAN AND INSPECT OXYGEN EQUIPMENT	67
0843 CALIBRATE BELLOWS OR DIAPHRAGM PRESSURE GAUGES	66
0868 CALIBRATE FORCE GAUGES	66
0838 CALIBRATE AIRCRAFT WEIGHING KITS	65
E203 COMPLETE AFTO FORMS 249 (TMDE CALIBRATION DATA)	63

EQUIPMENT USED: ANALYTICAL BALANCE SCALE
 AUTOCOLLIMATOR
 BAROMETER, ANERIOD/DIGITAL/MERCURY
 BLOCK, ANGLE/GAUGE/RISER/
 CALIBRATION TRAILER, JETS
 CALIBRATOR, FORCE/SINE BAR/THERMOCOUPLE
 CELL, LOAD/SALT
 CHAMBER, HUMIDITY
 CHAMBER, PLENEUM/VACUUM/PRESSURE
 COLLIMATOR
 COMPARATOR, GUAGE BLOCK
 CONTROLLER/MONITOR, PNEUMATIC PRESSURE
 CYLINDRICAL SQUARE
 DEVICE, DIMENSIONAL MEASURING
 DYNAMOMETER
 EQUIPMENT, OXYGEN CLEANING
 GAUGE, ANLOGUE PRESSURE/ELECTRONIC HEIGHT/FORCE
 GAUGE, HEIGHT/PLUG, WIRE, PIN/STANDARD

TABLE IV (CONTINUED)

ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT CLUSTER
(STG33)

GROUP SIZE: 203
PERCENT OF SAMPLE: 11%
PREDOMINANT PAYGRADES: E4 (3-5)

AVERAGE TAFMS: 76 MONTHS
AVERAGE TICF: 64 MONTHS
TYPE PMEL ASSGN: IIB: 71%; IIA: 13%;
IIC: 8%

EQUIPMENT USED: HYGROTHERMOGRAPH
LEVEL, BENCH/BLOCK/STRIDE
MANOMETER
METER, FLOW
MICROMETER, DEPTH/INSIDE/OUTSIDE/SUPER/THREAD
MONOCHROMATIC LIGHT
OPTICAL FLAT/MIRROR
PARALLEL BAR/BOX
PLANAKATOR
PLATE, ANGLE/SURFACE
PLATINUM RESISTANCE THERMOMETER
PRECISION BALLS
PRESS, FORCE
SINEPLATE
STANDARD, FLOW
STRAIGHT EDGE
TEMPERATURE BATH
TENSIO METER
THEODOLITE
TRANSIT
WEIGHT, MASS/STANDARD

TABLE V

PMEL MANAGERS & LABORATORY CHIEFS CLUSTER
(STG38)

GROUP SIZE: 257
 PERCENT OF SAMPLE: 13%
 PREDOMINANT PAYGRADES: E7 (5-8)

AVERAGE TAFMS: 196 MONTHS
 AVERAGE TICF: 147 MONTHS
 TYPE PMEL ASSGN: IIB: 56%; II/IV: 11%;
 N/A: 10%

TASKS	PERCENT MEMBERS PERFORMING
C130 WRITE EPRs	89
B55 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED MATTERS	87
A30 PARTICIPATE IN MEETINGS, SUCH AS STAFF MEETINGS, CONFERENCES, OR WORKSHOPS, OTHER THAN TRAINING	86
C131 WRITE RECOMMENDATIONS FOR AWARDS, DECORATIONS, OR RECOGNITIONS	86
E214 ESCORT VISITORS THROUGH FACILITIES	85
C103 EVALUATE PERSONNEL FOR RECOGNITION	84
C117 INSPECT PERSONNEL FOR COMPLIANCE WITH MILITARY STANDARDS	84
B77 INITIATE ACTION TO CORRECT SUBSTANDARD PERFORMANCE OF PERSONNEL	83
A9 DETERMINE WORK PRIORITIES	81
A4 COORDINATE JOB REQUIREMENTS WITH OTHER LABORATORIES OR APPROPRIATE AGENCIES	79
A5 COORDINATE MAINTENANCE WORK WITH APPROPRIATE PERSONNEL OR AGENCIES	77
A27 ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	77
B83 INTERPRET POLICIES OR DIRECTIVES FOR SUBORDINATES	77
C92 ANALYZE QUALITY ASSURANCE RESULTS	77
A2 ASSIGN PERSONNEL TO DUTY POSITIONS	74
A40 PLAN OR SCHEDULE WORK PRIORITIES	74
B88 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY TECHNICIANS (AFSC 32470)	74
A46 SCHEDULE PERSONNEL FOR LEAVE OR TEMPORARY DUTY (TDY)	73
A39 PLAN OR SCHEDULE WORK ASSIGNMENTS	72
C127 SELECT PERSONNEL FOR SPECIALIZED TRAINING	72
C91 ANALYZE MAINTENANCE AND INSPECTION REPORTS OR CHARTS	71
D134 ANNOTATE TRAINING RECORDS	71
B87 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY SPECIALISTS (AFSC 32450)	70
C102 EVALUATE PERSONNEL FOR PROMOTION, DEMOTION, OR RECLASSIFICATION	70
A7 DETERMINE LOGISTICS REQUIREMENTS, SUCH AS SPACE, EQUIPMENT, OR PERSONNEL	67
C104 EVALUATE PMEL MAINTENANCE PROCEDURES	67

TABLE V (CONTINUED)

PMEL MANAGERS & LABORATORY CHIEF CLUSTER
(STG38)

GROUP SIZE: 257	AVERAGE TAFMS: 196 MONTHS
PERCENT OF SAMPLE: 13%	AVERAGE TICF: 147 MONTHS
PREDOMINANT PAYGRADES: E7 (5-8)	TYPE PMEL ASSGN: IIB: 56%; II/IV: 11%; N/A: 10%

TASKS	PERCENT MEMBERS PERFORMING
C112 EVALUATE WORK SCHEDULES	67
C114 IDENTIFY ROOT CAUSES FOR QUALITY ASSURANCE (QA) FAILURES	64
C116 INDORSE ENLISTED PERFORMANCE REPORTS (EPR)	64
C101 EVALUATE MAINTENANCE PRODUCTION REPORTS	63
A20 DEVELOP SELF-INSPECTION PROGRAMS	62
A24 DEVELOP WORK METHODS OR CONTROLS	62
D141 DETERMINE TRAINING REQUIREMENTS	61
B67 IDENTIFY ACCEPTABLE SUBSTITUTE EQUIPMENT	59
C108 EVALUATE SELF-INSPECTION PROGRAMS	59
B51 ADJUST DAILY MAINTENANCE PLANS TO MEET OPERATIONAL COMMITMENTS	57
C95 ASSESS ADEQUACY OF ENVIRONMENTAL CONTROL SYSTEMS	57

TABLE VI

PMEL QUALITY ASSURANCE CLUSTER
(STG76)

GROUP SIZE: 38
 PERCENT OF SAMPLE: 2%
 PREDOMINANT PAYGRADES: E5 (4-6)

AVERAGE TAFMS: 116 MONTHS
 AVERAGE TICF: 95 MONTHS
 TYPE PMEL ASSGN: IIB: 71%

TASKS	PERCENT MEMBERS PERFORMING
F333 PERFORM TMDE QUALITY VERIFICATION INSPECTIONS (QVI)	97
F331 PERFORM OVER-THE-SHOULDER OR TASK EVALUATIONS OF PMEL PERSONNEL	95
F327 MONITOR PMEL TECHNICIANS QA SAMPLING LEVEL BY MULTILEVEL CONTINUOUS SAMPLING METHOD	92
F317 INSPECT OUTGOING TMDE FOR DOCUMENTATION ACCURACY, CLEANLINESS, PHYSICAL CONDITION, AND SAFETY	89
F334 PERFORM WORKING STANDARDS CHECKS	89
F312 EVALUATE DRAFT OR COMMERCIAL CALIBRATION PROCEDURES	84
F314 EVALUATE TECHNICAL ORDER IMPROVEMENT REPORTS	84
F316 INITIATE OR COMPLETE AFTO FORMS 442 (TMDE INSPECTION RECORD)	84
F336 WRITE QA REPORTS OR SUMMARIES	84
F309 CONDUCT QUALITY ASSURANCE (QA) BRIEFINGS FOR NEWLY ASSIGNED PERSONNEL	82
F325 MAINTAIN TRUNCATION CHARTS OR LOGS	82
F320 INTERPRET TMDE CALIBRATION PROCEDURES FOR PMEL TECHNICIANS OR OWNING WORKCENTERS (OWC)	79
C106 EVALUATE QUALITY ASSURANCE PROGRAM (QAP) FOR COMPLIANCE WITH QAP REQUIREMENTS	78
C114 IDENTIFY ROOT CAUSES FOR QUALITY ASSURANCE (QA) FAILURES	76
F318 INSPECT PMEL MAINTENANCE ACTIONS	74
F308 CONDUCT ON-SITE PMEL QUALITY ASSURANCE AND MANAGEMENT INSPECTION VISITS	71
F322 MAINTAIN DEFICIENCY REPORTS, SUCH AS MATERIEL, QUALITY, SOFTWARE, AND WARRANTY	71
F310 CONTROL AND ISSUE "K" STAMPS	68
F306 ASSIST SCHEDULER IN PERFORMING INCOMING INSPECTIONS OF TMDE	61
F326 MONITOR PMEL ENVIRONMENT AND FACILITY RESTRICTION LIMITS	56
F335 PLAN OR SCHEDULE ON-SITE PMEL QUALITY ASSURANCE AND MANAGEMENT INSPECTION VISITS	56
B70 IMPLEMENT OR DIRECT QUALITY ASSURANCE PROGRAMS	55
C126 REVIEW TECHNICAL ORDER IMPROVEMENT REPORTS	55

TABLE VI (CONTINUED)

PMEL QUALITY ASSURANCE CLUSTER
(STG76)

GROUP SIZE: 38
 PERCENT OF SAMPLE: 2%
 PREDOMINANT PAYGRADES: E5 (4-6)

AVERAGE TAFMS: 116 MONTHS
 AVERAGE TICF: 95 MONTHS
 TYPE PMEL ASSGN: IIB: 71%

TASKS	PERCENT MEMBERS PERFORMING
F311 EVALUATE DEFICIENCY REPORTS, SUCH AS MATERIEL, QUALITY, SOFTWARE, AND WARRANTY	55
F323 MAINTAIN ENVIRONMENTAL LOGS AND CHARTS	53
E233 INITIATE OR ANNOTATE AF FORMS 2419 (ROUTING AND REVIEW OF QUALITY CONTROL REPORTS)	50
B80 INITIATE SEMIANNUAL OR MONTHLY PMEL REPORTS	47
B87 SUPERVISE PRECISION MEASURING EQUIPMENT LABORATORY SPECIALISTS (AFSC 32450)	47
B67 IDENTIFY ACCEPTABLE SUBSTITUTE EQUIPMENT	45

TABLE VII

PMEL AUTOMATED MANAGEMENT SUBSYSTEM CLUSTER
(STG156)

GROUP SIZE: 20	AVERAGE TAFMS: 135 MONTHS
PERCENT OF SAMPLE: 1%	AVERAGE TICF: 113 MONTHS
PREDOMINANT PAYGRADES: E5 (4-7)	TYPE PMEL ASSGN: IIB: 60%; IIC: 15%; II/IV: 15%

TASKS	PERCENT MEMBERS PERFORMING
H376 ASSIGN PMEL AUTOMATED MANAGEMENT SUBSYSTEM (PAMS) PASSWORDS	100
H377 ASSIGN SPOOLER TASKS TO SPECIFIC PAMS TERMINALS	100
H381 EDIT PAMS USER FILES	100
H382 ESTABLISH PAMS USER FILES	100
H391 PERFORM PAMS DAILY, WEEKLY, OR MONTHLY BACKUPS	100
H395 PRINT PAMS REPORTS	100
H387 LOAD OR UPDATE PAMS PERSONNEL DATA FILES	95
H389 MAINTAIN PAMS TAPE BACKUP LIBRARIES	95
H390 PERFORM OPERATOR MAINTENANCE ON PAMS EQUIPMENT	95
H393 PERFORM RESTORATION OF PAMS DATA FILES	95
H400 WRITE PAMS REPORTS	95
H378 CONDUCT PAMS IN-HOUSE TRAINING	90
H388 MAINTAIN PAMS PASSWORD LOGS	90
H396 PURGE PAMS DATA FILES	90
H385 INSTALL PAMS SOFTWARE REVISIONS	85
H386 INSTALL PAMS SPOOLER FILES	85
H394 PLAN PAMS IN-HOUSE TRAINING	85
H383 INITIATE PAMS PROGRAM CHANGE REQUESTS	80
H398 TRANSFER MAINTENANCE DATA COLLECTION (MDC) TRANSACTION FILES TO MDC SYSTEM	80
H399 UPDATE PAMS PROGRAM FILES	80
E211 DEVELOP OR WRITE COMPUTER PROGRAMS	75
H379 CREATE PAMS PROGRAM FILES	75
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	65
H397 REQUISITION ADDITIONAL PAMS EQUIPMENT	65
H384 INITIATE SERVICE CONTRACTS FOR PAMS	55
H380 DISCHARGE PAMS UNINTERRUPTIBLE POWER SUPPLIES	50
G367 REVIEW AND UPDATE PMEL LISTINGS	35
H392 PERFORM PAMS TRANSPORTABLE FIELD CALIBRATION UNIT (TFCU) DOWNLOADS OR UPLOADS	35
E300 TROUBLESHOOT AUTOMATED MAINTENANCE MANAGEMENT SYSTEM HARDWARE OR SOFTWARE	30

TABLE IX

TECHNICAL ORDER DISTRIBUTION OFFICE IJT
(STG242)

GROUP SIZE: 6
PERCENT OF SAMPLE: .3%
PREDOMINANT PAYGRADES: E-5

AVERAGE TAFMS: 102 MONTHS
AVERAGE TICF: 75 MONTHS
TYPE PMEL ASSGN: IIA: 33%; IIB: 33%;
II/IV: 17%

TASKS		PERCENT MEMBERS PERFORMING
A8	DETERMINE PUBLICATION OR TECHNICAL ORDER REQUIREMENTS	100
E237	INITIATE OR COMPLETE TECHNICAL ORDER LIBRARY FORMS, SUCH AS AFTO FORMS 32, 110, 110A, 110B, 131, AND 187	83
E238	INITIATE OR COMPLETE TECHNICAL ORDER SYSTEM FORMS, SUCH AS AFTO FORMS 22 AND 27	83
E269	MAINTAIN TECHNICAL ORDER LIBRARIES	83
A29	ESTABLISH TECHNICAL ORDER DISTRIBUTION OFFICES (TODO)	67
B61	DIRECT MAINTENANCE OF TECHNICAL ORDER LIBRARIES	67
A28	ESTABLISH PUBLICATION LIBRARIES	50
D134	ANNOTATE TRAINING RECORDS	50
E260	MAINTAIN PUBLICATION LIBRARIES, OTHER THAN TECHNICAL ORDER LIBRARIES	50
E293	RESEARCH TECHNICAL ORDERS	50

TABLE X
 PMEL SCHEDULING IJT
 (STG349)

GROUP SIZE: 8
 PERCENT OF SAMPLE: 1%
 PREDOMINANT PAYGRADES: E-5 (4-7)

AVERAGE TAFMS: 123 MONTHS
 AVERAGE TICF: 91 MONTHS
 TYPE PMEL ASSGN: IIB: 67%

TASKS	PERCENT MEMBERS PERFORMING
G361 PERFORM INCOMING INSPECTIONS OF TMDE	73
G363 PLAN OR SCHEDULE ON-SITE CALIBRATIONS	73
G349 ISSUE HAND RECEIPTS TO OWC FOR INCOMING TMDE	67
G340 ASSIGN TMDE JOB CONTROL NUMBERS	60
G356 MAINTAIN TMDE CALIBRATION (FORECAST) LISTINGS AND SCHEDULES	60
G367 REVIEW AND UPDATE PMEL LISTINGS	60
G375 VERIFY STATUS OF INCOMING TMDE, SUCH AS REQUIRED DOCUMENTATION AND CURRENT DATA	60
G344 COORDINATE MAINTENANCE OF EQUIPMENT WITH APPROPRIATE OWCS	53
G364 PRINT AND DISTRIBUTE TMDE REPORTS OR LISTINGS	53
G355 MAINTAIN MAINTENANCE DATA COLLECTION (MDC) MASTER IDENTIFICATION (ID) LISTINGS	47
G357 MAINTAIN TMDE COORDINATOR CONTROL BOOKS, LOGS, OR APPOINTMENT LETTERS	47
G362 PERFORM PMEL AUTOMATED MANAGEMENT SUBSYSTEM (PAMS) PART	47
G365 PURGE MDC AND MASTER ID DATA FILES	47
G341 CONDUCT DAILY EQUIPMENT STATUS BRIEFINGS	40
G373 VALIDATE STATUS OF EQUIPMENT DURING LABORATORY PROCESSING	27
A27 ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	13

TABLE XI

RADIAC EQUIPMENT MAINTENANCE IJT
(STG555)

GROUP SIZE: 7
 PERCENT OF SAMPLE: .3%
 PREDOMINANT PAYGRADES: E-4 (3-6)

AVERAGE TAFMS: 81 MONTHS
 AVERAGE TICF: 72 MONTHS
 TYPE PMEL ASSGN: IIC: 57%; IIB: 29%

TASKS	PERCENT MEMBERS PERFORMING
E179 ANNOTATE AFTO FORMS 140 (RADIAC EQUIPMENT MAINTENANCE RECORD)	100
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	100
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	100
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	100
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	100
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	100
Q976 ALIGN, TROUBLESHOOT, OR REPAIR SCINTILLATION DETECTORS	100
Q977 CALCULATE BETA AND GAMMA SOURCE INTENSITIES	100
Q979 CALIBRATE GEIGER-MUELLER DETECTORS	100
Q982 CALIBRATE SCINTILLATION DETECTORS	100
I403 CLEAN TMDE USING CHEMICALS	86
Q974 ALIGN, TROUBLESHOOT, OR REPAIR GEIGER-MUELLER DETECTORS	86
Q978 CALIBRATE BETA AND GAMMA SOURCE INTENSITIES	86
Q980 CALIBRATE ION CHAMBER DETECTORS	86
Q981 CALIBRATE PERSONNEL DOSIMETERS	86
Q975 ALIGN, TROUBLESHOOT, OR REPAIR ION CHAMBER DETECTORS	71
Q983 PERFORM LEAK TESTS ON RADIOISOTOPES (SWIPE TEST)	57

EQUIPMENT USED: CAPACITOR, DECADE
 COUNTER, ELECTRONIC
 CURVE TRACER
 DETECTOR, RADIAC
 EQUIPMENT, RADIATION DETECTING
 MULTIMETER, DIGITAL
 OSCILLOSCOPE, DIGITAL
 PROBE, SCOPE
 RESISTOR, DECADE
 SOURCE, ALPHA
 SOURCE, BETA/GAMMA
 STANDARD, DC
 VOLTMETER, DIFFERENTIAL
 VOLTMETER, DIGITAL

APPENDIX B

**SELECTED REPRESENTATIVE TASKS PERFORMED BY
CAREER LADDER SPECIALTY LAB GROUPS**

TABLE I
TYPE IIA PMEL

GROUP SIZE: 112

SKILL LEVEL: 32450

<u>DUTY</u>		<u>TIME SPENT</u>
I	PERFORMING GENERAL PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL) MAINTENANCE TASKS	12.4
K	MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT (K1 AND K2)	11.9
L	MAINTAINING FREQUENCY GENERATING AND MEASURING EQUIPMENT (K3)	11.6
O	MAINTAINING ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT (K5 AND K6)	11.6

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	87
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	84
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	83
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	81
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	81
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	77
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	76
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS	75
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	70
I427 SOLDER OR DESOLDER ESDs	70
I415 INTERPRET CALIBRATION CORRECTION CHARTS OR GRAPHS	68
I406 CLEAN, TREAT, OR REPLACE FILTERS	64
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	60
J438 CALCULATE CURRENT, VOLTAGE, IMPEDANCE, OR POWER PARAMETERS	60
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	58

TABLE II
TYPE IIB PMEL

GROUP SIZE: 686

SKILL LEVEL: 32450

<u>DUTY</u>	<u>TIME SPENT</u>
I PERFORMING GENERAL PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL) MAINTENANCE TASKS	12.6
E PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	12.4
L MAINTAINING FREQUENCY GENERATING AND MEASURING EQUIPMENT (K3)	11.6
M MAINTAINING WAVEFORM ANALYZING EQUIPMENT (K3)	10.0
O MAINTAINING ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT (K5 AND K6)	9.4
K MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT (K1 AND K2)	9.1

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	87
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	86
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	85
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	83
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	83
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS	79
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	79
I415 INTERPRET CALIBRATION CORRECTION CHARTS OR GRAPHS	76
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	75
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	74
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	72
I406 CLEAN, TREAT, OR REPLACE FILTERS	71
I427 SOLDER OR DESOLDER ESDs	69
I422 RECONSTRUCT RUNS OR SOLDERING PADS	62
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	58
J438 CALCULATE CURRENT, VOLTAGE, IMPEDANCE, OR POWER PARAMETERS	58

TABLE III
TYPE IIC PMEL

GROUP SIZE: 95

SKILL LEVEL: 32450

<u>DUTY</u>	<u>TIME SPENT</u>
I PERFORMING GENERAL PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL) MAINTENANCE TASKS	15.9
M MAINTAINING WAVEFORM ANALYZING EQUIPMENT (K3)	13.2
E PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	11.8
K MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT (K1 AND K2)	11.3
L MAINTAINING FREQUENCY GENERATING AND MEASURING EQUIPMENT (K3)	9.7
R MAINTAINING ELECTRICAL MEASUREMENTS CONSOLES AND EQUIPMENT (K8)	7.5
J PERFORMING METROLOGY COMPUTATIONS AND ANALYSES	7.0

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	90
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	88
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	84
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	83
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	82
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	82
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	78
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	78
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	78
I427 SOLDER OR DESOLDER ESDs	76
I415 INTERPRET CALIBRATION CORRECTION CHARTS OR GRAPHS	72
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	69
I406 CLEAN, TREAT, OR REPLACE FILTERS	68
I422 RECONSTRUCT RUNS OR SOLDERING PADS	67
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING PACE SYSTEM	64

TABLE IV
TYPE IV (F15) PMEL

GROUP SIZE: 82

SKILL LEVEL: 32450

<u>DUTY</u>	<u>TIME SPENT</u>
E PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	12.2
M MAINTAINING WAVEFORM ANALYZING EQUIPMENT (K3)	10.9
I PERFORMING GENERAL PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL) MAINTENANCE TASKS	10.8
U MAINTAINING F-15 UNIQUE WEAPONS SYSTEM PRECISION MEASURING EQUIPMENT (PME)	10.8
L MAINTAINING FREQUENCY GENERATING AND MEASURING EQUIPMENT (K3)	9.6
K MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT (K1 AND K2)	9.5
R MAINTAINING ELECTRICAL MEASUREMENTS CONSOLES AND EQUIPMENT (K8)	5.7
T MAINTAINING SPECIAL TEST EQUIPMENT	5.7

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	90
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	89
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	89
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	89
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	85
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	83
L602 CALIBRATE ELECTRONIC COUNTERS	83
K506 CALIBRATE AC/DC ANALOG MULTIMETERS OR ACCESSORIES	81
K472 ALIGN, TROUBLESHOOT, OR REPAIR AC/DC ANALOG MULTIMETERS OR ACCESSORIES	81
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	78
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	77
K507 CALIBRATE AC/DC ANALOG VOLTMETERS	76
M690 CALIBRATE VERTICAL PLUG-IN UNITS	75
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	73

TABLE V
TYPE IV (F16) PMEL

GROUP SIZE: 52

SKILL LEVEL: 32450

<u>DUTY</u>	<u>TIME SPENT</u>
E PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	17.1
V MAINTAINING F-16 UNIQUE WEAPONS SYSTEM PRECISION MEASURING EQUIPMENT (PME)	16.2
I PERFORMING GENERAL PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL) MAINTENANCE TASKS	12.2
O MAINTAINING ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT (K5 AND K6)	8.0
K MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT (K1 AND K2)	7.8
M MAINTAINING WAVEFORM ANALYZING EQUIPMENT (K3)	6.9
T MAINTAINING SPECIAL TEST EQUIPMENT	5.5

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	92
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	86
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	83
E235 INITIATE OR COMPLETE AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	77
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	75
V1282 CALIBRATE SMSs (16U75501-)	73
V1271 ALIGN, TROUBLESHOOT, OR REPAIR STORES MANAGEMENT SYSTEM (SMS) (16U75501-)	73
V1280 CALIBRATE PRELOAD ARMAMENT CIRCUIT TEST SETS (16U75060-)	73
V1269 ALIGN, TROUBLESHOOT, OR REPAIR PRELOAD ARMAMENT CIRCUIT TEST SETS (16U75060-)	73
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	71
V1270 ALIGN, TROUBLESHOOT, OR REPAIR SMS BREAKOUT BOXES (16UE75517-)	69
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	67
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	67

TABLE VI
TYPE II/IV PMEL

GROUP SIZE: 90

SKILL LEVEL: 32450

<u>DUTY</u>	<u>TIME SPENT</u>
I PERFORMING GENERAL PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL) MAINTENANCE TASKS	12.9
L MAINTAINING FREQUENCY GENERATING AND MEASURING EQUIPMENT (K3)	12.3
E PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	11.6
M MAINTAINING WAVEFORM ANALYZING EQUIPMENT (K3)	11.2
O MAINTAINING ELECTROMECHANICAL AND DIMENSIONAL EQUIPMENT (K5 AND K6)	9.4
K MAINTAINING VOLTAGE, CURRENT, AND IMPEDANCE EQUIPMENT (K1 AND K2)	9.3

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
E201 COMPLETE AFTO FORMS 99 OR 398 (LIMITED/SPECIAL TMDE CERTIFICATION)	87
I414 INSPECT, SERVICE, OR REPLACE BATTERIES	86
E202 COMPLETE AFTO FORMS 108 OR 394 (TMDE CERTIFICATION)	81
I426 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS USING SOLDERING IRONS	80
I413 INSPECT OR REPLACE COMMON NONELECTRICAL HARDWARE, SUCH AS KNOBS, HANDLES, SCREWS, NUTS, FEET, OR CASES	80
I429 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING SOLDERING IRONS	80
I412 INSPECT OR REPLACE COMMON ELECTRICAL HARDWARE, SUCH AS POWER PLUGS AND FUSES	78
I425 SOLDER OR DESOLDER DISCRETE (COMMON) CIRCUIT COMPONENTS OR SINGLE LAYER CIRCUIT BOARDS	77
I428 SOLDER OR DESOLDER INTEGRATED CIRCUITS USING PACE SYSTEM	77
I427 SOLDER OR DESOLDER ESDs	76
I416 PERFORM CALCULATIONS USING SCIENTIFIC CALCULATORS	76
I415 INTERPRET CALIBRATION CORRECTION CHARTS OR GRAPHS	73
E199 COMPLETE AF FORMS 2005 (ISSUE/TURN IN REQUEST)	70