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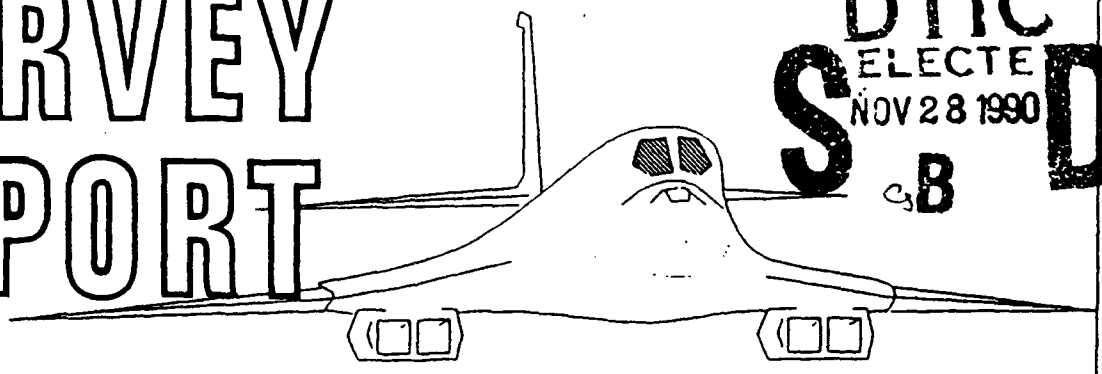
UNITED STATES AIR FORCE

OCCUPATIONAL SURVEY REPORT



B-1B AVIONICS TEST STATION
AND COMPONENTS SPECIALTY

AFSC 451X7

AFPT 90-451-872

OCTOBER 1990

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

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PREFACE

This report presents the results of an Air Force Occupational Survey of the B-1B Avionics Test Station and Components (AFSC 451X7) career ladder. Authority for conducting occupational surveys is contained in AFR 35-2. Computer products used in this report are available for use by operations and training officials.

Mr Roberto Salinas developed the survey instrument, Mr Wayne Fruge provided computer programming support, and Ms Tamme Lambert provided administrative support. Captain Ron W. Schrupp analyzed the data and wrote the final report. This report has been reviewed and approved for release by Lieutenant Colonel Charles D. Gorman, Chief, Airman Analysis Branch, Occupational Analysis Division, USAF Occupational Measurement Center.

Copies of this report are distributed to Air Staff sections, major command personnel, and other interested training and management personnel. Additional copies may be requested from the Occupational Measurement Center, Attention: Chief, Occupational Analysis Division (OMY), Randolph AFB, Texas 78150-5000.

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SUMMARY OF RESULTS

1. Survey Coverage: Survey results are based on responses from 216 B-1B Avionics Test Station and Components personnel. This represents 69 percent of the total assigned AFSC 451X7 population. Incumbents were surveyed across Strategic Air Command (SAC) and Air Training Command (ATC), including personnel from the 3-, 5-, and 7-skill level DAFSCs.

2. Career Ladder Structure: Three clusters containing five job variations and one independent job were identified in the career ladder structure analysis. One cluster involves maintaining automatic test station (ATS) equipment. A second cluster performs manual test station (MTS) equipment maintenance and contains a group of technicians and a shift supervisor group. The third cluster is primarily supervisory, where personnel work as shift/production supervisors or shop chiefs. Personnel assigned to Lowry AFB as training instructors comprise the independent job.

3. Career Ladder Progression: The 3- and 5-skill level personnel essentially perform maintenance functions, while the 7-skill level members are both maintenance workers and supervisors. Career ladder progression for AFSC 451X7 personnel is clearly distinct as members advance from the 5- to the 7-skill level.

4. AFR 39-1 Specialty Descriptions: When survey data were compared to AFR 39-1 Specialty Descriptions for AFSC 451X7 personnel, the documents were found to accurately reflect the way personnel were being utilized in the field. For both the 3-/5-skill and 7-skill level descriptions, a recommendation was made to add a reference to "core automated maintenance system (CAMS)" functions. Also, it was suggested that "line replaceable units (LRU)" be added to each area under the DUTIES AND RESPONSIBILITIES section of the 7-skill level description.

5. Training Analysis: A match of survey data to the AFSC 451X7 Specialty Training Standard (STS) offered limited support for many STS items. There were also many STS 3-skill level proficiency codes identified for possible changes. Similarly, a match of data to the Plan of Instruction (POI) for Course G3ABR45137 000 (conducted at Lowry AFB CO) revealed several unsupported POI objectives. There were also several tasks not matched to the STS and POI which reflect training areas that may deserve inclusion in future revisions of these documents. Electronic Principles data covering the 45157 DAFSC personnel may be useful for determining which electronics fundamentals are most valuable for 451X7 first-enlistment personnel to know.

6. Job Satisfaction: Overall, the survey sample respondents reflected good job satisfaction. The 'reenlistment intentions' indicator for first-enlistment members was slightly low, as were the 'sense of accomplishment' indicators for the 49-96 month and 97+ month TAFMS groups. But, considering the favorable responses shown across the other indicators for these TAFMS

groups, there is no apparent cause for concern. Compared to other mission equipment maintenance specialties surveyed in 1989, the 451X7 personnel had slightly lower indicators, though the overall trends are high. Indicators for the specialty jobs reflected good satisfaction as well, particularly for the more experienced supervisory groups.

7. Implications: The Rivet Workforce initiative, which created AFSC 451X7 in 1987, has allowed personnel from a variety of Air Force specialties to integrate their various skills with some success. The Specialty Training Standard, Plan of Instruction, and Specialty Descriptions which were developed provide a good starting point for future training. Recommendations were made to change portions of these documents, but the training appears to be on track. Job satisfaction is good for the 451X7 career ladder in general, but a few satisfaction indicators may deserve further evaluation.

OCCUPATIONAL SURVEY REPORT
B-1B AVIONICS TEST STATION AND COMPONENTS CAREER LADDER
(AFSC 451X7)

INTRODUCTION

This report presents the results of an occupational survey of the B-1B Avionics Test Station and Components specialty completed by the Occupational Analysis Division, USAF Occupational Measurement Center, in September 1990. This survey was requested by HQ ATC/TTOA, Randolph AFB TX, in August 1988. The purpose of this survey is to evaluate the AFSC 451X7 career ladder since its creation under a Rivet Workforce initiative, effective 31 October 1987. Career ladder documents, including the Specialty Training Standard (STS) and AFR 39-1 Specialty Descriptions, have not been validated before with occupational survey data. These documents, along with the Plan of Instruction (POI) used by technical training personnel at Lowry AFB CO, will be examined in this report.

Background

The 451X7 career ladder was created in October 1987 to provide aircraft maintenance for the newly developed B-1B bomber. Personnel from a variety of avionics, flight control, and aircraft computer systems specialties, were brought together under the Rivet Workforce initiative to meet maintenance requirements for the B-1B. Training and classification documents were developed, along with a formal training school established at Lowry AFB CO. Occupational survey data can be helpful in determining whether the training program is meeting the needs of the AFSC 451X7 personnel assigned to SAC.

According to the AFR 39-1 Specialty Descriptions for AFSC 451X7, dated 1 February 1988, B-1B Avionics Test Station and Components Specialists are responsible for operating, calibrating, programming, troubleshooting, modifying, and repairing automatic and manual test equipment, consoles, and systems components found on the B-1B bomber. Some of these specialists also perform administrative and supervisory activities. For members entering the 451X7 career ladder, a minimum score of 67 is required on the Armed Services Vocational Aptitude Battery (ASVAB) test, in the electronics category.

Currently, entry-level AFSC 451X7 personnel are required to complete Course G3ABR45137 000 located at Lowry AFB CO. This course comprises 199 academic days (39 weeks overall), which includes instruction on electronic fundamentals, troubleshooting procedures, ATLAS software language, digital (DIG) test station, digital analog video (DAV) test station, radio frequency (RF) test station, and associated line replaceable units (LRU). Once members reach their 5-skill level, they must complete Course E3AZR45157 000, Manual

Test Stations, which is conducted at Keesler AFB MS. This is a 48-day course covering diagram analysis and maintenance procedures for the AN/ASC-19 terminal, AN/ARC-190 radio, and TACAN systems. The training portion of this report will provide data useful for evaluating the AFSC 451X7 STS dated October 1987 (with change November 1989), and the POI for the basic training course. The POI is dated 15 November 1989.

SURVEY METHODOLOGY

Data for this survey were collected using USAF Job Inventory AFPT 90-451-872, dated May 1989. The inventory developer reviewed pertinent career ladder documents, the previous inventory, and OSR to prepare a tentative task list. This task list was then validated through personal interviews with 17 subject-matter experts in operational units at the following 5 bases:

BASE	UNIT	REASON FOR VISIT
Lowry AFB	3450 TTG	Tech School Location
Dyess AFB	96 AMS	First B-1B Operating Unit
McConnell AFB	384 AMS	Operational Unit
Ellsworth AFB	28 AMS	Largest B-1B Wing
Keesler AFB	3380 TTG	School Location for Course E3AZR45157 000, Manual Test Station

The resulting inventory lists 1,157 tasks grouped into 24 duty headings. The inventory also contains a number of background questions relating to duty AFSC (DAFSC), time in present job, time in service, job title, work area assigned, equipment used, previous AFS held, and job satisfaction information.

Survey Administration

From July 1989 through February 1990, the inventory booklets were administered to personnel eligible to take the survey. Consolidated Base Personnel Offices located at eight operational bases within the continental United States (CONUS) administered the inventory booklets to 451X7 personnel holding 3-, 5-, or 7-skill level DAFSCs. These respondents were selected from a computer-generated mailing list provided by the Air Force Human Resources Laboratory. Those individuals not eligible to participate in the survey included members in transition for a permanent change of station (PCS), those retiring at the time of survey, those hospitalized, and those who had not been in their present job for at least 6 weeks.

All individuals who filled out an inventory booklet first completed an identification and background information section. Next, they went through the booklet and checked each task performed in their current job. After checking all tasks performed, the respondents rated each of these tasks on a 9-point scale reflecting relative time spent on each task compared to all other tasks. Ratings ranged from 1 (indicating a very small amount of time spent) to 9 (indicating a very large amount of time spent). To determine relative time spent for each task checked by a respondent, the sum of a respondent's ratings was assumed to account for 100 percent of his or her time spent on the job. All respondent's ratings were added together, and then each rating was divided by the sum of all responses. Then, this quotient was multiplied by 100 to obtain the relative percent time spent for each task. This procedure provided a basis for comparing tasks, not only in terms of percent members performing, but also in terms of relative percent time spent on tasks and groups of tasks.

Survey Sample

Participants in the survey were carefully chosen to ensure that the final survey sample would be proportionally representative of the assigned major command (MAJCOM) and paygrade groups. Table 1 shows the percentage distribution, by MAJCOM, of assigned personnel in the career ladder as of July 1989. Also shown in this table is the percentage distribution, by MAJCOM, in the final survey sample. Table 2 shows the survey sample representation across paygrades. As these tables indicate, survey representation by MAJCOM was generally good. The 216 respondents included in the final survey sample represent 69 percent of the total 313 DAFSC 451X7 personnel assigned.

Task Factor Administration

Once the survey data were processed and input into a Sperry 1100 computer, Comprehensive Occupational Data Analysis Programs (CODAP) were used to analyze the data and create job descriptions for various groupings of respondents. But, job descriptions alone do not provide sufficient information for making decisions about career ladder documents or training programs. Task Difficulty (TD) and Training Emphasis (TE) data can be useful for analysis of the career ladder. To obtain the needed task factor data, senior AFSC 451X7 personnel (mostly those in paygrades E-6 and E-7) were asked to complete TD and TE booklets. All of these booklets were processed separately from the job inventories, and some compiled data are used in a number of different analyses discussed later in this report.

Task Difficulty (TD). Task difficulty is defined as the length of time the average airman takes to learn how to perform a task. This survey had 50 experienced supervisors rate the difficulty of the tasks in the inventory on a 9-point scale ranging from 1 (extremely low difficulty) to 9 (extremely high difficulty). Ratings were adjusted so tasks of average difficulty would have

TABLE 1

COMMAND REPRESENTATION OF AFSC 451X7 SURVEY SAMPLE

COMMAND	PERCENT OF ASSIGNED*	PERCENT OF SAMPLE
SAC	85	92
ATC	14	7
AFSC	1	1

TOTAL ASSIGNED*	313
TOTAL NUMBER ELIGIBLE	281
TOTAL IN SAMPLE	216
PERCENT OF ASSIGNED	69%
PERCENT OF ELIGIBLE	77%

* As of July 1989

Note: AFSC 451X7 personnel not eligible for survey include those members with discharge, retirement, PCS, or hospital status, and those having less than 6 weeks in their present job.

TABLE 2

PAYGRADE REPRESENTATION OF AFSC 451X7 SURVEY SAMPLE

PAYGRADE	PERCENT OF ASSIGNED*	PERCENT OF SAMPLE
E9	-	-
E8	-	-
E7	5	5
E6	16	16
E5	25	27
E4	17	22
E3	30	30
E2	4	-
E1	3	-

* As of July 1989
- Indicates less than 1 percent

a value of 5.0 and a standard deviation of 1.0. Tasks with ratings of 6.00 and higher are considered difficult for first-term airmen to learn how to perform, thus requiring more time for instruction. If the raters were to agree perfectly on which tasks were most difficult for first-term members to learn, the interrater reliability (as assessed through components of variance of standard group means) for these raters would be 1.0. The interrater reliability for these TD raters was .89, indicating fair agreement was reached on those tasks determined most difficult to learn.

When TD ratings are used with other information, such as percent members performing tasks, they can provide insight into training requirements and help validate the need for structured training for the career ladder.

Training Emphasis (TE). Training emphasis is defined as the amount of structured training that first-enlistment personnel need to perform tasks successfully. Structured training is defined as training provided by resident technical schools, field training detachments (FTD), mobile training teams (MTT), formal OJT, or any other organized training method. Forty-seven experienced AFSC 451X7 supervisors rated the tasks in the inventory on a 10-point scale ranging from 0 (no training emphasis required) to 9 (high training emphasis required). Interrater agreement for these 47 raters was not acceptable, due to differing perceptions among the raters on which inventory tasks should be emphasized in first-term training. For this reason, TE data for this survey will not be reported and cannot be used for analysis of career ladder training.

SPECIALTY JOBS
(Career Ladder Structure)

The structure of jobs within the B-1B Avionics Test Station and Components career ladder was examined on the basis of similarity of tasks performed and the percent of time spent ratings provided by job incumbents, independent of background or other factors.

For the purpose of organizing individual jobs into similar units of work, an automated job clustering program compares the job description for each individual in the sample to every other job description in terms of the tasks performed and the relative amount of time spent doing those tasks. The automated program is designed to find the two most similar job descriptions and merge them into a group. All other job descriptions are then compared to this group, and those that are similar are also merged. In successive stages, new members are added to merge with groups already formed or to create new groups, until all job incumbents (and their respective job descriptions) are merged. The result is a pattern of jobs making up the 451X7 career ladder.

For this report, the career ladder structure is described in terms of clusters, job types, and independent job types. The basic identifying group is the Job Type. A job type is a group of individuals who perform many of the same tasks and spend similar amounts of time performing them. When different

job types have a substantial degree of similarity between them, they are grouped together and labeled a cluster. In many career ladders, there are specialized job types that are too dissimilar to be grouped into any cluster. These unique groups are called independent job types (IJT).

Structure Overview

Based on the similarity of tasks performed and the amount of time spent performing each task, three clusters containing four job types and one IJT were identified in the examination of this specialty. These primary jobs, listed below, are illustrated in Figure 1, and descriptions for each are provided on the following pages. The stage (ST) numbers printed beside each job title are the same numerical identifiers located on the CODAP-diagram. These identifiers are used during analysis of the groups to find specific information for each group. The letter "N" within parenthesis refers to the number of personnel in the group.

I. AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER (ST0017, N=111)

II. MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER (ST0015, N=48)

- A. MTS Technicians (ST0055, N=23)
- B. MTS Shift Supervisors (ST0108, N=17)

III. SUPERVISORY CLUSTER (ST0021, N=24)

- A. Shift/Production Supervisors (ST0042, N=8)
- B. Shop Chiefs (ST0050, N=11)

IV. TRAINING INSTRUCTOR IJT (ST0022, N=13)

V. NOT GROUPED (N=20)

The AFSC 451X7 personnel forming these clusters and IJT account for approximately 90 percent of the total survey sample. The other 10 percent (20 people), referred to as isolates, perform sets of tasks that differ from those tasks performed by the identified groups shown. Therefore, these 20 individuals could not be merged with any identifiable job.

Two tables in this section provide background information about the clusters and independent job type listed. Table 3 displays selected background information, such as DAFSC distributions across each group, average months in service (i.e. TAFMS), average number of tasks performed, and percent of group members supervising. As an example, the Automatic Test Station (ATS) Maintenance Cluster, as shown in Table 3, is composed primarily of 5-skill level personnel (58 percent), who have an average 57 months TAFMS. This group performs an average 166 tasks, and 34 percent are supervisors. The data in

AFSC 451X7
SPECIALTY JOBS
(N= 216)

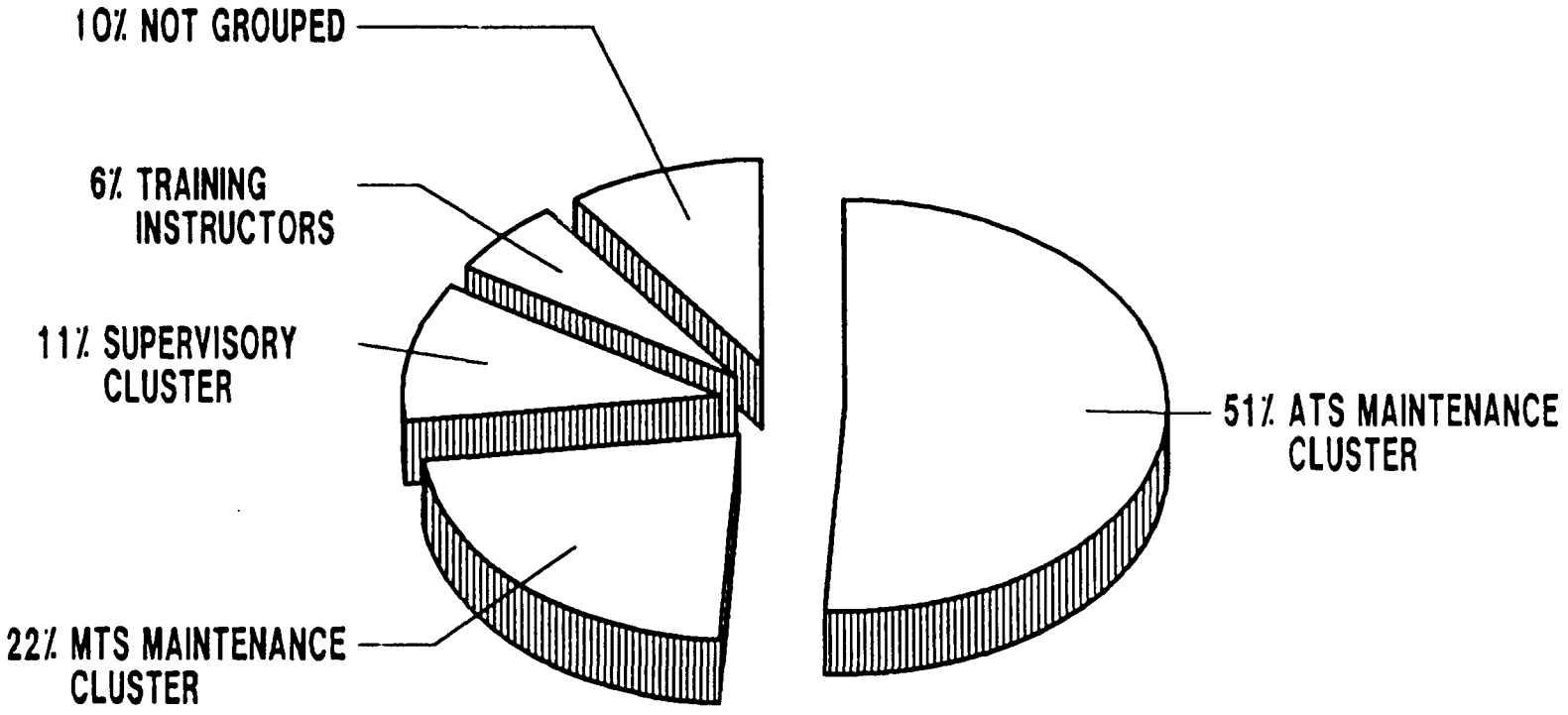

Figure 1

TABLE 3

SELECTED BACKGROUND DATA FOR 451X7 CAREER LADDER JOBS

	AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER	MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER	JOB TYPES	
			MTS TECHNICIANS	SHIFT SUPERVISORS
NUMBER IN GROUP	111	48	23	17
PERCENT OF TOTAL SAMPLE	51%	22%	11%	8%
AFSC DISTRIBUTION (PERCENT RESPONDING)				
45137	24%	6%	9%	0%
45157	58%	65%	70%	53%
45177	18%	29%	21%	47%
PREDOMINANT GRADE(S)	E3	E4	E3-E4	E5
AVERAGE MONTHS IN CAREER LADDER	26	29	25	36
AVERAGE MONTHS IN SERVICE	57	76	51	119
PERCENT IN FIRST ENLISTMENT	58%	43%	69%	6%
AVERAGE NUMBER OF TASKS PERFORMED	166	121	97	189
PERCENT SUPERVISING	34%	48%	22%	100%

TABLE 3 (CONTINUED)

SELECTED BACKGROUND DATA FOR 451X7 CAREER LADDER JOBS

	JOB TYPES			
	SUPERVISORY CLUSTER	SHIFT/PRODUCTION SUPERVISORS	SHOP CHIEFS	TRAINING INSTRUCTOR IJT
NUMBER IN GROUP	24	8	11	13
PERCENT OF TOTAL SAMPLE	11%	4%	5%	6%
DAFSC DISTRIBUTION (PERCENT RESPONDING)				
45137	0%	0%	0%	0%
45157	8%	12%	0%	54%
45177	92%	88%	100%	46%
PREDOMINANT GRADE(S)	E6	E5-E7	E6-E7	E5
AVERAGE MONTHS IN CAREER LADDER	37	35	40	35
AVERAGE MONTHS IN SERVICE	163	122	189	125
PERCENT IN FIRST ENLISTMENT	0%	0%	0%	8%
AVERAGE NUMBER OF TASKS PERFORMED	124	192	109	39
PERCENT SUPERVISING	100%	100%	100%	31%

Table 4 reflects the relative amount of time spent across each of the 24 duties for the identified survey groups. For example, the ATS Maintenance Cluster personnel spend about 31 percent of their job time maintaining digital analog video (DAV) LRUs and TPSs (Duty P), while only 6 percent of their time involves maintaining digital (DIG) test stations and equipment (Duty I).

Also included in this report is an Appendix concerning the various 451X7 job tasks. Appendix A lists tasks commonly performed by members in each of the jobs identified. The most commonly performed tasks are selected according to high percent members performing and time spent data, though the time spent values have been omitted from the appendix. Complete job descriptions for this survey, which include time spent values, can be found in a copy of the Analysis Extract.

Job Descriptions

I. AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER (ST0017, N=111). The 111 members of this cluster account for 51 percent of the survey sample. Their primary job involves maintaining DAV and DIG test stations and associated support equipment. Some of their job includes performing core automated maintenance system (CAMS) functions, forms administration, and general avionics shop tasks (see Table 4). Members of this cluster work exclusively in ATS shops, where most are either Team Leaders or Team Specialists. Fifty-eight percent of the cluster is comprised of 5-skill level members (see Table 3), over half (58 percent) are in their first enlistment, and the group performs an average 166 tasks. Some tasks commonly performed by members in this cluster include:

Perform core automated maintenance system (CAMS) functions
Inspect test equipment
Perform diagnostic test of DAV test stations
Make entries on AFTO Forms 350 (Reparable Item Processing Tag)
Make entries on AFTO Forms 2005 (Issue/Turn in Request)
Troubleshoot DAV test stations
Troubleshoot DIG test stations
Align DAV test stations
Align DIG test stations
Repair avionics computer controls
Operationally check tracking handles

Personnel in this cluster average 57 months TAFMS, most have an E3 paygrade, and 34 percent indicate they are supervisors.

II. MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER (ST0015, N=48). Members in this job spend a majority of their time maintaining communication systems and navigation systems (see Table 4). They also spend time (21 percent) doing administration and supply tasks. Approximately 8 percent of their job time involves maintenance of manual support equipment. These 48

TABLE 4

AVERAGE PERCENT TIME SPENT ON DUTIES BY CAREER LADDER JOBS*

DUTIES	AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER	MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER	JOB TYPES	
			MTS TECHNICIANS	SHIFT SUPERVISORS
A. ORGANIZING AND PLANNING	1	3	2	6
B. DIRECTING AND IMPLEMENTING	2	3	2	6
C. EVALUATING AND INSPECTING	1	2	1	4
D. TRAINING	2	3	1	5
E. PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	14	21	19	18
F. PERFORMING GENERAL AVIONICS SHOP TASKS	12	11	11	6
G. MAINTAINING STRATEGIC MISSION DATA PREPARATION SYSTEMS (SMDPS)	1	2	1	3
H. MAINTAINING CENTRAL INTEGRATED TEST SYSTEM GROUND PROCESSORS (CGP)	1	1	-	2
I. MAINTAINING DIGITAL (DIG) TEST STATIONS AND EQUIPMENT	6	-	-	-
J. MAINTAINING DIGITAL ANALOG VIDEO (DAV) TEST STATIONS AND EQUIPMENT	7	-	-	-
K. MAINTAINING RADIO FREQUENCY (RF) TEST STATIONS AND EQUIPMENT	2	-	0	-
L. MAINTAINING RADAR ELECTRONIC WARFARE (REW) TEST STATIONS AND EQUIPMENT	3	-	-	-

* Columns may not add to 100 percent due to rounding
- Indicates less than 1 percent

TABLE 4 (CONTINUED)

AVERAGE PERCENT TIME SPENT ON DUTIES BY CAREER LADDER JOBS*

DUTIES	AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER	MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER	JOB TYPES	
			MTS TECHNICIANS	SHIFT SUPERVISORS
M. MAINTAINING ANALOG/DIGITAL TEST STATIONS (ADIT II) AND EQUIPMENT	-	-	0	-
N. MAINTAINING TRANSFER MODULE SERVICE SETS (TMSS) AND EQUIPMENT	-	-	0	-
O. MAINTAINING DIGITAL (DIG) LRUs AND TEST PROGRAM SETS (TPS)	18	-	0	-
P. MAINTAINING DIGITAL ANALOG VIDEO (DAV) LRUs AND TPSs	31	0	0	0
Q. MAINTAINING RADIO FREQUENCY (RF) LRUs AND TPSs	-	0	0	0
R. MAINTAINING RADAR ELECTRONIC WARFARE (REW) LRUs AND TPSs	-	0	0	0
S. MAINTAINING ANALOG/DIGITAL TEST STATION (ADIT II) LRUs AND TEST PROGRAM SETS (TPS)	0	1	2	0
T. MAINTAINING TRANSFER MODULE SERVICE SET (TMSS) LRUS AND TEST PROGRAM SETS (TPS)	0	0	0	0
U. MAINTAINING COMMUNICATION SYSTEMS	-	25	28	27
V. MAINTAINING NAVIGATION SYSTEMS	-	20	24	15
W. MAINTAINING TEST BRANCH PANELS	0	-	-	0
X. MAINTAINING MANUAL SUPPORT EQUIPMENT	-	8	9	8

* Columns may not add to 100 percent due to rounding
- Indicates less than 1 percent

TABLE 4 (CONTINUED)

AVERAGE PERCENT TIME SPENT ON DUTIES BY CAREER LADDER JOBS*

DUTIES	JOB TYPES			
	SUPERVISORY CLUSTER	SHIFT/PRODUCTION SUPERVISORS	SHOP CHIEFS	TRAINING INSTRUCTOR IJT
A. ORGANIZING AND PLANNING	14	8	19	5
B. DIRECTING AND IMPLEMENTING	17	11	20	6
C. EVALUATING AND INSPECTING	13	8	18	2
D. TRAINING	11	9	14	42
E. PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	25	18	20	9
F. PERFORMING GENERAL AVIONICS SHOP TASKS	7	12	5	11
G. MAINTAINING STRATEGIC MISSION DATA PREPARATION SYSTEMS (SMDPS)	-	1	-	0
H. MAINTAINING CENTRAL INTEGRATED TEST SYSTEM GROUND PROCESSORS (CGP)	1	2	-	0
I. MAINTAINING DIGITAL (DIG) TEST STATIONS AND EQUIPMENT	1	3	-	7
J. MAINTAINING DIGITAL ANALOG VIDEO (DAV) TEST STATIONS AND EQUIPMENT	2	5	-	9
K. MAINTAINING RADIO FREQUENCY (RF) TEST STATIONS AND EQUIPMENT	1	4	0	7
L. MAINTAINING RADAR ELECTRONIC WARFARE (REW) TEST STATIONS AND EQUIPMENT	2	6	0	1

* Columns may not add to 100 percent due to rounding
- Indicates less than 1 percent

TABLE 4 (CONTINUED)

AVERAGE PERCENT TIME SPENT ON DUTIES BY CAREER LADDER JOBS*

DUTIES	JOB TYPES			
	SUPERVISORY CLUSTER	SHIFT/PRODUCTION SUPERVISORS	SHOP CHIEFS	TRAINING INSTRUCTOR IJT
M. MAINTAINING ANALOG/DIGITAL TEST STATIONS (ADIT II) AND EQUIPMENT	0	0	0	0
N. MAINTAINING TRANSFER MODULE SERVICE SETS (TMSS) AND EQUIPMENT	0	0	0	0
O. MAINTAINING DIGITAL (DIG) LRUs AND TEST PROGRAM SETS (TPS)	2	6	0	0
P. MAINTAINING DIGITAL ANALOG VIDEO (DAV) LRUs AND TPSs	3	9	0	1
Q. MAINTAINING RADIO FREQUENCY (RF) LRUs AND TPSs	0	0	0	0
R. MAINTAINING RADAR ELECTRONIC WARFARE (REW) LRUs AND TPSs	0	0	0	0
S. MAINTAINING ANALOG/DIGITAL TEST STATION (ADIT II) LRUS AND TEST PROGRAM SETS (TPS)	0	0	0	0
T. MAINTAINING TRANSFER MODULE SERVICE SET (TMSS) LRUS AND TEST PROGRAM SETS (TPS)	0	0	0	0
U. MAINTAINING COMMUNICATION SYSTEMS	1	0	2	0
V. MAINTAINING NAVIGATION SYSTEMS	-	0	-	0
W. MAINTAINING TEST BRANCH PANELS	0	0	0	0
X. MAINTAINING MANUAL SUPPORT EQUIPMENT	-	0	-	0

* Columns may not add to 100 percent due to rounding
- Indicates less than 1 percent

members work exclusively in MTS shops acting as Team Specialists, Team Leaders, or Shift Supervisors. As shown in Table 3, about 65 percent of group members hold the 5-skill level, 43 percent are in their first enlistment, and they perform an average 121 tasks in their jobs. Example tasks performed by these specialists include:

Perform core automated maintenance system (CAMS) functions
Inspect test equipment
Operationally check AN/ARC-190 UHF receiver-transmitters
Repair AN/ARC-190 receiver-transmitters
Inventory tools, such as consolidated tool kits (CTK)
Perform corrosion control inspections
Operationally check AN/ARC-190 UHF set controls
Operationally check AN/APN-230 doppler receiver-transmitters
Operationally check AN/ARN-118 TACAN receiver-transmitters
Process DIFM items
Repair AN/ARC-190 UHF antenna couplers

Within this maintenance cluster, there are two job variations. The MTS Technicians (ST0055, N=23) are mostly 5-skill level personnel holding E3 or E4 paygrades. As Table 4 reflects, they spend most of their time on communication and navigation systems maintenance and some manual support equipment maintenance (9 percent). Table 3 indicates these 23 members average 51 months TAFMS and perform 97 tasks on average. Only five group members (22 percent) are supervisors. The MTS Shift Supervisors (ST0108, N=17) comprise the other job in this cluster. These 17 supervisors still perform a highly technical job, but they spend more time performing supervisory duties (A thru D) and less time on general avionics and navigation systems maintenance tasks (see Table 4). Table 3 indicates 47 percent of the group hold 7-skill levels. The group members average 119 months TAFMS, and they perform 189 tasks on average, twice as many as the MTS Technicians.

III. SUPERVISORY CLUSTER (ST0021, N=24). The 24 members of this cluster are career ladder supervisors, spending up to 80 percent of their job time performing supervisory or administrative tasks (Duties A thru E). Data in Table 3 show 92 percent of the group members are 7-skill level supervisors holding E6 paygrades and averaging 163 months TAFMS. The group performs an average 124 tasks, some of which are displayed here:

Perform core automated maintenance system (CAMS) functions
Write APRs
Determine work priorities
Supervise B-1B Avionics Test Station and Component Technicians (AFSC 45177)
Evaluate progress of trainees
Assign maintenance and repair work
Interpret policies, directives, or procedures for subordinates

Verify mission capability (MICAP) conditions
Analyze workload requirements
Counsel personnel
Compile data for reports or requisitions
Inspect shop maintenance actions

Within this supervisory cluster, there are two job variations. The Shift/Production Supervisors (ST0042, N=8) are 5- and 7-skill level personnel holding E5 or E7 paygrades, respectively. They are mostly supervising, but as Table 4 reflects, some of their job involves maintenance of DIG and DAV equipment and associated LRUs (Duties I, J, O, and P). Table 3 indicates the group averages 122 months TAFMS and performs 192 tasks on average. These eight individuals work only in ATS shops. The Shop Chiefs (ST0050, N=11) comprise the other job in this cluster. These 11 individuals perform more purely supervisory roles compared to the other supervisory group, as they spend over 90 percent of their time performing supervisory duties (A thru E). A small portion of their job time includes general avionics tasks (Duty F). As shown in Table 3, all of these members are 7-skill level personnel having an average 189 months TAFMS (over 5 years longer than the Shift/Production Supervisors). They perform 109 tasks on average, about half the number of tasks performed by the other supervisory group. These highly experienced 451X7 personnel are located in ATS and MTS shops.

IV. TRAINING INSTRUCTOR IJT (ST0022, N=13). These 13 members comprise the last job identified in the career ladder structure analysis. They perform an average 39 tasks, less than any other identified job. Their primary job (42 percent) involves performing training tasks (Duty D) at the Lowry AFB Technical Training Center (TTC). Table 4 also indicates some of their time involves general avionics tasks (Duty F) and maintenance of DIG, DAV, and radio frequency (RF) test stations and equipment (Duties I, J, and K, respectively). Data in Table 3 indicate these 5- and 7-skill level personnel hold E5 paygrades, 31 percent are acting supervisors, and they average 125 months TAFMS. Tasks commonly performed by this group include:

Conduct resident course classroom training
Administer tests
Score tests
Develop resident course training materials
Write test questions
Develop performance tests
Evaluate progress of trainees
Perform confidence test of DAV test stations
Perform confidence test of RF test stations
Perform diagnostic test of DAV test stations

As displayed in Table 3, these instructors comprise 6 percent of the total survey sample.

Summary of Specialty Jobs

Three clusters (comprising five jobs) and one independent job type were identified in the AFSC 451X7 career ladder structure analysis. One cluster had a large group of automatic test station maintenance personnel working exclusively on ATS equipment, including DIG and DAV test stations and associated LRUs. A portion of their job also includes performance of general avionics and administrative tasks. Another cluster contained two jobs involved with maintaining manual test stations equipment, such as communication and navigation systems. One of these jobs was primarily technical, while the other involved a combination of technical and supervisory task performance. A third identified cluster had two supervisory jobs, one involving mostly production or shift supervision of ATS shops, while the other more senior supervisors were divided equally among ATS and MTS shops. The independent job contained 13 training instructors assigned to the technical training center at Lowry AFB CO. Their primary function is to conduct resident course training for newly assigned 451X7 members.

ANALYSIS OF DAFSC GROUPS

An analysis of DAFSC groups, in conjunction with the analysis of the career ladder structure, is an important part of each occupational survey. DAFSC analysis identifies similarities and differences in task and duty performance at the various skill levels. This information may then be used to evaluate how well career ladder documents, such as AFR 39-1 Specialty Descriptions and the Specialty Training Standard (STS), reflect what career ladder personnel are actually doing in the field.

Comparisons of the duties and tasks performed across DAFSCs 45137 and 45157 revealed only slight differences between the two skill levels. The 3-skill level job involves more time spent performing general avionics tasks (Duty F) and maintenance on DAV equipment (Duty P), but the 5-skill level members also perform these functions. In contrast, a select group of 5-skill level members are more involved in manual test station maintenance and supervising or training. These differences however, are only slight and therefore considered to be negligible. For this reason, the 3- and 5-skill level members are combined in this report for comparison with the 7-skill level group.

Table 5 of this report displays the distribution of DAFSC group members across career ladder jobs. As this table indicates, the 141 members of the 3-/5-skill level group cover the spectrum of career ladder jobs, with 89 percent of the group found in either the ATS cluster or the MTS cluster. Only 1 percent of this group is part of the supervisory cluster. This compares to 30 percent of the 7-skill level group. A portion of the 7-skill level members are also found in the ATS cluster (27 percent) and the MTS cluster (19 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

TABLE 5

DISTRIBUTION OF DAFSC GROUP MEMBERS ACROSS CAREER LADDER JOB GROUPS
(AS A PERCENTAGE OF DAFSC GROUPS)*

JOB GROUPS	DAFSC 45137/ 45157 (N=141)	DAFSC 45177 (N=74)
I. AUTOMATIC TEST STATION (ATS) MAINTENANCE (N=111) CLUSTER	65	27
II. MANUAL TEST STATION (MTS) MAINTENANCE (N=48) CLUSTER	24	19
A. MTS TECHNICIANS (N=23)	(13)	(7)
B. MTS SHIFT SUPERVISORS (N=17)	(6)	(11)
III. SUPERVISORY CLUSTER (N=24)	1	30
A. SHIFT/PRODUCTION SUPERVISORS (N=8)	(1)	(10)
B. SHOP CHIEFS (N=11)	(0)	(15)
IV. TRAINING INSTRUCTOR IJT (N=13)	5	8
V. NOT GROUPED (N=20)**	5	16

* Columns may not add to 100 percent due to rounding
** Those incumbents whose jobs differ from the identified specialty jobs
() Indicates a group within a cluster

TABLE 6

AVERAGE PERCENT TIME SPENT ON DUTIES BY DAFSC GROUPS*

DUTIES	DAFSC 45137/ 45157 (N=141)	DAFSC 45177 (N=74)
A. ORGANIZING AND PLANNING	1	10
B. DIRECTING AND IMPLEMENTING	2	9
C. EVALUATING AND INSPECTING	1	9
D. TRAINING	4	11
E. PERFORMING GENERAL ADMINISTRATIVE AND SUPPLY TASKS	16	18
F. PERFORMING GENERAL AVIONICS SHOP TASKS	13	10
G. MAINTAINING STRATEGIC MISSION DATA PREPARATION SYSTEMS (SMDPS)	1	1
H. MAINTAINING CENTRAL INTEGRATED TEST SYSTEM GROUND PROCESSORS (CGP)	-	1
I. MAINTAINING DIGITAL (DIG) TEST STATIONS AND EQUIPMENT	4	3
J. MAINTAINING DIGITAL ANALOG VIDEO (DAV) TEST STATIONS AND EQUIPMENT	6	3
K. MAINTAINING RADIO FREQUENCY (RF) TEST STATIONS AND EQUIPMENT	2	1
L. MAINTAINING RADAR ELECTRONIC WARFARE (REW) TEST STATIONS AND EQUIPMENT	2	1

* Columns may not add to 100 percent due to rounding
- Indicates less than 1 percent

TABLE 6 (CONTINUED)

AVERAGE PERCENT TIME SPENT ON DUTIES BY DAFSC GROUPS*

DUTIES	DAFSC 45137/ 45157 (N=141)	DAFSC 45177 (N=74)
M. MAINTAINING ANALOG/DIGITAL TEST STATIONS (ADIT II) AND EQUIPMENT	-	0
N. MAINTAINING TRANSFER MODULE SERVICE SETS (TMSS) AND EQUIPMENT	0	0
O. MAINTAINING DIGITAL (DIG) LRUs AND TEST PROGRAM SETS (TPS)	12	5
P. MAINTAINING DIGITAL ANALOG VIDEO (DAV) LRUs AND TPSs	23	7
Q. MAINTAINING RADIO FREQUENCY (RF) LRUs AND TPSs	-	-
R. MAINTAINING RADAR ELECTRONIC WARFARE (REW) LRUs AND TPSs	-	-
S. MAINTAINING ANALOG/DIGITAL TEST STATION (ADIT II) LRUs AND TEST PROGRAM SETS (TPS)	-	0
T. MAINTAINING TRANSFER MODULE SERVICE SET (TMSS) LRUs AND TEST PROGRAM SETS (TPS)	0	0
U. MAINTAINING COMMUNICATION SYSTEMS	6	5
V. MAINTAINING NAVIGATION SYSTEMS	5	4
W. MAINTAINING TEST BRANCH PANELS	-	-
X. MAINTAINING MANUAL SUPPORT EQUIPMENT	2	2

* Columns may not add to 100 percent due to rounding
- Indicates less than 1 percent

of their time performing maintenance tasks on DIG and DAV 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.

Skill Level Descriptions

DAFSC 45137/45157. The 141 members of the 3- and 5-skill level group comprise 65 percent of the survey sample. These technicians perform a variety of maintenance duties associated with the DIG and DAV test stations (shown in Table 6). They also perform many administrative tasks and general avionics functions (Duty F). A small portion of the job involves manual test station maintenance, as indicated by Duties U, V, and X. Table 5 indicates that 65 percent of the group members are assigned to ATS maintenance, and 24 percent perform MTS maintenance. Another 5 percent (seven individuals) are training instructors. Group members perform 135 tasks on average, they average 50 months TAFMS, and 99 tasks account for over 50 percent of their time on the job. Table 7 shows representative tasks performed by the group, and Table 9 displays tasks which best differentiate the 3-/5-skill level members from the 7-skill level members.

DAFSC 45177. The 7-skill level group contains 74 members accounting for 34 percent of the survey sample. These members work in a variety of technical and supervisory capacities. Table 5 indicates that 27 percent of the 7-skill level DAFSC members work in ATS shops, 19 percent in MTS shops, and another 30 percent are performing more direct supervision. The time spent figures in Table 6 reflect that this group performs mostly a supervisory role, particularly in the administrative area (Duty E). However, technical duties are being performed, particularly in the general avionics (Duty F) and DAV work sections (Duty P). As a group, the 7-skill level members average 144 months TAFMS, they perform an average 124 tasks, and 88 of these tasks comprise over half of their job time. Table 8 displays tasks representative of the group, and Table 9 shows some tasks differentiating the 7-skill level members from the 3-/5-skill level group.

Summary

The jobs performed by the 3- and 5-skill level members are mostly technical, though a few group members are shift supervisors or training instructors (see Table 5). The 7-skill level members also perform some technical jobs, but they mostly work in administrative and supervisory positions. As individuals progress from the 3-skill level to the 7-skill level, they continue to perform technical jobs, but they spend much more of their time on supervisory tasks and less time on maintenance tasks. There is a trend toward increasing responsibilities as members advance, indicating that career ladder progression for 451X7 personnel is readily apparent.

TABLE 8

REPRESENTATIVE TASKS PERFORMED BY DAFSC 45177 AIRMEN
(PERCENT MEMBERS PERFORMING)

TASKS		DAFSC 45177 (N=74)
C73	WRITE APRs	79
B30	COUNSEL PERSONNEL	78
D78	ANNOTATE TRAINING RECORDS	74
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	73
E101	INITIATE OR REVIEW TECHNICAL ORDER SYSTEM FORMS, SUCH AS AFTO FORMS 22, 27, AND 32	73
D92	MAINTAIN TRAINING RECORDS	73
D90	EVALUATE PROGRESS OF TRAINEES	72
F164	INSPECT TEST EQUIPMENT	72
A8	DETERMINE WORK PRIORITIES	70
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	69
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	69
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	69
A21	PLAN OR SCHEDULE WORK PRIORITIES	62
D79	CONDUCT ON-THE-JOB TRAINING (OJT)	62
A20	PLAN OR SCHEDULE WORK ASSIGNMENTS	62
B49	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT SPECIALISTS (AFSC 45157)	59
B45	INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	59
F181	RESEARCH TECHNICAL ORDERS	58
F177	REPAIR CABLE ASSEMBLIES, SUCH AS REPLACING PINS, WIRES, OR HARDWARE	55
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	54
B48	SUPERVISE APPRENTICE B-1B AVIONICS TEST STATION AND COMPONENT SPECIALISTS (AFSC 45137)	54
F183	SOLDER COMPONENTS, SUCH AS RELAYS, RESISTERS, OR INTEGRATED CIRCUITS	53
D91	EVALUATE TRAINING METHODS AND TECHNIQUES	46
D89	EVALUATE EFFECTIVENESS OF TRAINING PROGRAMS	43

TABLE 9

TASKS WHICH BEST DIFFERENTIATE BETWEEN DAFSC 45137/45157 AND 45177 PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS		DAFSC 45137/ 45157 (N=141)	DAFSC 45177 (N=74)	DIFFERENCE
C73	WRITE APRs	22	80	-58
B30	COUNSEL PERSONNEL	26	78	-52
A8	DETERMINE WORK PRIORITIES	21	70	-49
D90	EVALUATE PROGRESS OF TRAINEES	24	72	-48
A16	ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	13	59	-46
A21	PLAN OR SCHEDULE WORK PRIORITIES	16	62	-46
B45	INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	15	59	-44
A20	PLAN OR SCHEDULE WORK ASSIGNMENTS	18	62	-44
B50	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT TECHNICIANS (AFSC 45157)	4	47	-43
A5	COORDINATE MAINTENANCE WORK WITH APPROPRIATE PERSONNEL OR AGENCIES	13	55	-42
D82	DETERMINE TRAINING REQUIREMENTS	5	46	-41
**********				
P492	OPERATIONALLY CHECK RADAR VIDEO-SIGNAL PROCESSORS (RVSP)	55	22	+33
J239	PERFORM DIAGNOSTIC TEST OF DAV TEST STATIONS	68	36	+32
0308	OPERATIONALLY CHECK TRACKING HANDLES	55	23	+32
P504	OPERATIONALLY CHECK VIDEO RECORDERS	48	18	+30
P486	OPERATIONALLY CHECK MEMORY STORAGE UNITS (MSU)	50	20	+30
J238	PERFORM CONFIDENCE TEST OF DAV TEST STATIONS	68	38	+30
J245	TROUBLESHOOT DAV TEST STATIONS	60	30	+30
P468	OPERATIONALLY CHECK ELECTRONIC DISPLAY UNITS	52	23	+29
P464	OPERATIONALLY CHECK DIGITAL COMPUTERS	44	15	+29
J235	ALIGN DAV TEST STATIONS	60	31	+29

ANALYSIS OF AFR 39-1 SPECIALTY DESCRIPTIONS

The results of the specialty job structure and skill level analyses were compared to the AFR 39-1 Specialty Descriptions (dated 1 February 1988) for the B-1B Avionics Test Station and Components specialty. An analysis of the 45137/45157 Specialty Description showed the document is well supported by survey data. One recommended change is to reword item 2b of the description to read, "Assembles units after repair." Also, there is currently no reference to core automated maintenance system (CAMS) functions, even though CAMS is used a great deal by 3-/5-skill level personnel. The data suggest this performance area should be added to the description.

A review of the 45177 Specialty Description with survey data reflected ample support for the document. One recommended change is to add a reference on performing CAMS functions, which is also a significant part of the 7-skill level job. A change recommended for both the 7-skill level description and the 3-/5-skill level description is to add the term "line replaceable unit (LRU)" to each of the areas under the DUTIES AND RESPONSIBILITIES section of the descriptions. Many tasks performed by both skill level groups deal particularly with LRUs, which indicates an addition of LRU to the documents is warranted.

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 first-term personnel. Factors useful for evaluating training include the description of the job being performed by first-enlistment members and their overall distribution across career ladder jobs, percentages of first-enlistment (1-48 months TAFMS) personnel performing specific tasks, as well as TD ratings (previously explained in the SURVEY METHODOLOGY section).

To assist in the examination of the AFSC 451X7 Specialty Training Standard (STS) and the Plan of Instruction (POI) for course G3ABR45137 000 (dated 15 November 1989), technical school personnel from Lowry Technical Training Center (TTC) matched tasks from the 451X7 job inventory to appropriate sections of these documents. This matching process allowed data comparisons to be made to those documents. Computer listings displaying the results of these STS and POI matchings, to include percent members performing tasks and TD ratings for each task, have been sent to the training personnel at Lowry AFB for their review. Some of this information is presented in the pages that follow.

First-Enlistment Personnel

There were 92 survey sample members in their first enlistment, representing approximately 43 percent of the sample. These specialists perform all aspects of the technical type jobs described in the SPECIALTY JOB section of this report. They do not perform functions associated with the

Supervisory cluster. The distribution of first-term personnel across the specialty jobs is displayed in Figure 2. The majority of the group (70 percent) is concentrated in the ATS Maintenance cluster, while 22 percent perform MTS maintenance. One first-enlistment member is assigned to the Technical Training Center at Lowry AFB CO. A list of tasks performed by all group members is found in Table 10. Table 11 shows representative tasks performed specifically by first-enlistment members in ATS maintenance, while Table 12 reflects tasks performed by first-termers in MTS maintenance. Table 13 shows a list of equipment operated by first-enlistment members in either ATS maintenance or MTS maintenance. A third column is included to show equipment operated by all first-enlistment personnel combined. As expected, the first-term personnel who work in ATS maintenance shops perform different tasks from those in MTS shops. Also, most equipment items shown in Table 13 tend to be operated by either the ATS group or the MTS group, not large numbers of both groups. Overall, the first-term group comprises about 65 percent of the 3-/5-skill level group, and the task listings for these groups are very similar. These data indicate that the ATS maintenance tasks should receive the greatest amount of emphasis during first-term training.

Task Difficulty Data

Task Difficulty (TD) ratings are based on the judgments of experienced career ladder NCOs working in Air Force operational units. TD ratings are collected to measure the relative learning difficulty of each job inventory task. These data, combined with percentages of first-enlistment personnel performing tasks, serve as a basis for determining whether training adjustments should be made. For example, if a task reflects a high difficulty rating and also has a high percentage of first-term members performing, then strong recommendations can be made to train the task to a high level. For a more complete description of these ratings, see the Task Factor Administration section in SURVEY METHODOLOGY.

TD ratings for this survey were assessed through the responses of 50 experienced career ladder NCOs. These ratings were standardized to provide a rank-ordered task list with an average difficulty of 5.00 and a standard deviation of 1.00. A listing of those tasks having the highest TD ratings is found in Table 14. These tasks involve troubleshooting and repairing inertial navigation units (INU), various test stations, transmitters, and some operational checks of equipment. Some of these tasks have many first-term members performing them, which indicates these tasks are of primary importance for first-term training in the basic course.

Specialty Training Standard (STS)

A thorough review of STS 451X7, dated October 1987 (with change from November 1989), allowed STS items to be compared with survey data. This review was made possible with the assistance of the previously mentioned technical training personnel from Lowry AFB. Most of the STS paragraphs and subparagraphs containing subject-matter knowledge or general knowledge requirements were not examined.

451X7 FIRST ENLISTMENT DISTRIBUTION ACROSS SPECIALTY JOBS (N= 92)

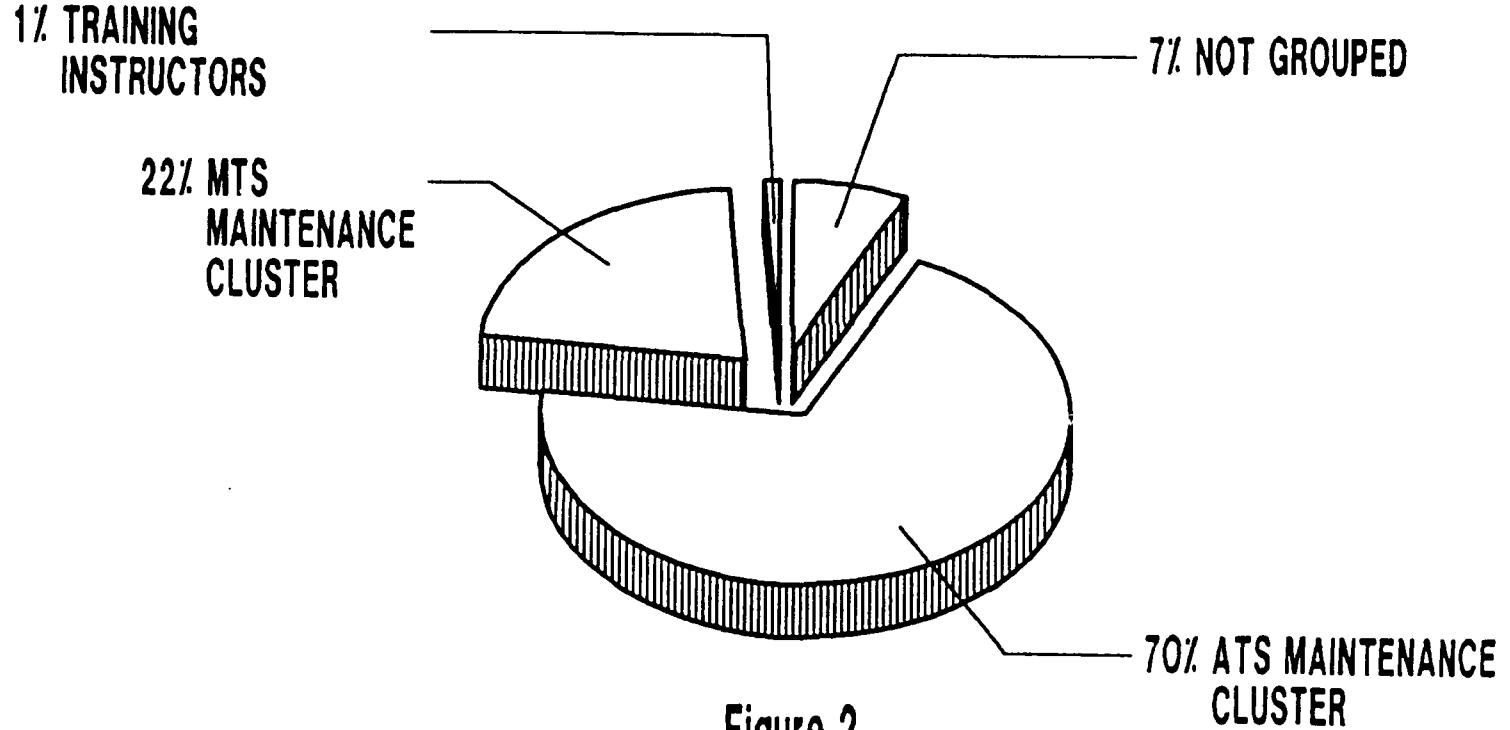

Figure 2

TABLE 10

REPRESENTATIVE TASKS PERFORMED BY DAFSC 451X7 AIRMEN WITH 1-48 MONTHS TAFMS

TASKS		PERCENT MEMBERS PERFORMING (N=92)
F159	CLEAN SHOP FACILITIES	93
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	90
F164	INSPECT TEST EQUIPMENT	88
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	83
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN IN REQUEST)	82
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	77
F177	REPAIR CABLE ASSEMBLIES, SUCH AS REPLACING PINS, WIRES, OR HARDWARE	77
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	76
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	75
J238	PERFORM CONFIDENCE TEST OF DAV TEST STATIONS	73
F157	CLEAN AND LUBRICATE EQUIPMENT COMPONENTS	73
F183	SOLDER COMPONENTS, SUCH AS RELAYS, RESISTERS, OR INTEGRATED CIRCUITS	73
J239	PERFORM DIAGNOSTIC TEST OF DAV TEST STATIONS	72
F172	PERFORM CORROSION CONTROL INSPECTIONS	72
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	70
F169	LOAD CONTROL AND SUPPORT SOFTWARE	67
F171	PACK OR UNPACK LINE REPLACEABLE UNITS (LRU) FOR STORAGE, SHIPMENT, OR CLIMATIC CONDITIONS	65
J245	TROUBLESHOOT DAV TEST STATIONS	65
I226	PERFORM CONFIDENCE TEST OF DIG TEST STATIONS	65
P492	OPERATIONALLY CHECK RADAR VIDEO-SIGNAL PROCESSORS (RVSP)	62
I229	PERFORM DIAGNOSTIC TEST OF DIG TEST STATIONS	61
J241	REPAIR DAV TEST STATIONS	60
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	59
P468	OPERATIONALLY CHECK ELECTRONIC DISPLAY UNITS	58
P455	OPERATIONALLY CHECK AVIONICS COMPUTER CONTROLS	51
E147	PROCESS DIFM ITEMS	49
E151	REVIEW AFTO FORMS 244 AND 245	45

TABLE 11

REPRESENTATIVE TASKS PERFORMED BY 1-48 MONTHS TAFMS AUTOMATIC TEST STATION (ATS) MAINTENANCE PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=63)
F159	CLEAN SHOP FACILITIES	97
J238	PERFORM CONFIDENCE TEST OF DAV TEST STATIONS	94
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	92
J239	PERFORM DIAGNOSTIC TEST OF DAV TEST STATIONS	92
I226	PERFORM CONFIDENCE TEST OF DIG TEST STATIONS	92
F169	LOAD CONTROL AND SUPPORT SOFTWARE	92
F164	INSPECT TEST EQUIPMENT	90
0308	OPERATIONALLY CHECK TRACKING HANDLES	90
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	87
I229	PERFORM DIAGNOSTIC TEST OF DIG TEST STATIONS	87
I233	TROUBLESHOOT DIG TEST STATIONS	87
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN IN REQUEST)	86
J245	TROUBLESHOOT DAV TEST STATIONS	86
I231	REPAIR DIG TEST STATIONS	86
F177	REPAIR CABLE ASSEMBLIES, SUCH AS REPLACING PINS, WIRES, OR HARDWARE	86
P492	OPERATIONALLY CHECK RADAR VIDEO-SIGNAL PROCESSORS (RVSP)	84
J241	REPAIR DAV TEST STATIONS	83
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	83
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	81
J235	ALIGN DAV TEST STATIONS	81
I223	ALIGN DIG TEST STATIONS	81
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	79
F157	CLEAN AND LUBRICATE EQUIPMENT COMPONENTS	78
P468	OPERATIONALLY CHECK ELECTRONIC DISPLAY UNITS	76
P455	OPERATIONALLY CHECK AVIONICS COMPUTER CONTROLS	70
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	68
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	60
P518	REPAIR AVIONICS COMPUTER CONTROLS	57

TABLE 12

REPRESENTATIVE TASKS PERFORMED BY 1-48 MONTHS TAFMS
MANUAL TEST STATION (MTS) MAINTENANCE PERSONNEL

TASKS		PERCENT MEMBERS PERFORMING (N=21)
F164	INSPECT TEST EQUIPMENT	95
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	95
U972	OPERATIONALLY CHECK AN/ARC-190 UHF RECEIVER-TRANSMITTERS	95
U996	REPAIR AN/ARC-190 UHF RECEIVER-TRANSMITTERS	95
V1049	OPERATIONALLY CHECK AN/ARN-118 TACAN RECEIVER-TRANSMITTERS	95
U973	OPERATIONALLY CHECK AN/ARC-190 UHF SET CONTROLS	95
U1020	TROUBLESHOOT AN/ARC-190 UHF RECEIVER-TRANSMITTERS	90
V1048	OPERATIONALLY CHECK AN/ARN-118 TACAN CONVERTERS	90
F159	CLEAN SHOP FACILITIES	86
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	86
F172	PERFORM CORROSION CONTROL INSPECTIONS	86
V1042	OPERATIONALLY CHECK AN/APN-230 DOPPLER RECEIVER-TRANSMITTERS	86
U971	OPERATIONALLY CHECK AN/ARC-190 UHF ANTENNA COUPLERS	86
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	81
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN IN REQUEST)	81
E 99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	81
U997	REPAIR AN/ARC-190 UHF SET CONTROLS	81
V1050	OPERATIONALLY CHECK AN/ARN-118 TACAN CONTROL BOXES	81
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	76
U1019	TROUBLESHOOT AN/ARC-190 UHF ANTENNA COUPLERS	76
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	71
E147	PROCESS DIFM ITEMS	71
F171	PACK OR UNPACK LINE REPLACEABLE UNITS (LRU) FOR STORAGE, SHIPMENT, OR CLIMATIC CONDITIONS	71
F157	CLEAN AND LUBRICATE EQUIPMENT COMPONENTS	67
U1017	TROUBLESHOOT AN/ARC-171 UHF RECEIVER-TRANSMITTERS	57

TABLE 13

EQUIPMENT OPERATED BY DAFSC 451X7 1-48 MONTHS TAFMS GROUPS

TASKS	PERCENT ATS MEMBERS PERFORMING (N=63)	PERCENT MTS MEMBERS PERFORMING (N=21)	PERCENT ALL MEMBERS PERFORMING (N=92)
Oscilloscopes	94	100	95
Digital Voltmeters	86	100	88
Signal Generators	51	100	60
Frequency Counters	19	100	36
Watt Meters	3	100	25
Dummy Loads	33	95	45
Distortion Analyzers	8	95	27
Torque Wrenches	92	90	90
Solder Stations	89	90	87
Power Meters	40	90	52
Pulse Generators	75	76	73
Analog Multimeters	25	76	35
Milliometers	40	52	43
Spectrum Analyzers	51	48	48
Pressure Testers	17	38	21
Logic State Analyzers	11	33	16
Disc Drive Head Alignment Kits	79	5	62
Photometers	70	0	51
Spot Meters	68	0	53
Disc Servo Kits	62	0	48
Disc Cleaners	37	0	27
Air Cooling Carts	33	0	26

TABLE 14

TASKS RATED HIGHEST IN TASK DIFFICULTY (TD)

TASKS		TSK DIFF*	PERCENT MEMBERS PERFORMING FIRST ENLIST (N=92)	DAFSC 45157 (N=105)	DAFSC 45177 (N=74)
P686	TROUBLESHOOT INUs	8.21	13	18	3
L267	TROUBLESHOOT RF DAAEs	7.96	7	13	8
L265	REPAIR RF DAAEs	7.67	7	13	8
P574	REPAIR INUs	7.62	11	15	3
Q740	REPAIR BAND 6 ANTENNA-TRANSMITTER TPSs	7.59	0	0	0
Q741	REPAIR BAND 6 ANTENNA-TRANSMITTERS	7.59	0	0	0
Q755	TROUBLSHOOT BAND 6 ANTENNA-RECEIVER TPSs	7.59	0	0	0
Q756	TROUBLSHOOT BAND 6 ANTENNA-RECEIVERS	7.59	0	0	0
Q757	TROUBLSHOOT BAND 6 ANTENNA-TRANSMITTER TPSs	7.59	0	0	0
Q758	TROUBLSHOOT BAND 6 ANTENNA-TRANSMITTERS	7.59	0	0	0
L266	TROUBLESHOOT REW TEST STATIONS	7.56	28	30	20
L264	REPAIR REW TEST STATIONS	7.31	27	32	20
P483	OPERATIONALLY CHECK INERTIAL NAVIGATION UNITS (INU)	7.26	14	19	1
H210	ISOLATE MALFUNCTIONS WITHIN CENTRAL INTEGRATED TEST SYSTEM GROUND PROCESSORS (CGP) USING SELF-DIAGNOSTIC TAPES	7.25	11	11	14
F167	ISOLATE MALFUNCTIONS USING DEBUG	7.17	15	19	27
U969	OPERATIONALLY CHECK AN/ARC-171 UHF RECEIVER-TRANSMITTERS	7.10	12	21	15
K255	TROUBLESHOOT RF TEST STATIONS	7.06	22	21	23
F168	ISOLATE MALFUNCTIONS USING ON-LINE COMPILER	7.04	28	33	24
P630	TROUBLESHOOT AVIONICS COMPUTER CONTROLS	6.95	38	35	20
J245	TROUBLESHOOT DAV TEST STATIONS	6.88	65	56	30
U1017	TROUBLESHOOT AN/ARC-171 UHF RECEIVER-TRANSMITTERS	6.84	13	22	16
X1131	OPERATIONALLY CHECK AN/ASC-19 AFSATCOM TEST SETS	6.79	10	17	14
F166	ISOLATE MALFUNCTIONS ON TEST EXECUTIVE	6.71	36	39	31
J244	TROUBLESHOOT DAV PHOTOMETRIC BENCHES	6.71	36	41	26
U1020	TROUBLESHOOT AN/ARC-190 UHF RECEIVER-TRANSMITTERS	6.67	21	26	20
I230	REPAIR DIG DAAEs	6.67	20	16	12

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0 (High TD ratings are 6.0 and above)

TABLE 14 (CONTINUED)

TASKS RATED HIGHEST IN TASK DIFFICULTY (TD)

TASKS		TSK DIFF*	PERCENT MEMBERS PERFORMING: FIRST ENLIST (N=92)	DAFSC 45157 (N=105)	DAFSC 45177 (N=74)
P542	REPAIR ELECTRONIC DISPLAY UNITS	6.63	41	38	20
J241	REPAIR DAV TEST STATIONS	6.61	60	56	30
J247	TROUBLESHOOT DAV 5.6 KHZ POWER SOURCE MODULE	6.53	26	36	18
P592	REPAIR RTIs	6.47	26	20	16
P654	TROUBLESHOOT ELECTRONIC DISPLAY UNITS	6.42	41	36	20
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	6.41	76	80	69

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0 (High TD ratings are 6.0 and above)

The normal criterion for including an item on the STS is that tasks matched to the STS item be performed by at least 20 percent of the first-job, first-enlistment, 5-skill level, or 7-skill level DAFSC personnel. Based upon the 20 percent performing criterion, the data did not readily support several areas in the STS. Some of these areas covered tester replaceable units, signal conditioners, magnetic tape transports, Jammer Logic A (JLA) devices, receiver threshold controls, and direction-finding (DF) encoders. Table 15 shows a few examples of STS elements that have matched inventory tasks with low percent members performing values and moderate or low TD ratings. These and other unsupported items are recommended for consideration by subject-matter experts for possible deletion from the STS based on the data. Training personnel should carefully review all areas of the STS to determine which areas are suitable for deletion.

There were also a significant number of STS elements identified for review of 3-skill level proficiency codes. Some of these elements are shown in Table 16. To use an example, item 8e of Table 16 has one task matched to it (E 143) with a task knowledge code "b," and 90 percent first-term members performing. The accompanying TD rating is above average. The data suggest this STS item would be more appropriately coded with a task knowledge and performance rating, such as "1a." Similarly, items 9d, 17e(6), and 22b(34)(d) are recommended for raising the coding level to reflect a task knowledge and performance training requirement. In contrast, those items in Table 16 referring to the air data computer (ADC) and encoder have little data support for training. Therefore, it is recommended these items be coded with a "-" to reflect training by OJT only. Training personnel should carefully review all of the 3-skill level proficiency codes for the AFSC 451X7 STS.

Table 17 displays tasks not matched to the STS which have greater than 20 percent members performing them. Some of these tasks concern operational checks of digital computers, test station calibrations, forms administration, and updating software. Data for these unreferenced tasks suggest they should be included in the STS. These tasks may already fit under an STS paragraph, but simply were not referenced to one, or they may be functions not currently reflected in any STS element. The data indicate a review of the STS is necessary for the possible inclusion of these tasks in the next STS revision.

Plan of Instruction (POI)

The POI for Course G3ABR45137-000 (dated 15 November 1989) was reviewed with the assistance of technical school personnel at Lowry TTC. Job inventory tasks were matched to these documents to provide data on TD and percent first-enlistment personnel performing tasks. In accordance with ATCR 52-22, and for cost effectiveness reasons, if the probability of first-enlistment performance for a POI objective falls below 30 percent, then that objective should not be taught in a resident training course without further justification. For example, it may be justifiable to retain a POI objective having less than 30 percent members performing tasks, based upon high TD ratings for those tasks matched to the objective. Critical or safety items may also be justified for formal training.

TABLE 15

STS PERFORMANCE ELEMENTS REFLECTING
LOW PERCENT MEMBERS PERFORMING TASKS
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENTS	TASKS	PERCENT MEMBERS PERFORMING FIRST JOB (N=42)	FIRST ENLIST (N=92)	DAFSC 45157 (N=105)	DAFSC 45177 (N=74)	TSK DIFF*
0058 6a(4).	Report of survey					
E121	Make entries on AF Forms 198 (Report of Survey for Air Force Property)	0	0	1	12	3.92
0124 9h.	Calibrate assigned Category II test equipment					
F156	Calibrate Category II test equipment	2	5	11	15	5.13
0179 13c(2).	Alignment and repair of Magnetic tape transport					
G187	Align SMDPS magnetic tape transports	0	0	4	14	5.10
G200	Repair SMDPS magnetic tape transports	0	0	3	11	5.83
0316 21a(3).	Repair oil cooling carts					
F179	Repair oil cooling carts	0	0	0	0	5.18

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0
(High TD ratings are 6.0 and above)

TABLE 15 (CONTINUED)

STS PERFORMANCE ELEMENTS REFLECTING
LOW PERCENT MEMBERS PERFORMING TASKS
(LESS THAN 20 PERCENT MEMBERS PERFORMING)

STS ELEMENTS	TASKS	PERCENT MEMBERS PERFORMING				
		FIRST JOB (N=42)	FIRST ENLIST (N=92)	DAFSC 45157 (N=105)	DAFSC 45177 (N=74)	TSK DIFF*
0494	22a(22)(d). Troubleshoot Jammer Logic A					
0420	Troubleshoot JLAs	0	0	0	0	0.00
0495	22a(22)(e). Repair Jammer Logic A					
0352	Repair JLAs	0	0	0	0	0.00
0518	22a(25)(d). Troubleshoot receiver threshold controls					
0426	Troubleshoot receiver threshold controls	0	1	1	1	5.23
0519	22a(25)(e). Repair receiver threshold controls					
0358	Repair receiver threshold controls	0	2	1	0	5.50

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0 (High TD ratings are 6.0 and above)

TABLE 16

EXAMPLE STS ELEMENTS REQUIRING REVIEW OF 3-SKILL LEVEL PROFICIENCY CODES

STS ELEMENT (WITH SELECTED SAMPLE TASKS)	PROF CODE	FIRST ENL (N=92)	TSK DIFF*
0115 8e. Perform CAMS functions			
E143 Perform core automated maintenance system (CAMS) functions	b	90	5.71
0120 9d. Repair wire wrap connections			
F177 Repair cable assemblies, such as replacing pins, wires, or hardware	-	77	5.38
F180 Repair wire wrap connections		40	5.08
0269 17e(6). Repair digital analog video (DAV) test station			
J241 Repair DAV test stations	b	60	6.61
P517 Repair avionics computer control TPSs		40	5.97
P587 Repair radar video-signal processor TPSs		39	5.67
J240 Repair DAV photometric benches		33	6.25
0870 22b(34)(d). Troubleshoot avionics computer control			
P630 Troubleshoot avionics computer controls	-	38	6.95

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0 (High TD ratings are 6.0 and above)

TABLE 16 (CONTINUED)

EXAMPLE STS ELEMENTS REQUIRING REVIEW OF 3-SKILL LEVEL PROFICIENCY CODES

STS ELEMENT (WITH SELECTED SAMPLE TASKS)	PROF CODE	FIRST ENL (N=92)	TSK DIFF*
0829 22b(29)(c). Perform operational checks on ADC			
P449 Operationally check air data computer (ADC)	2b	2	3.40
0830 22b(29)(d). Troubleshoot ADCs			
P618 Troubleshoot ADCs	2b	1	5.58
1241 22d(16)(e). Repair encoder			
R829 Repair REW encoders	b	0	0.00

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0 (High TD ratings are 6.0 and above)

TABLE 17

EXAMPLE TASKS WITH MORE THAN 20 PERCENT MEMBERS PERFORMING
NOT MATCHED TO STS ELEMENTS
(PERCENT MEMBERS PERFORMING)

TASKS		PERCENT MEMBERS PERFORMING FIRST ENLIST (N=92)	DAFSC 45157 (N=105)	DAFSC 45177 (N=74)	TSK DIFF*
MISCELLANEOUS TASKS					
P464	OPERATIONALLY CHECK DIGITAL COMPUTERS	46	40	15	4.54
I224	ASSIST IN THE CALIBRATION OF DIG TEST STATIONS	41	39	23	3.76
I236	ASSIST IN THE CALIBRATION OF DAV TEST STATIONS	39	38	23	3.80
F158	CLEAN OPTICAL SURFACES OR CONTACTS	38	33	32	3.01
E136	MAKE ENTRIES ON DD FORMS 1348-6 (DOD SINGLE LINE ITEM REQUISITION SYSTEM DOCUMENT)	35	41	53	4.28
E135	MAKE ENTRIES ON DD FORMS 1348-1 (DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT)	33	38	57	3.28
E134	MAKE ENTRIES ON AFTO FORMS 95 (SIGNIFICANT HISTORICAL DATA)	27	23	20	3.23
E120	MAKE ENTRIES ON AF FORMS 1297 (TEMPORARY ISSUE RECEIPT)	25	34	55	2.14
P534	REPAIR COUNTERMEASURES DISPENSER CONTROLS	24	30	11	4.95
E115	MAINTAIN TECHNICAL ORDER FILES	21	18	32	5.56
F184	UPDATE SOFTWARE	20	17	22	4.58
0337	REPAIR DSO POWER PANEL TPSs	20	23	14	4.87

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0
(High TD ratings are 6.0 and above)

A review of the tasks matched to the G3ABR45137 000 POI showed the data partially support the corresponding blocks and units of instruction. There were 105 matched POI objectives, and 43 of those were not supported by survey data. Some unsupported areas concerned identification of test equipment categories, and operations checks and troubleshooting of certain equipment. These unsupported equipment items include control and display panels, receiver threshold controls, Jammer Logic A, air data computers, and electronic controllers. Based on the lack of supporting data reflected in Table 18, these POI objectives are recommended for deletion from training unless further justification can be provided. Technical training personnel should thoroughly review the entire listing of POI objectives and delete those not appropriate for first-enlistment training.

Upon further review of the task data, approximately 89 of the 1,157 inventory task statements having more than 30 percent members performing tasks were not matched to the POI. Some examples of these tasks are:

Perform core automated maintenance system (CAMS) functions
Perform confidence test of DAV test stations
Troubleshoot radar video-signal processor TPSs
Operationally check multifunction display indicators (MDI)
Troubleshoot avionics computer controls
Troubleshoot avionics computer control TPSs
Repair electronic marker generators

A more comprehensive list of those tasks not referenced to the POI is provided by category in Table 19. Many of these tasks also have moderate or high TD ratings, suggesting that these tasks should be considered for inclusion in training. Therefore, a review of these unreferenced tasks is warranted, to determine the feasibility of training them formally in the basic course at the tech school.

ELECTRONIC PRINCIPLES INVENTORY (EPI)

Electronics principles data for AFSC 451X7 personnel were collected from September 1987 through April 1988. Task statements from the Electronic Principles Inventory were matched to Electronic Fundamentals/Applications STS 1, dated 20 February 1987. Those STS 1 elements, having matched tasks with less than 20 percent of the EPI survey members responding "yes" to the item, are presented in Appendix B of this report. For the 451X7 personnel, these particular items are not recommended for training.

TABLE 18

TASKS REFERENCED TO POI G3ABR45137 WITH
LESS THAN 30 PERCENT MEMBERS PERFORMING
(PERCENT FIRST ENLISTMENT PERFORMING)

TASK	PCT 1ST ENL	TSK DIFF*
054 IV 2f. Identify facts pertaining to test equipment categories		
F163 Identify test equipment categories	15	3.71
125 XI 1e. Using technical data, determine procedures for repairing the CITS Control and Display Panel		
0320 Repair CCD panels	20	4.89
129 XI 2c. Using technical data, perform selected operational checks on the Jammer Logic A (JLA)		
0298 Operationally check Jammer Logic A (JLA)	0	3.20
0136 XI 3d. Using technical data, troubleshoot a faulty RTC		
0303 Operationally check receiver threshold controls	0	3.29

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0
(High TD ratings are 6.0 and above)

TABLE 18 (CONTINUED)

TASKS REFERENCED TO POI G3ABR45137 WITH
LESS THAN 30 PERCENT MEMBERS PERFORMING
(PERCENT FIRST ENLISTMENT PERFORMING)

TASK	PCT 1ST ENL	TSK DIFF*
0169 XIV 1c. Using technical data, perform selected operational checks on the Electronic Controller SPS		
P467 Operationally check electronic controller secondary power panels	0	2.86
0214 XVIII 2a. Using technical data, perform selected portions of Confidence Test for the RF DAAE		
L261 Perform confidence test of RF defensive automatic test equipment (ATE) augmentation equipment (DAE)	10	5.16
0198 XVII 2a. Using technical data, perform selected portions of the Adjustments on the R/EW Test Station		
L256 Adjust radar electronic warfare (REW) test stations	17	5.10

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0
(High TD ratings are 6.0 and above)

TABLE 19

TASKS NOT REFERENCED TO POI G3ABR45137 WITH
GREATER THAN 30 PERCENT MEMBERS PERFORMING
(PERCENT FIRST ENLISTMENT PERFORMING)

TASKS		PCT 1ST ENL	TSK DIFF*
MISCELLANEOUS TASKS			
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	90	5.71
F177	REPAIR CABLE ASSEMBLIES, SUCH AS REPLACING PINS, WIRES, OR HARDWARE	77	5.38
F183	SOLDER COMPONENTS, SUCH AS RELAYS, RESISTORS, OR INTEGRATED CIRCUITS	73	5.20
J238	PERFORM CONFIDENCE TEST OF DAV TEST STATIONS	73	3.62
F172	PERFORM CORROSION CONTROL INSPECTIONS	72	3.59
I233	TROUBLESHOOT DIG TEST STATIONS	62	6.37
MAINTAINING DAV LRUs AND TPSs			
P504	OPERATIONALLY CHECK VIDEO RECORDERS	52	5.86
P588	REPAIR RADAR VIDEO-SIGNAL PROCESSORS	49	5.87
P700	TROUBLESHOOT RADAR VIDEO-SIGNAL PROCESSORS	48	6.23
P518	REPAIR AVIONICS COMPUTER CONTROLS	42	6.30
MAINTAINING DIGITAL LRUs AND TPSs			
0328	REPAIR CITS AIRBORNE PRINTERS	41	5.22
0372	REPAIR TRACKING HANDLES	41	4.71
0378	REPAIR 10-CHANNEL PROXIMITY SWITCH ELECTRIC UNITS	41	4.53
0448	TROUBLESHOOT 20-CHANNEL PROXIMITY SWITCH ELECTRIC UNITS	41	4.81

* Task Difficulty (TD) has an average of 5.0 and a Standard Deviation of 1.0
(High TD ratings are 6.0 and above)

The 34 members of the 451X7 DAFSC group reflected high performance on STS elements concerning basic terms and circuits, circuit calculations, tracing schematics, and applying operating theory and troubleshooting principles to a variety of components and electrical equipment. These electronic fundamentals areas are considered most critical for first-term members to know and are listed in Table 20 of this report. Training personnel can use these data to develop a specialized electronics course for the 451X7 personnel.

JOB SATISFACTION ANALYSIS

An important part of the OSR process involves the analysis of job satisfaction data. These data can be used by career ladder managers to gain a better understanding of those factors affecting job performance of 451X7 personnel. These factors include expressed job interest, utilization of talents and training, and reenlistment intentions. This survey compared job satisfaction indicators on two levels. Table 21 displays job satisfaction indicators for AFSC 451X7 TAFMS groups and a comparative sample group consisting of other mission equipment maintenance career ladders surveyed in 1989. Table 22 displays job satisfaction data for the survey specialty jobs.

The overall job satisfaction expressed within these tables was good for the 451X7 TAFMS groups and identified specialty jobs. Data comparisons in Table 21 indicate the 451X7 members have only slightly lower satisfaction for all TAFMS groups, compared to the other mission equipment maintenance career ladders surveyed. One factor of primary consideration is the 'reenlistment intentions' for the 1-48 months TAFMS group, where only 55 percent of that group indicated they would reenlist. Also, the 'sense of accomplishment' indicator for the 49-96 month and 97+ month TAFMS groups had slightly low values. As Table 21 shows, only 58 percent of the 49-96 month TAFMS members were satisfied with their sense of accomplishment from their jobs. A corresponding 56 percent of the 97+ month TAFMS group felt a sense of accomplishment. Aside from these particular indicators, the job satisfaction for the 451X7 personnel was good.

Job satisfaction data presented in Table 22 for the identified specialty jobs, reflect good satisfaction overall, particularly for the MTS Shift Supervisors and the Shop Chiefs. The lowest indicators were reported by the ATS Maintenance cluster personnel and the MTS Technicians. Positive reenlistment intentions for these two groups were 59 percent and 57 percent, respectively. There is an apparent trend toward higher satisfaction as 451X7 members advance on to supervisory positions.

TABLE 20

AFSC 451X7 ELECTRONICS FUNDAMENTALS STS AREAS WITH 30 PERCENT OR MORE DAFSC 451X7 PERSONNEL PERFORMING ASSOCIATED TASKS
(Data collected through responses of 34 EPI survey members)

STS ELEMENTS	STS ELEMENTS
1. Basic Terms	19. Solder/Desolder
2. Basic Circuits	20. Solderless Connectors
3. Basic Circuit Calculations	21. Test Equipment Usage
4. Resistors	22. Transistor Amplifier Circuits
5. Relays/Solenoids	23. Operational Amplifiers
6. Inductors	24. Power Supply Circuits
7. Capacitors	25. Voltage Regulators
8. Transformers	26. Wave Generating Circuits
9. AC and DC Motors	27. Frequency Generating Circuits
10. AC and DC Generators	28. Limiter Circuits
11. Synchro/Servos	29. Digital Numbering Systems
12. Choppers	30. Digital Logic Functions
13. Transducers	31. Computers
14. Meter Movements	32. Logic Circuits
15. Solid State Diodes and Special Devices	33. Converters
16. Bipolar Junction Resistors	34. Wave Guides
17. Integrated Circuits	35. Transmitters/Receivers
18. Cathode Ray Tubes	36. Antennas

TABLE 21

COMPARISON OF JOB SATISFACTION INDICATORS FOR 451X7 AND COMPARATIVE SAMPLE GROUP
(PERCENT MEMBERS RESPONDING)*

	1-48 MONTHS TAFMS		49-96 MONTHS TAFMS		97+ MONTHS TAFMS	
	1990 (N=92)	COMP SAMPLE** (N=2,658)	1990 (N=43)	COMP SAMPLE** (N=1,930)	1990 (N=79)	COMP SAMPLE** (N=2,575)
EXPRESSED JOB INTEREST:						
INTERESTING	71	76	70	75	63	77
SO-SO	12	15	14	16	24	14
DULL	17	8	16	8	13	8
PERCEIVED UTILIZATION OF TALENTS:						
FAIRLY WELL TO PERFECTLY	73	84	82	85	75	85
LITTLE OR NOT AT ALL	27	15	19	14	25	15
PERCEIVED UTILIZATION OF TRAINING:						
FAIRLY WELL TO PERFECTLY	75	88	79	83	72	82
LITTLE OR NOT AT ALL	25	12	21	16	28	18
SENSE OF ACCOMPLISHMENT:						
SATISFIED	63	76	58	75	56	74
NEUTRAL	11	14	7	12	8	11
DISSATISFIED	26	9	35	11	37	14
REENLISTMENT INTENTIONS:						
YES, OR PROBABLY YES	55	61	74	72	71	75
NO, OR PROBABLY NO	45	37	26	26	15	10
PLAN TO RETIRE	0	-	0	-	13	14

* Columns may not add to 100 percent due to rounding or lack of response
** Comparative sample of Mission Equipment Maintenance AFSCs surveyed in 1989 including 362X4, 411X2A, 454X0A/B, 451X4
- Indicates less than 1 percent responding

TABLE 22

JOB SATISFACTION DATA FOR CLUSTER AND JOB TYPES
(PERCENT MEMBERS RESPONDING)*

	AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER	MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER	JOB TYPES	
			MTS TECHNICIANS	SHIFT SUPERVISORS
EXPRESSED JOB INTEREST:				
INTERESTING	68	73	65	94
SO-SO	12	17	30	0
DULL	20	10	4	6
PERCEIVED UTILIZATION OF TALENTS:				
FAIRLY WELL TO PERFECTLY	70	88	91	100
LITTLE OR NOT AT ALL	31	13	9	0
PERCEIVED UTILIZATION OF TRAINING:				
FAIRLY WELL TO PERFECTLY	72	83	83	94
LITTLE OR NOT AT ALL	29	17	17	6
REENLISTMENT INTENTIONS:				
YES, OR PROBABLY YES	59	71	57	94
NO, OR PROBABLY NO	41	21	43	6
PLAN TO RETIRE	0	0	0	0

* Columns may not add to 100 percent due to rounding or a lack of response

TABLE 22 (CONTINUED)

JOB SATISFACTION DATA FOR CLUSTER AND JOB TYPES
(PERCENT MEMBERS RESPONDING)*

		JOB TYPES		
	SUPERVISORY CLUSTER	SHIFT/PRODUCTION SUPERVISORS	SHOP CHIEFS	TRAINING INSTRUCTOR IJT
EXPRESSED JOB INTEREST:				
INTERESTING	71	75	73	62
SO-SO	25	13	27	15
DULL	4	13	0	23
PERCEIVED UTILIZATION OF TALENTS:				
FAIRLY WELL TO PERFECTLY	83	75	91	62
LITTLE OR NOT AT ALL	17	25	9	38
PERCEIVED UTILIZATION OF TRAINING:				
FAIRLY WELL TO PERFECTLY	80	76	91	77
LITTLE OR NOT AT ALL	21	25	9	23
REENLISTMENT INTENTIONS:				
YES, OR PROBABLY YES	63	63	64	85
NO, OR PROBABLY NO	8	25	0	8
PLAN TO RETIRE	29	13	36	8

* Columns may not add to 100 percent due to rounding or a lack of response

IMPLICATIONS

Personnel from those Air Force specialties which were brought together to form the 451X7 career ladder have, to some extent, been integrated in terms of tasks performed on the job. These different specialties have been consolidated into two primary jobs, involving automatic test station (ATS) and manual test station (MTS) functions. Though members from the ATS shops do not readily interact with the MTS personnel, they do eventually work on manual test stations once they gain the necessary experience at the 5-skill level. This consolidation of personnel should assist technical training personnel in their future development of a standardized training program. Career ladder progression for the 3- and 5-skill level personnel is limited, but becomes significantly more supervisory in nature as members advance to the 7-skill level. The AFR 39-1 Specialty Descriptions are well supported by survey data, but some changes are recommended for including line replaceable units (LRU) in the DUTIES AND RESPONSIBILITIES section of the 3-/5-skill level and 7-skill level descriptions. Other minor changes are also recommended for the AFR 39-1 descriptions. Job satisfaction for career ladder members is generally very good, but reenlistment intentions for 1-48 month TAFMS group members may warrant investigation.

Analysis of the AFSC 451X7 STS reflected adequate support for some areas, but there are a significant number of unsupported areas. Some of the questionable items concern equipment maintenance for the tester replaceable units, signal conditioners, and receiver threshold controls, to name a few items. These STS items should be closely reviewed to ascertain whether they belong in the STS. There were also several STS 3-skill level proficiency codes recommended for changes. Some tasks, not referenced to the STS, which had supporting data are also recommended for review and possible inclusion in future revisions of the training program.

A thorough analysis of POI G3ABR45137 000, dated 15 November 1989, revealed several unsupported POI objectives. Some of these objectives refer to control and display panels, receiver threshold controllers, and Jammer Logic A devices. There were also several tasks performed by many first-enlistment personnel which were not matched to the POI, but may warrant inclusion in the future. Training personnel should review these objectives and tasks to determine what is most important for the training program.

APPENDIX A

SELECTED REPRESENTATIVE TASKS PERFORMED BY CAREER LADDER STRUCTURE GROUPS

TABLE A1

REPRESENTATIVE TASKS PERFORMED BY
AUTOMATIC TEST STATION (ATS) MAINTENANCE CLUSTER
(ST0017)

GROUP SIZE: 111
PREDOMINATE PAYGRADES: E3
PERCENT OF SAMPLE: 51%

AVERAGE TICF: 26 MONTHS
AVERAGE TAFMS: 57 MONTHS
AVERAGE # TASKS PERFORMED: 166

TASKS		PERCENT MEMBERS PERFORMING
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	93
F169	LOAD CONTROL AND SUPPORT SOFTWARE	93
F159	CLEAN SHOP FACILITIES	91
F164	INSPECT TEST EQUIPMENT	91
F177	REPAIR CABLE ASSEMBLIES, SUCH AS REPLACING PINS, WIRES, OR HARDWARE	90
J239	PERFORM DIAGNOSTIC TEST OF DAV TEST STATIONS	89
J238	PERFORM CONFIDENCE TEST OF DAV TEST STATIONS	89
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	88
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	88
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	88
I226	PERFORM CONFIDENCE TEST OF DIG TEST STATIONS	87
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN-IN REQUEST)	87
I229	PERFORM DIAGNOSTIC TEST OF DIG TEST STATIONS	85
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	84
I233	TROUBLESHOOT DIG TEST STATIONS	84
F161	EXECUTE FIND ALIGN	84
J245	TROUBLESHOOT DAV TEST STATIONS	83
I231	REPAIR DIG TEST STATIONS	83
F157	CLEAN AND LUBRICATE EQUIPMENT COMPONENTS	83
F183	SOLDER COMPONENTS, SUCH AS RELAYS, RESISTERS, OR INTEGRATED CIRCUITS	83
J241	REPAIR DAV TEST STATIONS	82
J235	ALIGN DAV TEST STATIONS	82
I222	ADJUST DIGITAL (DIG) TEST STATIONS	81
0308	OPERATIONALLY CHECK TRACKING HANDLES	81
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	75
P455	OPERATIONALLY CHECK AVIONICS COMPUTER CONTROLS	63
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	60
P518	REPAIR AVIONICS COMPUTER CONTROLS	59

TABLE A2

REPRESENTATIVE TASKS PERFORMED BY
MANUAL TEST STATION (MTS) MAINTENANCE CLUSTER
(ST0015)

GROUP SIZE: 48
PREDOMINATE PAYGRADES: E4
PERCENT OF SAMPLE: 22%

AVERAGE TICF: 29 MONTHS
AVERAGE TAFMS: 76 MONTHS
AVERAGE # TASKS PERFORMED: 121

TASKS		PERCENT MEMBERS PERFORMING
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	98
U972	OPERATIONALLY CHECK AN/ARC-190 UHF RECEIVER-TRANSMITTERS	96
U973	OPERATIONALLY CHECK AN/ARC-190 UHF SET CONTROLS	96
F164	INSPECT TEST EQUIPMENT	94
U996	REPAIR AN/ARC-190 UHF RECEIVER-TRANSMITTERS	92
F159	CLEAN SHOP FACILITIES	90
U1020	TROUBLESHOOT AN/ARC-190 UHF RECEIVER-TRANSMITTERS	90
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	90
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	88
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN-IN REQUEST)	88
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	88
V1042	OPERATIONALLY CHECK AN/APN-230 DOPPLER RECEIVER-TRANSMITTERS	88
U971	OPERATIONALLY CHECK AN/ARC-190 UHF ANTENNA COUPLERS	88
U997	REPAIR AN/ARC-190 UHF SET CONTROLS	85
F172	PERFORM CORROSION CONTROL INSPECTIONS	83
V1049	OPERATIONALLY CHECK AN/ARN-118 TACAN RECEIVER-TRANSMITTERS	83
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	83
U995	REPAIR AN/ARC-190 UHF ANTENNA COUPLERS	81
U1019	TROUBLESHOOT AN/ARC-190 UHF ANTENNA COUPLERS	81
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	77
U1048	OPERATIONALLY CHECK AN/ARN-118 TACAN CONVERTERS	77
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	73
E157	CLEAN AND LUBRICATE EQUIPMENT COMPONENTS	71
U1017	TROUBLESHOOT AN/ARC-171 UHF RECEIVER-TRANSMITTERS	71
F147	PROCESS DIFM ITEMS	69
U969	OPERATIONALLY CHECK AN/ARC-171 UHF RECEIVER-TRANSMITTERS	65
F171	PACK OR UNPACK LINE REPLACEABLE UNITS (LRU) FOR STORAGE, SHIPMENT, OR CLIMATIC CONDITIONS	65

TABLE A3

REPRESENTATIVE TASKS PERFORMED BY
MTS TECHNICIANS
(ST0055)

GROUP SIZE: 23
PREDOMINATE PAYGRADES: E3-E4
PERCENT OF SAMPLE: 11%

AVERAGE TICF: 25 MONTHS
AVERAGE TAFMS: 51 MONTHS
AVERAGE # TASKS PERFORMED: 97

TASKS		PERCENT MEMBERS PERFORMING
U972	OPERATIONALLY CHECK AN/ARC-190 UHF RECEIVER-TRANSMITTERS	100
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	100
F164	INSPECT TEST EQUIPMENT	100
U973	OPERATIONALLY CHECK AN/ARC-190 UHF SET CONTROLS	100
U996	REPAIR AN/ARC-190 UHF RECEIVER-TRANSMITTERS	96
U1020	TROUBLESHOOT AN/ARC-190 UHF RECEIVER-TRANSMITTERS	96
V1049	OPERATIONALLY CHECK AN/ARN-118 TACAN RECEIVER-TRANSMITTERS	96
U997	REPAIR AN/ARC-190 UHF SET CONTROLS	96
U971	OPERATIONALLY CHECK AN/ARC-190 UHF ANTENNA COUPLERS	96
V1075	TROUBLESHOOT AN/ARN-118 TACAN RECEIVER-TRANSMITTERS	91
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	91
V1063	REPAIR AN/ARN-118 TACAN RECEIVER-TRANSMITTERS	91
U1048	OPERATIONALLY CHECK AN/ARN-118 TACAN CONVERTERS	91
U1019	TROUBLESHOOT AN/ARC-190 UHF ANTENNA COUPLERS	87
V1042	OPERATIONALLY CHECK AN/APN-230 DOPPLER RECEIVER-TRANSMITTERS	87
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	87
F159	CLEAN SHOP FACILITIES	83
U995	REPAIR AN/ARC-190 UHF ANTENNA COUPLERS	83
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN-IN REQUEST)	83
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	83
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	78
F172	PERFORM CORROSION CONTROL INSPECTIONS	78
U1017	TROUBLESHOOT AN/ARC-171 UHF RECEIVER-TRANSMITTERS	74
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	74
E147	PROCESS DIFM ITEMS	70
U969	OPERATIONALLY CHECK AN/ARC-171 UHF RECEIVER-TRANSMITTERS	65
U993	REPAIR AN/ARC-171 UHF ANTENNA COUPLERS	61

TABLE A4

REPRESENTATIVE TASKS PERFORMED BY
SHIFT SUPERVISORS
(ST0108)

GROUP SIZE: 17
PREDOMINATE PAYGRADES: E5
PERCENT OF SAMPLE: 8%

AVERAGE TICF: 36 MONTHS
AVERAGE TAFMS: 119 MONTHS
AVERAGE # TASKS PERFORMED: 189

TASKS		PERCENT MEMBERS PERFORMING
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	100
A8	DETERMINE WORK PRIORITIES	100
E123	MAKE ENTRIES ON AF FORMS 2005 (ISSUE/TURN-IN REQUEST)	100
U972	OPERATIONALLY CHECK AN/ARC-190 UHF RECEIVER-TRANSMITTERS	100
D79	CONDUCT ON-THE-JOB TRAINING (OJT)	100
E144	PERFORM SECURITY CHECKS OF TOOLS AND EQUIPMENT	100
U979	OPERATIONALLY CHECK AN/ASC-19 AFSATCOM TELEPRINTERS	100
V1041	OPERATIONALLY CHECK AN/APN-224 RADAR ALTIMETER RECEIVER-TRANSMITTERS	100
V1055	REPAIR AN/APN-224 RADAR ALTIMETER RECEIVER-TRANSMITTERS	100
U973	OPERATIONALLY CHECK AN/ARC-190 UHF SET CONTROLS	100
U978	OPERATIONALLY CHECK AN/ASC-19 AFSATCOM TELEGRAPH MODEM AND MEMORY UNITS	100
U977	OPERATIONALLY CHECK AN/ASC-19 AFSATCOM MODEM CONTROLS	100
U996	REPAIR AN/ARC-190 UHF RECEIVER-TRANSMITTERS	100
U1020	TROUBLESHOOT AN/ARC-190 UHF RECEIVER-TRANSMITTERS	100
U1020	TROUBLESHOOT AN/ASC-19 AFSATCOM TELEPRINTERS	100
A21	PLAN OR SCHEDULE WORK PRIORITIES	94
A1	ASSIGN MAINTENANCE AND REPAIR WORK	94
U993	REPAIR AN/ARC-171 UHF RECEIVER-TRANSMITTERS	94
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	94
E128	MAKE ENTRIES ON AFCOMSEC FORMS 16 (COMSEC ACCOUNT DAILY-SHIFT INVENTORY)	94
U1017	TROUBLESHOOT AN/ARC-171 UHF RECEIVER-TRANSMITTERS	94
E103	INVENTORY TOOLS, SUCH AS CONSOLIDATED TOOL KITS (CTK)	94
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	94
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	94
U969	OPERATIONALLY CHECK AN/ARC-171 UHF RECEIVER-TRANSMITTERS	88
A20	PLAN OR SCHEDULE WORK ASSIGNMENTS	82
F147	PROCESS DIFM ITEMS	76

TABLE A5

REPRESENTATIVE TASKS PERFORMED BY
SUPERVISORY CLUSTER
(ST0021)

GROUP SIZE: 24
PREDOMINATE PAYGRADES: E6
PERCENT OF SAMPLE: 11%

AVERAGE TICF: 37 MONTHS
AVERAGE TAFMS: 163 MONTHS
AVERAGE # TASKS PERFORMED: 124

TASKS		PERCENT MEMBERS PERFORMING
C73	WRITE APRs	100
A8	DETERMINE WORK PRIORITIES	96
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	92
D92	MAINTAIN TRAINING RECORDS	92
B30	COUNSEL PERSONNEL	92
B50	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT TECHNICIANS (AFSC 45177)	88
B45	INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	88
C75	WRITE RECOMMENDATIONS FOR AWARDS AND DECORATIONS	88
D90	EVALUATE PROGRESS OF TRAINEES	83
A1	ASSIGN MAINTENANCE AND REPAIR WORK	83
E155	VERIFY MISSION CAPABILITY (MICAP) CONDITIONS	83
A21	PLAN OR SCHEDULE WORK PRIORITIES	79
E151	REVIEW AFTO FORMS 244 AND 245	79
A16	ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	79
A20	PLAN OR SCHEDULE WORK ASSIGNMENTS	79
C54	ANALYZE WORKLOAD REQUIREMENTS	75
D89	EVALUATE EFFECTIVENESS OF TRAINING PROGRAMS	75
C69	INSPECT SHOP MAINTENANCE ACTIONS	75
B39	IMPLEMENT SAFETY OR SECURITY PROGRAMS	75
E101	INITIATE OR REVIEW TECHNICAL ORDER SYSTEM FORMS, SUCH AS AFTO FORMS 22, 27, AND 32	75
B34	DIRECT SHOP MAINTENANCE ACTIVITIES	71
B49	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT SPECIALISTS (AFSC 45157)	71
E124	MANKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	71
D91	EVALUATE TRAINING METHODS AND TECHNIQUES	71
C67	INDORSE AIRMAN PERFORMANCE REPORTS (APR)	67
D93	MONITOR EFFECTIVENESS OF CAREER KNOWLEDGE, JOB PROFICIENCY, AND QUALIFICATION TRAINING PROGRAMS	67
E100	COMPILE DATA FOR REPORTS OR REQUISITIONS	63
E150	REVIEW AF FORMS 2413	63

TABLE A6

REPRESENTATIVE TASKS PERFORMED BY
SHIFT/PRODUCTION SUPERVISORS
(ST0042)

GROUP SIZE: 8
PREDOMINATE PAYGRADES: E5-E7
PERCENT OF SAMPLE: 4%

AVERAGE TICF: 35 MONTHS
AVERAGE TAFMS: 122 MONTHS
AVERAGE # TASKS PERFORMED: 192

TASKS		PERCENT MEMBERS PERFORMING
E143	PERFORM CORE AUTOMATED MAINTENANCE SYSTEM (CAMS) FUNCTIONS	100
E151	REVIEW AFTO FORMS 244 AND 245	100
B49	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT SPECIALISTS (AFSC 45157)	100
A1	ASSIGN MAINTENANCE AND REPAIR WORK	100
B48	SUPERVISE APPRENTICE B-1B AVIONICS TEST STATION AND COMPONENT SPECIALISTS (AFSC 45137)	100
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	100
D92	MAINTAIN TRAINING RECORDS	100
A8	DETERMINE WORK PRIORITIES	100
A20	PLAN OR SCHEDULE WORK ASSIGNMENTS	100
F177	REPAIR CABLE ASSEMBLIES, SUCH AS REPLACING PINS, WIRES, OR HARDWARE	100
E99	ATTACH OR ANNOTATE EQUIPMENT STATUS LABELS OR TAGS, SUCH AS DD FORMS 1574 (SERVICEABLE TAG - MATERIEL)	100
F172	PERFORM CORROSION CONTROL INSPECTIONS	100
E133	MAKE ENTRIES ON AFTO FORMS 350 (REPARABLE ITEM PROCESSING TAG)	100
C73	WRITE APRs	100
B50	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT TECHNICIANS (AFSC 45177)	88
A21	PLAN OR SCHEDULE WORK PRIORITIES	88
E101	INITIATE OR REVIEW TECHNICAL ORDER SYSTEM FORMS, SUCH AS AFTO FORMS 22, 27, AND 32	88
F164	INSPECT TEST EQUIPMENT	88
D90	EVALUATE PROGRESS OF TRAINEES	88
D78	ANNOTATE TRAINING RECORDS	88
E155	VERIFY MISSION CAPABILITY (MICAP) CONDITIONS	88
C69	INSPECT SHOP MAINTENANCE ACTIONS	88
D79	CONDUCT ON-THE-JOB TRAINING (OJT)	88
E124	MAKE ENTRIES ON AF FORMS 2413 (SUPPLY CONTROL LOG)	88

TABLE A7

REPRESENTATIVE TASKS PERFORMED BY
SHOP CHIEFS
(ST0050)

GROUP SIZE: 11
PREDOMINATE PAYGRADES: E6-E7
PERCENT OF SAMPLE: 5%

AVERAGE TICF: 40 MONTHS
AVERAGE TAFMS: 189 MONTHS
AVERAGE # TASKS PERFORMED: 109

TASKS		PERCENT MEMBERS PERFORMING
B34	DIRECT SHOP MAINTENANCE ACTIVITIES	100
B50	SUPERVISE B-1B AVIONICS TEST STATION AND COMPONENT TECHNICIANS (AFSC 45177)	100
A8	DETERMINE WORK PRIORITIES	100
C54	ANALYZE WORKLOAD REQUIREMENTS	100
B45	INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	100
D82	DETERMINE TRAINING REQUIREMENTS	100
C73	WRITE APRs	100
C75	WRITE RECOMMENDATIONS FOR AWARDS AND DECORATIONS	100
B39	IMPLEMENT SAFETY OR SECURITY PROGRAMS	100
B30	COUNSEL PERSONNEL	100
B35	DIRECT UTILITZATION OR MAINTENANCE OF EQUIPMENT	100
C62	EVALUATE SAFETY AND SECURITY PROGRAMS	100
B27	ADJUST DAILY MAINTENANCE PLANS TO MEET OPERATIONAL COMMITMENTS	91
A1	ASSIGN MAINTENANCE AND REPAIR WORK	91
D92	MAINTAIN TRAINING RECORDS	91
D91	EVALUATE TRAINING METHODS AND TECHNIQUES	91
A16	ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	91
D89	EVALUATE EFFECTIVENESS OF TRAINING PROGRAMS	91
A21	PLAN OR SCHEDULE WORK PRIORITIES	91
A5	COORDINATE MAINTENANCE WORK WITH APPROPRIATE PERSONNEL OR AGENCIES	91
D78	ANNOTATE TRAINING RECORDS	91
B40	IMPLEMENT SELF-INSPECTION PROGRAMS	91
A17	ESTABLISH WORK METHODS OR CONTROLS	91
F164	INSPECT TEST EQUIPMENT	91
A20	PLAN OR SCHEDULE WORK ASSIGNMENTS	91
D90	EVALUATE PROGRESS OF TRAINEES	82
C69	INSPECT SHOP MAINTENANCE ACTIONS	82
C66	IDENTIFY PROBLEM AREAS USING DEFICIENCY OR SERVICE REPORTS	82
E100	COMPILE DATA FOR REPORTS OR REQUISITIONS	73

TABLE A8

REPRESENTATIVE TASKS PERFORMED BY
TRAINING INSTRUCTOR IJT
(ST0022)

GROUP SIZE: 13
PREDOMINATE PAYGRADES: E5
PERCENT OF SAMPLE: 6%

AVERAGE TICF: 35 MONTHS
AVERAGE TAFMS: 125 MONTHS
AVERAGE # TASKS PERFORMED: 39

TASKS		PERCENT MEMBERS PERFORMING
D80	CONDUCT RESIDENT COURSE CLASSROOM TRAINING	100
D98	WRITE TEST QUESTIONS	100
D77	ADMINISTER TESTS	92
D97	SCORE TESTS	92
D86	DEVELOP RESIDENT COURSE TRAINING MATERIALS	92
J238	PERFORM CONFIDENCE TEST OF DAV TEST STATIONS	85
D85	DEVELOP PERFORMANCE TESTS	77
D90	EVALUATE PROGRESS OF TRAINEES	77
K252	PERFORM CONFIDENCE TEST OF RF TEST STATIONS	77
J239	PERFORM DIAGNOSTIC TEST OF DAV TEST STATIONS	77
K252	PERFORM CONFIDENCE TEST OF DIG TEST STATIONS	77
K253	PERFORM DIAGNOSTIC TEST OF RF TEST STATIONS	77
I229	PERFORM DIAGNOSTIC TEST OF DIG TEST STATIONS	77
E130	MAKE ENTRIES ON AFTO FORMS 244 AND 245	69
F169	LOAD CONTROL AND SUPPORT SOFTWARE	69
F165	INTERPRET DIAGRAMS, SUCH AS SYSTEM, SCHEMATIC, AND FAULT ISOLATION	62
E101	INITIATE OR REVIEW TECHNICAL ORDER SYSTEM FORMS, SUCH AS AFTO FORMS 22, 27, AND 32	62
J234	ADJUST DIGITAL ANALOG VIDEO (DAV) TEST STATIONS	62
D87	DIRECT OR IMPLEMENT TRAINING PROGRAMS	54
K248	ADJUST RADIO FREQUENCY (RF) TEST STATIONS	54

APPENDIX B

AFSC 451X7 ELECTRONIC FUNDAMENTALS/APPLICATIONS STS ELEMENTS
WITH KNOWLEDGE OR PERFORMANCE CODES AND LESS THAN
20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

APPENDIX B

AFSC 451X7 ELECTRONIC FUNDAMENTALS/APPLICATIONS STS ELEMENTS
WITH KNOWLEDGE OR PERFORMANCE CODES AND LESS THAN
20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

D T Y	Tsk Nbr	Task Title	451X7 (N=34)
0052	13c.	Troubleshoot AC generators -	
A59	A2-15	Do you troubleshoot AC generator component parts	18
0054	14a.	Alternators - Theory of operation -	
A61	A2-17	Do you trace schematic or block diagrams of circuits containing alternators	6
A64	A2-20	Do you perform tasks on component parts of alternators	3
0055	14b.	Isolate faulty alternators -	
A62	A2-18	Do you troubleshoot circuits to isolate a faulty alternator	3
0056	14c.	Troubleshoot alternators -	
A63	A2-19	Do you troubleshoot alternator component parts	3
0089	23c.	Electron Tube Specifications -	
A123	A4-4	Do you use electron tube characteristic curves	6
A124	A4-5	Do you use electron tube substitution manuals or charts	6
0108	27f.	Field strength tester -	
B187	B4-3	Do you use field strength testers	15

APPENDIX B

AFSC 451X7 ELECTRONIC FUNDAMENTALS/APPLICATIONS STS ELEMENTS
WITH KNOWLEDGE OR PERFORMANCE CODES AND LESS THAN
20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

D T Tsk Y Nbr	Task Title	451X7 (N=34)
0115	27m. Tube tester -	
B194	B4-10 Do you use tube testers	15
0127	29. Electron Tube Amplifiers - Theory of operation -	
C234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	9
C235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	6
C239	C4-6 Do you adjust or align electron tube amplifiers	6
C241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	3
C242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	6
C243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	6
C244	C4-11 Do you perform tasks on audio electron tube amplifiers	6
C245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	6
C246	C4-13 Do you perform tasks on common grid electron tube amplifiers	6
C247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	6
C248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	6
0129	29b. Isolate faulty tube amplifiers -	
C236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	9
C240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	6

APPENDIX B

AFSC 451X7 ELECTRONIC FUNDAMENTALS/APPLICATIONS STS ELEMENTS
WITH KNOWLEDGE OR PERFORMANCE CODES AND LESS THAN
20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

DT Tsk Y Nbr	Task Title	451X7 (N=34)
0130	29c. Troubleshoot electron tube amplifiers -	
C237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	6
C233	C4-5 Do you troubleshoot electron tube amplifier distortion	6
0134	31. Magnetic Amplifiers - Theory of operation -	
C265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	12
C266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	9
C269	C6-5 Do you adjust magnetic amplifiers or components	6
0136	31b. Isolate faulty magnetic amplifiers -	
C267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	6
0137	31c. Troubleshoot magnetic amplifiers -	
C268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	9

APPENDIX B

AFSC 451X7 ELECTRONIC FUNDAMENTALS/APPLICATIONS STS ELEMENTS
WITH KNOWLEDGE OR PERFORMANCE CODES AND LESS THAN
20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

DT Tsk Y Nbr	Task Title	451X7 (N=34)
0138	32. Saturable Reactors - Theory of operation -	
C270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	6
C271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	6
C274	C6-10 Do you adjust saturable reactor circuits or components	6
0140	32b. Isolate faulty saturable reactors -	
C272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	6
0141	32c. Troubleshoot saturable reactors -	
C273	C6-9 Do you troubleshoot saturable reactors to circuit level components	6
D302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	35
0151	34c. Troubleshoot power supply voltage regulators -	
D302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	35

APPENDIX B

AFSC 451X7 ELECTRONIC FUNDAMENTALS/APPLICATIONS STS ELEMENTS
WITH KNOWLEDGE OR PERFORMANCE CODES AND LESS THAN
20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

D T Tsk Y Nbr	Task Title		451X7 (N=34)
0156	35d.	Resistive/Capacitive/Inductive (RCL) Circuits B	
E314	E1-5	Do you calculate values of impedance, voltage, or current in RCL circuits	9
E315	E1-6	Do you calculate phase angle of RCL circuits	9
E316	E1-7	Do you calculate values of power in RCL circuits	9
0160	36c.	Troubleshoot Frequency Sensitive Filters 2b	
E319	E2-3	Do you troubleshoot frequency sensitive filters to circuit level components	18
0161	36d.	Calculations on Frequency Sensitive Filters -	
E321	E2-5	Do you calculate capacitance or inductance values for specific frequency sensitive filters	12
0172	38c.	Troubleshoot Limiter Circuits 2b	
F378	F4-6	Do you troubleshoot limiters to circuit level components	15
0176	39c.	Troubleshoot Clamper Circuits 2b	
F380	F4-8	Do you troubleshoot clampers to circuit level components	15

APPENDIX B

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20 PERCENT MEMBERS RESPONDING "YES"
(Survey respondents represent 5- and 7-skill level personnel)

D T Y	Tsk Nbr	Task Title		451X7 (N=34)
0208	45c.	Troubleshoot Logic Circuits	-	
G490	G3-3	Do you troubleshoot counters to circuit level components		12
G500	G3-13	Do you troubleshoot registers to circuit level components		15
G505	G3-18	Do you troubleshoot combinational logic circuits to circuit level components		15
0215	47c.	Calculations on transmission lines	-	
H529	H1-6	Do you calculate the characteristic impedance (ZO) of transmission lines		12
0226	50b.	Isolate faulty resonant cavities	2b	
H554	H3-2	Do you troubleshoot circuits to isolate a faulty resonant cavity		15
H557	H3-5	Do you measure frequency of resonant cavities		15
0227	50c.	Tune/adjust resonant cavities	2b	
H555	H3-3	Do you tune or adjust resonant cavities electrically		18
H556	H3-4	Do you tune or adjust resonant cavities physically		15

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D T Y	Tsk Nbr	Task Title	451X7 (N=34)
0232	51a(3).	Single Side Band transmitters Theory of operation -	
H 578	H4-18	Do you trace block diagrams of single side band (SSB) transmitters	18
H 579	H4-19	Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	18
H 580	H4-20	Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	18
H 584	H4-24	Do you align or adjust SSB transmitters or circuits	18
H 585	H4-25	Do you calculate percentage of modulation for SSB transmitters	9
0240	52a(3).	Single Side Band receivers Theory of operation -	
H 586	H4-26	Do you trace block diagrams of SSB receivers	18
H 587	H4-27	Do you trace block diagrams of SSB receiver subassemblies or circuit cards	18
H 588	H4-28	Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	18
H 592	H4-32	Do you align or adjust SSB receivers or circuits	18
0251	55.	Microphones - Theory of operation -	
J 668	J1-1	Do you trace block diagrams of circuits containing microphones	3
J 669	J1-2	Do you trace schematic diagrams of microphone circuits	3
J 672	J1-5	Do you work on carbon microphones	3
J 673	J1-6	Do you work on capacitor microphones	3
J 674	J1-7	Do you work on crystal microphones	0
J 675	J1-8	Do you work on dynamic microphones	6
J 676	J1-9	Do you work on velocity ribbon microphones	0

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D T Y	Tsk Nbr	Task Title		451X7 (N=34)
0253	55b.	Isolate faulty microphones	-	
J670	J1-3	Do you troubleshoot to isolate a faulty microphone		6
0254	55c.	Troubleshoot circuits	-	
J671	J1-4	Do you troubleshoot microphones		3
0255	56.	Speakers - Theory of operation	-	
J677	J1-10	Do you trace block diagrams of circuits containing speakers		6
J678	J1-11	Do you trace schematic diagrams of speaker circuits		3
0257	56b.	Isolate faulty speakers	-	
J679	J1-12	Do you troubleshoot to isolate a faulty speaker		3
0258	56c.	Troubleshoot speakers	-	
J680	J1-13	Do you troubleshoot speakers		3
0261	57b.	Isolate faulty photosensitive devices	2b	
J683	J2-3	Do you troubleshoot to isolate a faulty photo-sensitive device		9

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D T Y	Tsk Nbr	Task Title	451X7 (N=34)
0262	58.	Display Tubes - Theory of operation -	
J690	J3-1	Do you trace block diagrams of circuits containing display tubes	0
J691	J3-2	Do you trace schematic diagrams of display tubes or circuits	0
J693	J3-4	Do you adjust or calibrate display tubes or circuits	0
J694	J3-5	Do you work on direct view storage tubes (DVST)	0
J695	J3-6	Do you work on multiple mode storage tubes (MMST)	0
J696	J3-7	Do you work on scan converter tubes (SCT)	0
0264	58b.	Isolate faulty display tubes -	
J692	J3-3	Do you troubleshoot to isolate a faulty display tube	0