

Air Education and Training Command

Sustaining the Combat Capability of America's Air Force



Occupational Survey Report

AFSC 2A3X1

**A-10/F-15/U-2
AVONICS SYSTEMS**

U.S. AIR FORCE

Dr. Burke Burrigh
10 July 03

Integrity - Service - Excellence

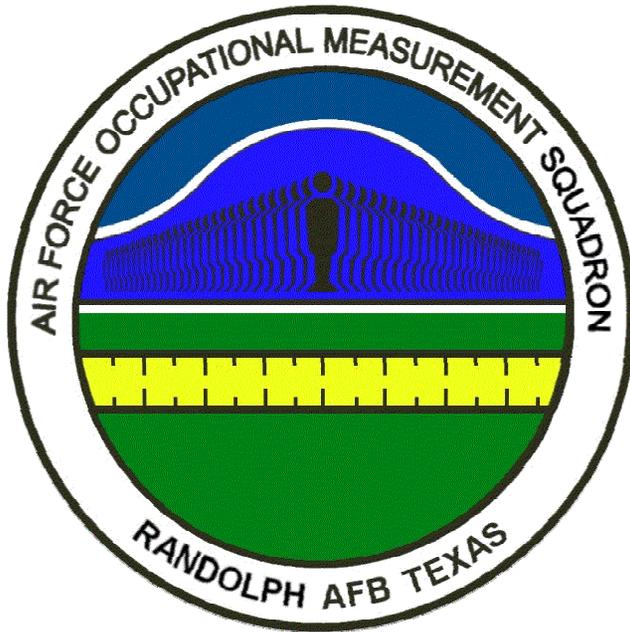
Report Documentation Page

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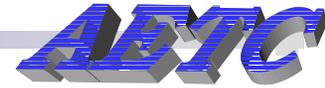
Overview



- Survey background
- Survey results
- Implications



Work Performed



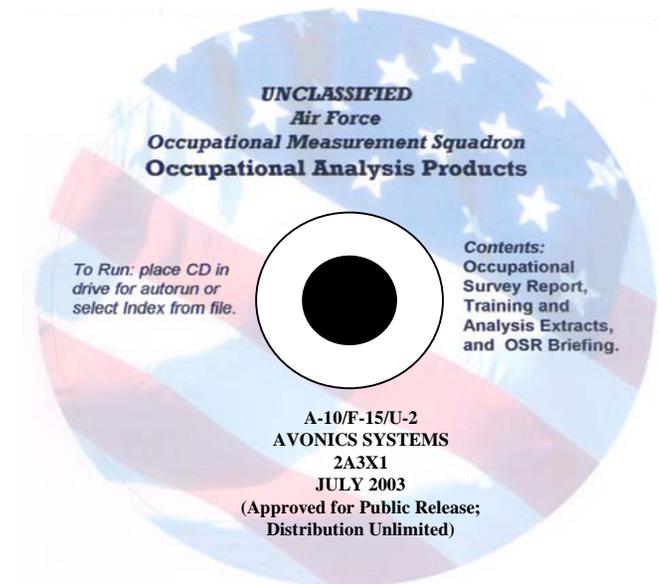
- Isolate malfunctions, repair, and inspect A-10, F-15, and U-2 integrated avionics systems at organizational levels
- Inspect, service, and perform general aircraft handling procedures



Survey Background



- Last occupational survey report (OSR):
June 1996
- Current survey developed: March - June 2002
 - Sheppard AFB TX (Tech School)
 - Nellis AFB NV
 - Beale AFB CA
 - Barnes ANGB MA
 - Otis ANGB MA

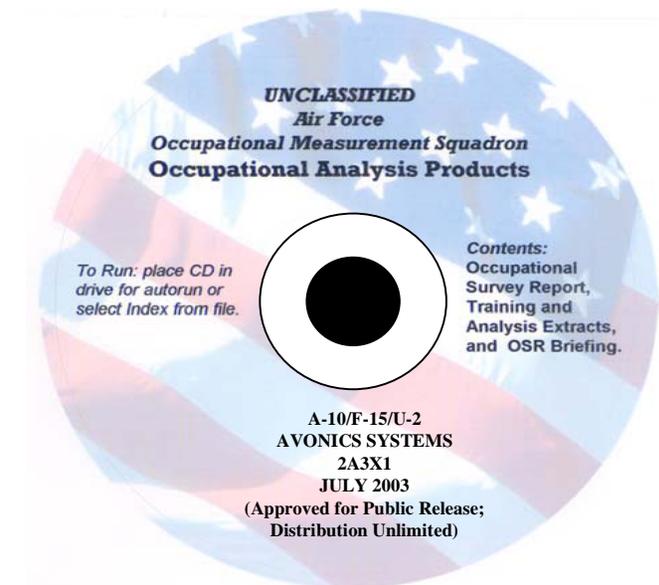




Survey Background



- Survey initiated to obtain data to:
 - Evaluate current classification and training documents
 - Support promotion test development
- Current survey data collected: July – November 2002
- Components surveyed:
 - Active Duty: 3-, 5-, and 7-skill levels
 - Guard: 5- and 7-skill levels





Classification Scheme by Shred



- Career ladder shredded out at 3- and 5-skill levels
 - Shred A: Avionics Attack Control Systems
 - Shred B: Avionics Instrument and Flight Control Systems
 - Shred C: Avionics Communications, Navigation, and Penetration Aids Systems
- Drop shreds at 7-skill level



Current Training Program



- Electronic Principles at Keesler AFB, MS
- AFSC-awarding courses
 - Six AFSC-awarding courses
 - All at Sheppard AFB, TX
 - 17 to 27 semester hours for CCAF

– Programmed TPR

03: 275 students

04: 358 students

Programmed Elimination Rate

03: 4%

04: 4%



Current Training Program



- Six AFSC-awarding courses

- J3ABR2A331A 003: *F-15 Avionics Attack Control Systems Apprentice* (13 weeks and 1 day)
- J3ABR2A331B 003: *F-15 Avionics Instrument and Flight Control Systems Apprentice* (15 weeks and 3 days)
- J3ABR2A331C 003: *F-15 Avionics Communication, Navigation, and Penetration Aids Systems Apprentice* (15 weeks and 3 days)
- J3ABR2A331A 004: *A-10 (MRA) Avionic Attack and Control Systems Apprentice* (10 weeks and 2 days)
- J3ABR2A331B 004: *A-10 (MRA) Avionic Instrument and Flight Control Systems Apprentice* (14 weeks and 3 days)
- J3ABR2A331C 004: *A-10 (MRA) Avionic Communication, Navigation, and Penetration Aids Systems Apprentice* (15 weeks)

Note: Airmen preparing to work on U-2 go through A-10 courses



Survey Sample Characteristics



	<u>AD</u>	<u>ANG</u>	<u>Total</u>
Assigned*	1,334	188	1,522
Eligible	1,115	158	1,273
Sample	644	80	724
Usable Returns	58%	51%	57%

- **Average time in career field for AD: 7 yrs 3 months**
- **Average TAFMS for AD: 7 yrs 9 months**
- **Percent of AD in first enlistment: 36%**

* Assigned as of June 2002



Skill & Paygrade Characteristics



Skill-Level Distribution

	Assigned*	Sample
3-Level	29%	27%
5-Level	46%	51%
7-Level	25%	22%

Paygrade Distribution

	Assigned*	Sample
E-1 - E-3	19%	17%
E-4	25%	25%
E-5	29%	34%
E-6	16%	19%
E-7	11%	5%

* Assigned as of June 2002



Command Representation



Command	Assigned %*	Sample %
ACC	43	41
PACAF	16	20
AETC	13	11
USAFE	10	12
AFMC	5	5
ANG	12	11
OTHER	1	0



* Assigned as of June 2002

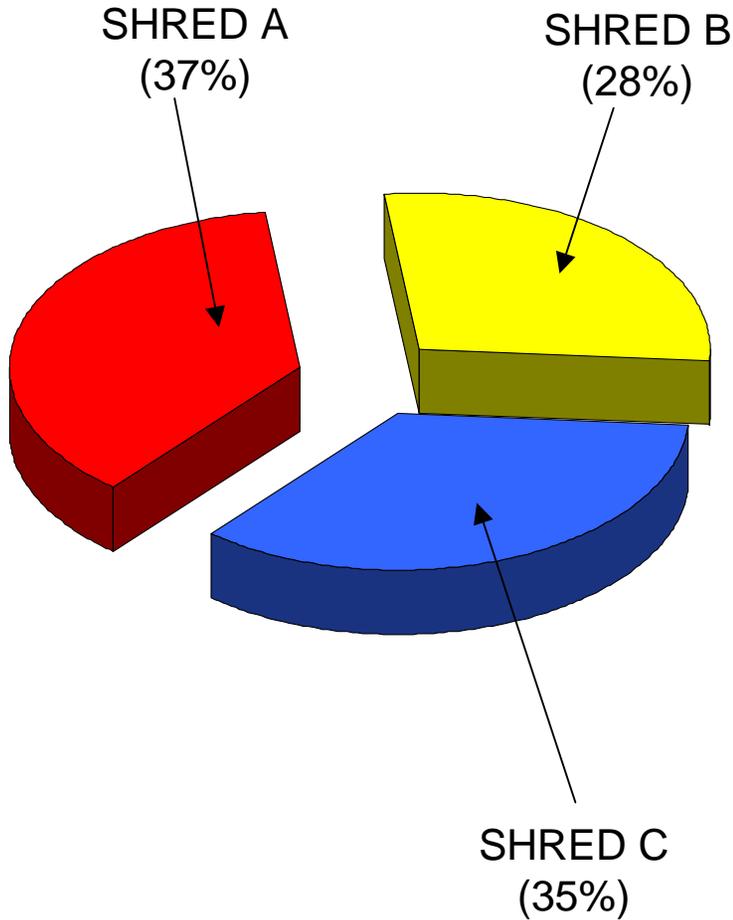


AFSC 2A3X1 Shred Structure

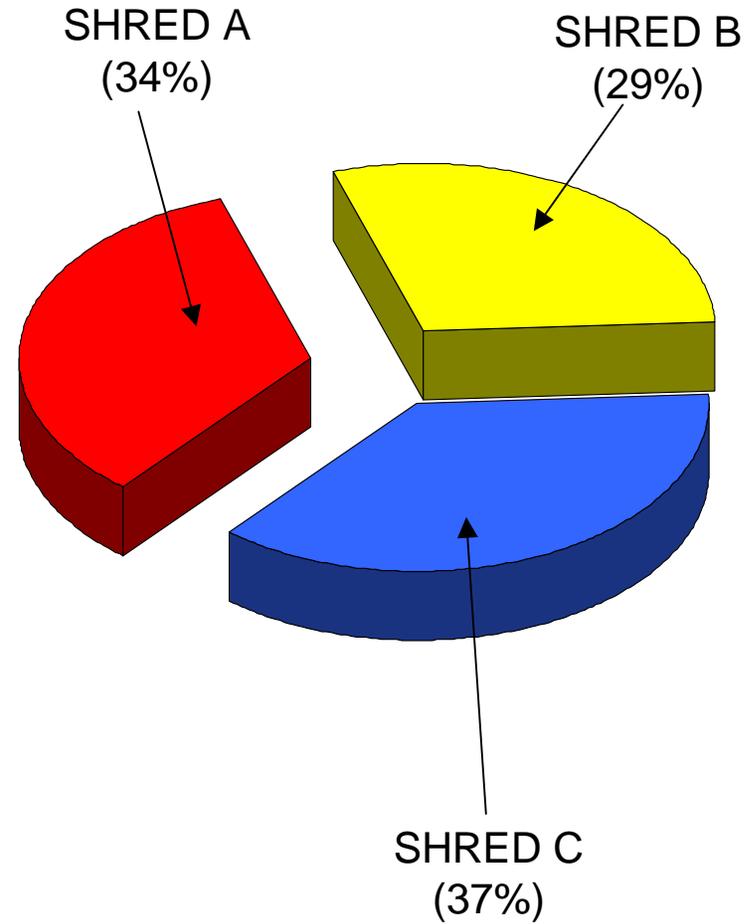
3- and 5-Skill Levels



Total Population



Sample



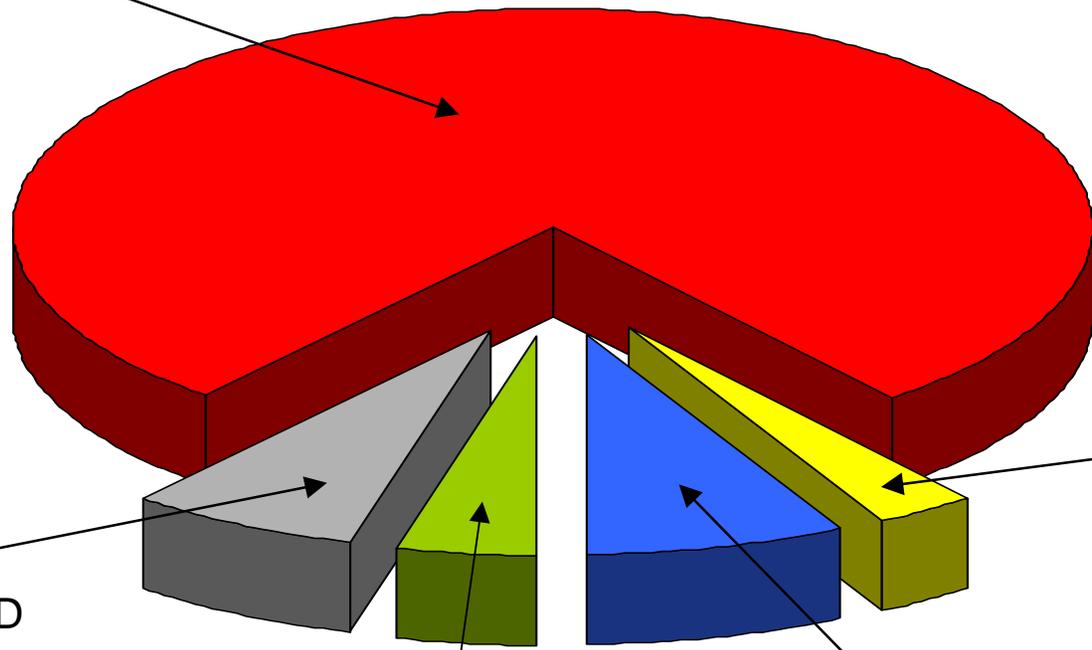


AFSC 2A3X1 Career Ladder Job Structure



(N = 724)

FLIGHTLINE CLUSTER
(78%)



TRAINING CLUSTER
(3%)

NOT GROUPED
(7%)

MANAGEMENT &
SUPERVISORY
CLUSTER
(8%)

*Independent Jobs (IJs)
Debriefer IJ
Schedule Control IJ
Equipment Control IJ
Deployment Management IJ

INDEPENDENT
JOBS* (4%)

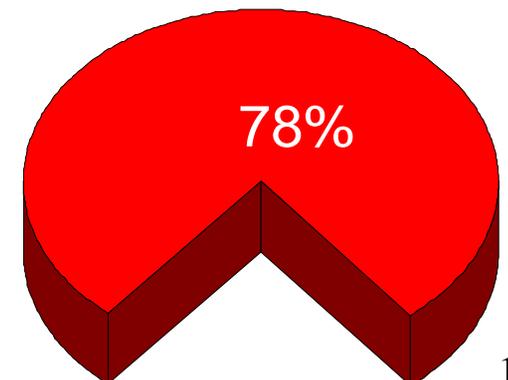


Flightline Cluster (N=562)



- Troubleshoot aircraft wiring
- Safety wire components
- Repair aircraft wiring
- Trace wiring, system, or interface diagrams
- Inspect aircraft wiring
- Troubleshoot multipin connectors
- Inspect chafing problem areas
- Troubleshoot coaxial cables and connectors

Wiring and Cable Job	U-2 Electronic Warfare Job
F-15 Attack Control Systems Job	Communications, Navigation, and Penetration Aids Job
F-15 Flight Control Job	U-2 Flight Control Job
F-15 Mid-Career Generalist Job	U-2 Communications Job
A-10 Mid-Career Generalist Job	



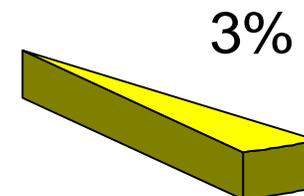


Training Cluster (N=21)



- Conduct formal course classroom training
- Personalize lesson plans
- Counsel trainees on training progress
- Evaluate progress of trainees
- Administer or score tests
- Trace wiring, system, or interface diagrams
- Maintain training records or files
- Conduct CAMS training

Technical School Instruction Job
Continuation Training Instruction Job



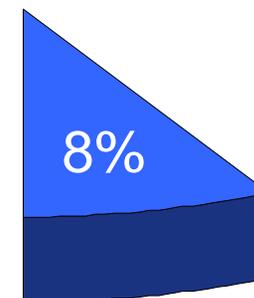


Management and Supervision Cluster (N=58)



- Evaluate personnel for compliance with performance standards
- Conduct on-the-job training (OJT)
- Counsel subordinates concerning personal matters
- Inspect personnel for compliance with military standards
- Conduct supervisory performance feedback sessions
- Interpret policies, directives, or procedures for subordinates
- Write or indorse military performance reports

Expeditor Job
Quality Control Job
Flightline NCOIC Job
Non-Flightline NCOIC Job





Independent Jobs



- Debriefer IJ (N=10)
 - Debrief aircrews
 - Analyze computerized-fault reporting system (CFRS) data
 - Update and maintain CFRS data
- Schedule Control IJ (N=6)
 - Determine or establish work assignments or priorities
 - Adjust daily maintenance plans to meet operational commitments
 - Maintain or update status indicators, such as boards, graphs, or charts



Independent Jobs (Cont.)



- Equipment Control IJ (N=7)
 - Issue or log turn-ins of equipment, tools, parts, or supplies
 - Inventory equipment, tools, parts, or supplies
 - Pick up, deliver, or store equipment, tools, parts or supplies
- Deployment Management IJ (N=6)
 - Coordinate mobility or contingency requirements with appropriate agencies
 - Request or distribute mobility requirement documents
 - Assign personnel to mobility or contingency positions



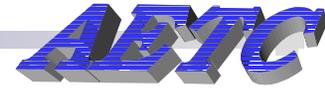
Career Ladder Progression



- 3- and 5-skill levels
 - Most work in Flightline Cluster
 - 5-skill-level personnel have broader jobs
 - A few 5-skill-level personnel move into niche and management jobs
- 7-skill level
 - A majority continue to perform technical tasks
 - Approx. one-fourth of 7-skill-level personnel in management and supervision jobs



Percent Across Specialty Jobs DAFSC



<u>Specialty Jobs</u>	DAFSC 2A331 (N=198)	DAFSC 2A351 (N=367)	DAFSC 2A371 (N=159)
Flightline Cluster	90	82	52
Training Cluster	0	5	1
Debriefing IJ	*	2	2
Management and Supervision Cluster	0	4	28
Schedule Control IJ	0	*	3
Equipment Control IJ	2	1	0
Deployment Management IJ	0	0	4
Not Grouped	8	6	10

* Indicates less than 1%



Career Ladder Progression Percent Time Spent on Duties



<u>Duties</u>	DAFSC 2A331 (N=198)	DAFSC 2A351 (N=367)	DAFSC 2A371 (N=159)
A. Performing General Avionic Systems Maintenance Activities	20	16	11
B. Maintaining Attack Control Systems	18	16	9
C. Maintaining Instrument and Flight Control Systems	23	18	13
D. Maintaining Communications, Navigation, and Penetration Aids Systems	18	17	10
E. Performing General Aircraft Handling or CUT Activities	10	7	5
F. Performing Maintenance Management Activities	5	6	8
G. Performing General Administration and Technical Order (TO) System Activities	2	4	8
H. Performing General Supply and Equipment Activities	2	3	4
I. Performing Mobility and Contingency Activities	*	2	5
J. Performing Training Activities	*	5	8
K. Performing Management and Supervisory Activities	*	6	19

•Indicates less than 1%

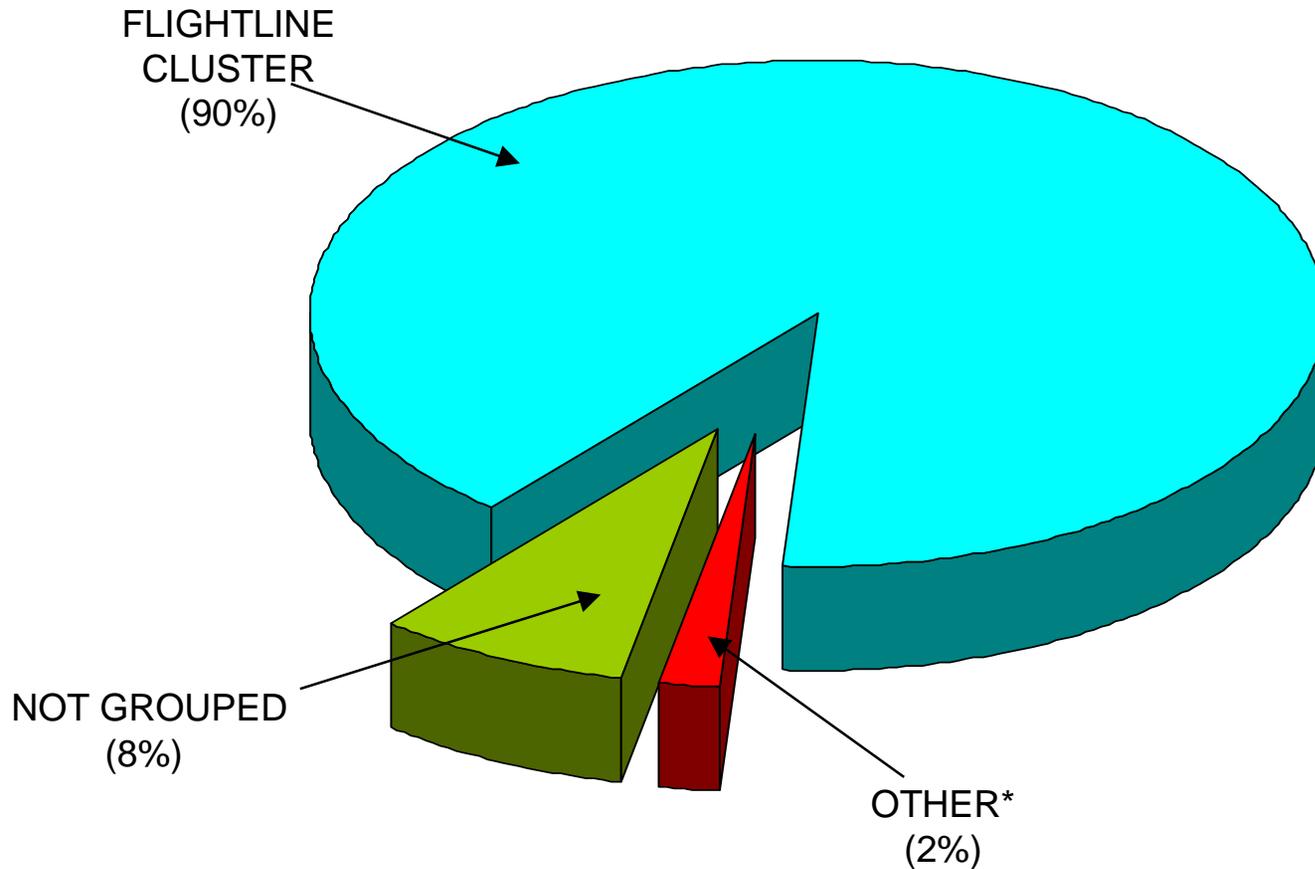
Note: Columns may not add to 100% due to rounding



First-Enlistment Job Structure



(N = 254)



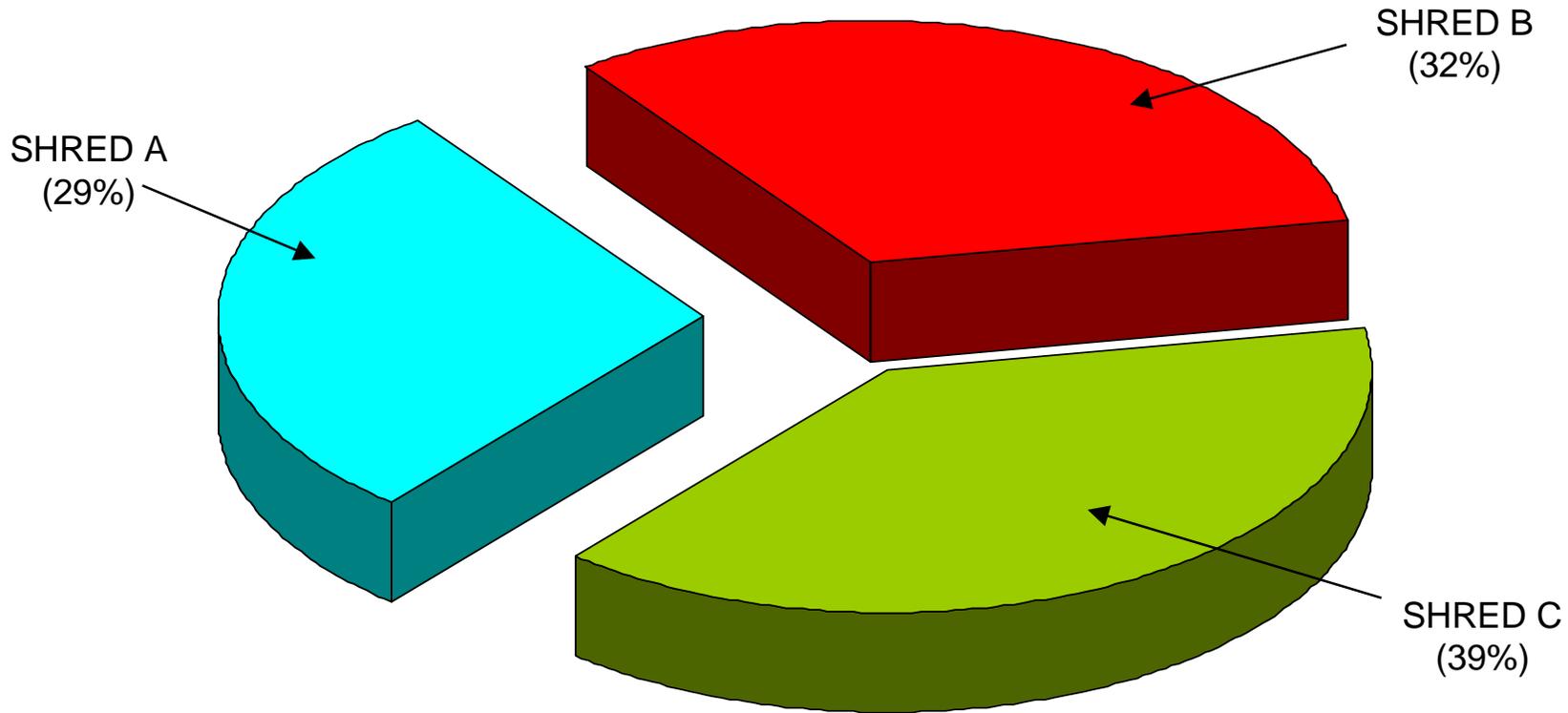
*OTHER includes:
Debriefer IJ
Equipment Control IJ



First-Enlistment Group by Shreds



(N = 254)





First-Enlistment Personnel Representative Tasks



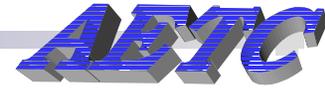
Percent
Members
Performing
(N=254)

Tasks

Troubleshoot aircraft wiring	92
Safety wire components	89
Trace wiring, system, or interface diagrams	87
Inspect aircraft wiring	86
Repair aircraft wiring	86
Troubleshoot multipin connector	84
Inspect chafing problem areas	82
Inspect coaxial cables and connectors	80
Remove, replace, or repair multipin connectors	79
Inspect multipin connectors	78
Repair chafed areas	77
Troubleshoot coaxial cables and connectors	76
Update and maintain CAMS data	75
Remove, replace, or repair coaxial connectors	73



Specialty Training Standard (STS) Analysis



- Evaluated four of five sections of STS
 - Each section evaluated with shred- and aircraft-specific data
 - Did not evaluate electronics principles section of STS
- STS is generally supported by survey data
 - Seven STS items were unsupported
- Many technical tasks from Duty A were performed by 20% or more of members but not referenced to in the four evaluated sections of the STS
 - Review electronics principles section of STS for possible references



Unsupported STS Elements



Examples

Unit	Learning Objective	Prof Code	Percent Members Performing		TNG EMP*	TSK DIF**	ATI***
			1st ENL	3-LVL			
2.6.13.2	AF Form 2005 (SUPPLY DISCIPLINE)	2b					
Task	H0495 Initiate request for equipment, tools, parts, and supplies		19	17	1.08	5.03	2
3.20.5.1	LASTE Analysis (A-10 LOW ALTITUDE SAFETY TARGET ENHANCEMENT SYSTEM)	2b					
Task	B0135 Troubleshoot LASTE system		10	2	2.64	6.11	2
4.27.4	Isolate malfunctions (A-10 TURBINE ENGINE MONITORING SYSTEM)	-					
Task	C0284 Troubleshoot TEMS		10	4	2.02	5.56	2
5.26.3	Perform operational checkout (A-10 LIGHTWEIGHT AIRBORNE RECOVERY SYSTEM)	-					
Task	D0367 Troubleshoot LARS		7	10	2.19	5.10	2

*Mean TE Rating is 2.96, Standard Deviation is 1.65 (HIGH TE > 4.61)
 **Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD > 6.00)
 ***ATI (Automatic Training Indicator) is training decision value for residential training (18 = HIGH; 1 = LOW)



Tasks not Referenced to STS



Examples

<u>Tasks</u>	Percent Members Performing				<u>ATI***</u>
	<u>1st</u>	<u>3-</u>	<u>TNG</u>	<u>TSK</u>	
	<u>ENL</u>	<u>LVL</u>	<u>EMP*</u>	<u>DIF**</u>	
A0006 Inspect aircraft wiring	85	84	5.86	5.34	18
A0010 Inspect multipin connectors	77	75	5.08	4.65	18
A0039 Troubleshoot coaxial cables	90	89	5.72	6.98	18
A0041 Troubleshoot multipin connectors	82	79	5.81	7.07	18

*Mean TE Rating is 2.96, Standard Deviation is 1.65 (HIGH TE > 4.61)

**Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD > 6.00)

***ATI (Automatic Training Indicator) is training decision value for residential training (18 = HIGH; 1 = LOW)



Plan of Instruction (POI) Analysis



- Learning objectives involving safety practices and ordering LRUs not well supported in most POIs
- Tech school review non-referenced tasks from Duty A to ensure they are taught in the *Electronic Principles* course
- Tasks from corresponding Duty Areas with high ATIs are not referenced to learning objectives in five of six POIs
 - Duties B, C, and D correspond to Shreds A, B, and C, respectively
 - Only the *F-15 Avionics Attack Control Systems Apprentice* course provides nearly full coverage of corresponding Duty Area



Unsupported POI Objectives



Examples

Tasks	Percent Members Performing		TNG EMP*	TSK DIF**	ATI***
	1 st ENL	3- LVL			
I.5.e Given Work Unit Code Manual and a scenario, complete AF Form 2005 for ordering LRUs with no more than one instructor assist					
H0415 Initiate requisition for equipment, tools, or supplies	13	9	1.08	4.40	2
IV.5.a Using applicable TOs, and an A-10 aircraft, perform the exterior and interior maintenance ground safety checks with no more than two instructor assists					
E0388 Inspect aircraft landing gear systems	3	7	1.03	4.72	2
E0390 Inspect halon bottles	3	0	3.42	3.16	3
E0408 Perform operational checks of aircraft seat adjustment system	3	0	0.61	3.39	1

*Mean TE Rating is 2.96, Standard Deviation is 1.65 (HIGH TE > 4.61)

**Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD > 6.00)

***ATI (Automatic Training Indicator) is training decision value for residential training (18 = HIGH; 1 = LOW)



Tasks not Referenced to POIs



Examples

<u>Tasks</u>	Percent Members Performing		TNG	TSK	ATI***
	<u>1st</u>	<u>3-</u>			
	<u>ENL</u>	<u>LVL</u>	<u>EMP*</u>	<u>DIF**</u>	
B0074 Operationally check overload warning systems (OWSs)	79	80	5.36	5.70	18
B0128 Troubleshoot HUD systems	89	100	4.75	5.48	18
C0254 Troubleshoot control stick grips	83	83	5.33	5.68	18
C0245 Troubleshoot AFCSSs	65	67	5.19	6.76	18
D0359 Troubleshoot FDLs	60	65	4.69	6.36	18
D0304 Operationally or BIT check EWW systems	66	53	5.19	5.01	18

*Mean TE Rating is 2.96, Standard Deviation is 1.65 (HIGH TE > 4.61)

**Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD > 6.00)

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Job Satisfaction Indicators (AFSC 2A3X1 vs. Comparative Sample)

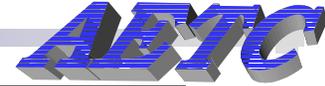


	1-48 Months		49-96 Months		97+ Months	
	2003 2A3X1 (N=254)	Comp Sample* (N=1,592)	2003 2A3X1 (N=140)	Comp Sample* (N=714)	2003 2A3X1 (N=245)	Comp Sample* (N=2,191)
Job interesting	65	67	66	68	75	76
Talents well utilized	79	79	82	78	87	86
Training well utilized	86	90	90	89	83	84
Sense of accomplishment	63	69	64	68	66	84
Plan to reenlist	42	51	61	62	65	64

* Comparative sample of AFSCs surveyed in the last 24 months includes: Aerospace Maintenance (AFSC 2A5X1), Helicopter Maintenance (AFSC 2A5X2), Nondestructive Inspection (AFSC 2A7X2), and Survival Equipment (AFSC 2A7X4).



Job Satisfaction Indicators (Current vs. Previous Study)



	1-48 Months		49-96 Months		97+ Months	
	2003 (N=254)	1996 (N=455)	2003 (N=140)	1996 (N=227)	2003 (N=245)	1996 (N=503)
Job interesting	65	83	66	75	75	72
Talents well utilized	79	83	72	82	87	83
Training well utilized	86	90	90	88	83	78
Sense of accomplishment	63	75	64	72	66	69
Plan to reenlist	42	56	61	71	65	73



Job Satisfaction Indicators Across Specialty Jobs



	FLIGHTLINE CLUSTER (N=562)	TRAINING CLUSTER (N=21)	DEBRIEFER IJ (N=10)	MNGMT & SUPERV. CLUSTER (N=58)
Job interesting	72	57	80	69
Talents well utilized	85	86	100	81
Training well utilized	90	86	100	75
Sense of accomplishment	68	67	90	53
Plan to reenlist	59	76	50	41



Job Satisfaction Indicators Across Specialty Jobs (cont.)



	SCHEDULE CONTROL IJ (N=6)	EQUIPMENT CONTROL IJ (N=7)	DEPLOYMENT MGMT. IJ (N=6)
Job interesting	100	14	83
Talents well utilized	100	28	67
Training well utilized	83	14	67
Sense of accomplishment	100	29	67
Plan to reenlist	100	57	67



Retention Dimensions First-Term Airmen (N=254)



	Percent Responding	Average
Planning to Reenlist (N=106)		
Job security	74	2.49
Bonus or special pay	65	2.45
Retirement benefits	64	2.46
Medical/dental care for AD members	62	2.52
Military-related education & training opportunities	62	2.30
Planning to Separate (N=143)		
Military lifestyle	62	2.14
Pay and allowances	56	2.28
Unit manning	52	2.47
Work schedule	50	2.63
Recognition of efforts	50	2.25

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence



Retention Dimensions

Second-Term Airmen (N=140)

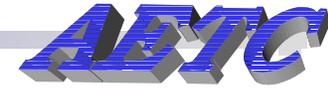


	Percent Responding	Average
Planning to Reenlist (N=85)		
Retirement benefits	65	2.65
Job security	62	2.62
Pay and allowances	53	2.29
Medical/dental care for family members	49	2.43
Medical/dental care for AD member	47	2.42
Planning to Separate (N=52)		
Work schedule	71	2.59
Pay and allowances	65	2.53
Unit manning	65	2.50
Military lifestyle	65	2.21
Esprit de corps/morale	58	2.33

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence



Retention Dimensions Career Airmen (N=245)



	Percent Responding	Average
Planning to Reenlist (N=159)		
Retirement benefits	75	2.62
Job security	60	2.56
Pay and allowances	52	2.45
Military lifestyle	47	2.37
Medical/dental care for AD member	46	2.45
Planning to Separate (N=30)		
Work schedule	70	2.64
Unit manning	65	2.54
Pay and allowances	50	2.30
Recognition of efforts	45	2.56
Bonus and special pay	45	2.11

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence



Summary of Results



- Specialty Jobs
 - 80% of personnel perform flightline maintenance
 - U-2 maintainers remain highly specialized
- Career ladder progression
 - Technical focus at 3-, 5-, and 7-skill levels
 - Jobs broaden as airmen gain experience
- Career ladder documents
 - STSs provide comprehensive coverage of work performed by career ladder
 - Five out of six 3-level AFSC-awarding courses should include more tasks
- Job satisfaction
 - Overall job satisfaction is positive
 - Decline in 1st and 2nd enlistment job satisfaction since 1996
 - Airmen in the Equipment Control IJ have very low job satisfaction
- Retention dimensions
 - Airmen stay for money and benefits
 - Airmen get out because the pay is not worth the long work hours



Questions?



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Sustaining the Combat Capability of America's Air Force



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