ENHANCEMENT OF THE U. S. ARMY AIRCREW COORDINATION TRAINING (ACT) PROGRAM

Neal Crossland, Training and Performance Support Systems
Gary Grubb, Center for Team Performance
Dynamics Research Corporation
Andover, Massachusetts

Abstract

The Aircrew Coordination Training Enhancement (ACTE) program is a continuation of the US Army Research Institute's (ARI) effort to promote applied research and development of the existing Army Aircrew Coordination Training (ACT) program. Following implementation of the initial Army ACT program in the mid-90's, field commanders and aircrews alike acknowledged the benefit of the mandatory, one-time training that was received by all aviators within the US Army aviation community. However, program funding did not provide a mechanism to effectively sustain high levels of aircrew coordination training. Additionally, experience and skill levels have decreased significantly because of diminished defense spending and concomitant reductions in personnel strength levels. The combination of these factors may have contributed directly to a reversal in Army aviation accident rates that had been declining since ACT implementation. The goal of the current ACT enhancement effort is to provide a capability for a web-delivery, interactive aircrew coordination training system that will provide Army aircrews worldwide with the knowledge, skill sets, and attitudes that will increase their safety of flight and mission effectiveness in daily operations.

This paper describes the ongoing training system research and development effort under the guidance of the US Army Research Institute. The research plan consists of three major phases – upgrade and sustain the existing ACT program, refresh and maintain the upgraded ACT program, and deploy advanced ACT applications. Central to the upgrade and sustainment phase is the process of designing and developing a prototype interactive computer-based instructional package that will be exported and evaluated for instructor-mediated training events. The instructional design employs state-of-the-art technology provided by programming software such as Macromedia Flash and Dreamweaver Ultra-Dev. The instructional approach includes refresher modules prerequisite to scenario-based case study modules that serve as the basis for facilitated discussions or "hangar talk" designed to instill and enhance effective crew coordination skills among aircrew members. An important part of the case study modules is the on-line evaluation of presented mishap scenarios in the form of a feedback histogram. The ability of facilitators and students to see performance variations in scenario situations serves as a trigger for discussion and internalization of optimal team coordination behaviors. The long-term goal is to provide ACT for consumption as a mission and aircraft specific training and performance evaluation system for use by unit instructors and individual aircrew members.

Primary Author's Biographical Sketch

Mr. Neal Crossland is the manager of Training and Performance Support Systems unit for Dynamics Research Corporation. He is the ACTE task lead for Aircrew and Instructor courses development and testing. He earned a BS in Occupational Education, Air University certification as an Academic Instructor, and a MBA and MS in Business Education. He is a licensed aviator.

Secondary Author's Biographical Sketch

Mr. Gary Grubb is the director of the Dynamics Research Corporation's Center for Team Performance and manages the ACTE program. He has published numerous team coordination research papers and has designed, developed, implemented and evaluated ACT/CRM programs for the Army and Air Force. A former Army aviator, he has a MS in Management.

ENHANCEMENT OF THE U. S. ARMY AIRCREW COORDINATION TRAINING (ACT) PROGRAM

Neal Crossland, Training and Performance Support Systems
Gary Grubb, Center for Team Performance
Dynamics Research Corporation
Andover, Massachusetts

INTRODUCTION

Aircrew Coordination Training (ACT) and Crew/Cockpit Resource Management (CRM) programs were instituted in the 1980's, first in commercial aviation and later in military aviation, to address adverse mishap rate trends that showed the inability of many aviators to work well together in periods of high stress or workload (Helmreich, Merritt, & Wilhelm, 1999). Minor aircraft malfunctions were resulting in fatal accidents with alarming regularity. While aviators generally displayed excellent knowledge and understanding of aircraft systems, operating procedures, rules and regulations and other technical information, they often displayed a glaring inability to communicate effectively, distribute workload, maintain or regain situational awareness and make sound decisions. Military aviation took note of the success of CRM in the civilian sector and instituted similar training programs (Orlady & Foushee, 1987).

ACT/CRM programs have been structured in various ways and continue to evolve as the perspective changes as to what constitutes effective team coordination training. Most programs include the following basic elements:

- A discussion of the core behaviors or basic skill sets that make up ACT. Each program structures these core behaviors differently, but all contain common elements.
- An examination of the applicability of ACT behaviors in the "real world." This typically takes the form of one or more case studies of real-world incidents or accidents and includes an analysis of where or when proper ACT behaviors could have been employed.
- Some type of role-playing or practice of ACT behaviors in a simulated mission setting, i.e., line-oriented flight training (LOFT) or its equivalent.
- Some form of assessment of the learning or changes in attitudes and behaviors that have taken place as a result of the training, and the evaluation of the training by the students.

This paper describes a current research and development initiative directed by the U. S. Army Research Institute (ARI) to enhance the Army's Aircrew Coordination Training program through upgraded training content and state of the art distributed learning technology.

DESCRIPTION OF THE INITIAL ARMY ACT PROGRAM

The U.S. Army implemented its version of Aircrew Coordination Training (ACT) in 1994 (Department of the Army, 1992). During fiscal years 1984-1989, crew coordination failures identified by the Army Safety Center directly contributed to the loss of 147 lives and $292 million in aviation accident costs. In 1990, Army leadership directed the Army Aviation Center to focus its aviation training and evaluation on crew performance.

Research and Development

The Army Research Institute (ARI) worked closely with Army aviation training, evaluation, and safety personnel to develop, validate, and field an ACT Exportable Training Package. Army ACT program performance methods and measures included:

- ACT behaviors or Basic Qualities evaluated with supporting behaviorally anchored rating scales.
- Aircrew Training Manual task performance.
- Mission performance of two flight simulator scenarios similar in difficulty in terms of time stress, navigational demands, quantity and capabilities of simulated threat.

Results of the Army ACT validation test showed significant improvement in aircrews' overall mission effectiveness between pre- and post-training evaluation scenarios.

- Overall mission effectiveness +20%
- Navigation accuracy +38%
- Mission objectives +44%

During the Army ACT validation test, all aircrews made errors in completing the complex, tactical simulator missions (Simon & Grubb, 1993). Pre- to post-training results improved markedly for navigation, instrument flight recovery, and mission-threatening error performance measures.

- Course deviations –45%
- Arrive at correct landing zone +38%
- No early descent below minimums +32%
- Manage mission threatening error +27%

Like the mission effectiveness increases, results of the Army ACT validation test showed significant improvement in aircrew flying safety between pre- and post-training evaluation scenarios.

- Unexpected weather recovery +25%
- Emergency detection +38%
- Number of aircraft crashes –43%

Instructor evaluators rated crew performance of the set of thirteen Army ACT behaviors (called Basic Qualities) during each testbed mission. There was improvement between the pre-training and post-training evaluations in every Basic Quality with statistically significant improvements on 12 of 13 Basic Qualities.

As a result of the initial ACT training program, Army aircrews learned behavioral skills and team coordination techniques that helped them to remain focused and ready to deal with emergencies and unforeseen problems so they do not lose sight of mission objectives.

Implementation

Crew coordination training provides the knowledge, skills, and attitudes to aircrews that increase their mission effectiveness, while decreasing the cockpit errors that contribute to accidents. Following the implementation of the initial Army ACT in the mid-nineties, the Class A aviation accident rate dramatically dropped (see Figure 1). Army ACT was presented as "one-time training" without annual continuation or sustainment training. Though other variables may have contributed to the decrease, the Class A aviation accident rate increased when ACT was no longer emphasized.

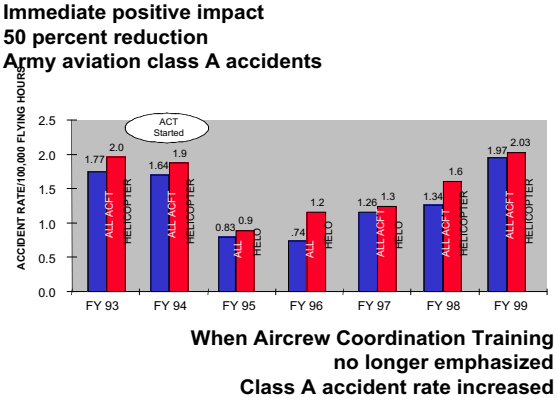

Figure 1. Impact on Accident Rate

Commanders and aircrews alike acknowledged the benefit of the mandatory, one-time training that was received by all aviators within the Army aviation community. The initial program did not address sustainment issues and did not package the training in a program that would facilitate such training. Therefore, sufficient funds were not provided for developing a program to sustain this important training. Funding issues notwithstanding, significant personnel turbulence associated with downsizing the force since the 1994 program inception has resulted in a natural erosion of the safety gains initially realized as a result of ACT. Finally, the atrophying of skills and the lowering of experience levels that has occurred during successive years of limited Defense funding have now manifested themselves in a sharp increase in accident and incident rates.

Lack of effective aircrew coordination continues to be cited as a definite or suspected contributing factor in aviation flight accidents, and it is a factor limiting attainment of the full mission effectiveness of Army aviation. For example, the Director of Army Safety reported in the December 1999 issue of *Flightfax*, "In fact, FY99 produced Army aviation's worst safety performance since Desert Shield/Desert Storm." The ACT program has not been updated since its original introduction. Currently, ACT is conducted in the classroom (Eight hours of instruction with a two-hour, 50 question, multiple-choice exam) with no follow on mandatory training periods in either aircraft

simulators or in the aircraft. Instructors responsible for evaluating and reinforcing this academic training receive four hours of academic training with no exam to determine competency. Temporary measures such as awareness videos, assistance visits, safety newsletter articles, and a web-based training support package have been ineffective substitutes for focused ACT training.

APPROACH TO REVITALIZE AND SUSTAIN ARMY ACT

The objective of the research effort to enhance Army ACT is to improve the crew and team coordination effectiveness of Army aircrews in their day-to-day mission planning and flight operations. This objective will be realized by establishing and maintaining a unit-level command climate that promotes the use of team coordination behaviors and places equal emphasis on technical and team coordination skills in daily flight operations. Instructor pilots and ACT facilitators in aviation units are key to the institutionalization of a successful ACT program.

The enhancement program managed by the ARI is a multi-year, multiphase program of applied research structured in three major phases – upgrade and sustain the existing ACT program, refresh and maintain the upgraded ACT program, and deploy advanced ACT applications. ARI's Rotary-Wing Aviation Research Unit convened a working group at Fort Rucker to provide guidance and oversight for Army Aircrew Coordination Training Enhancement (ACTE) program. The group is made up of key personnel from the US Army Aviation Center (USAAVNC) and other subject matter experts who serve as contributors to planning, developing, implementing or evaluating the program.

Phase I of the enhancement effort to upgrade and sustain the current ACT program is currently midway toward completion applying the following general approach:

- Analysis of the current aircrew coordination training program from a total systems perspective to identify conflicts, bottlenecks, and deficiencies in implementing team coordination in daily flying operations.
- Refinement of team evaluation techniques and tools for assessing overall performance along specific behavioral proficiency dimensions.
- Development of prototype focused interventions for training and evaluating team coordination behaviors and for managing risk.
- Validation of prototype team training and evaluation techniques in selected aviation units.
- Field-testing of prototype training, evaluation, and technology products.

When the phase I products are fully developed and deployed, the Aircrew Coordination Training Enhancement (ACTE) program will provide mission-oriented sustainment training and provision for web-accessible updates.

CURRENT ENHANCEMENT OF ACT

Establish a Master Plan for ACT Enhancement

In order to enhance ACT, several key tasks have to be performed sequentially. The now completed lead task was to establish a logical master plan that provides a business process for achieving the desired ACTE program end-state. Aircrew training programs currently provided by Army, other Department of Defense (DoD) agencies, and commercial air carriers were reviewed as benchmarks for the training and evaluation of aircrew and team coordination in both the institution and unit environments. Issues relevant to both rated and non-rated aircrew members in rotary wing and fixed wing environments were identified. Examined were insights and operational trend data provided by the aviation safety, standards and evaluation, and training communities. Special note was made of existing methodologies for measuring ACT and mission effectiveness. The goal of that inquiry was to provide a sound basis for the development of behaviorally anchored rating scales that are reliable, valid, and intuitive to the user.

Develop a Tool to Evaluate Aircrew Coordination Behaviors

The second task of this first phase of the ACTE effort was to develop and implement an evaluation methodology for measuring effective performance of aircrew coordination behaviors. The measurement of aircrew coordination behavior is a critical component of the aircrew coordination program and is central to the training content design and delivery. The product of this task is a set of observable measures of individual and collective behavior, the Behaviorally Anchored Rating System (BARS). A readily usable

evaluation tool that trainers and ACT facilitators will use to teach aircrew members how to apply the BARS as a fundamental means of evaluating aircrew and team performance of ACT behaviors and skills. The vehicle for documenting these evaluations is the ACT Performance Evaluation Checklist (see Attachment 1) which is based on the 5 Crew Coordination Objectives (CCO) and 13 Basic Qualities (BQ) accepted by the Army as descriptors of aircrew coordination behavior. ACT behaviors and skills are organized by CCO and are rated using a seven-point scale with values ranging from 1 (Below Standards) to 7 (Exceeds Standards). The BARS numeric rating scale is shown at the bottom of the ACT Performance Evaluation Checklist.

Below Standards			Meets Standards			Exceeds Standards
1	2	3	4	5	6	7

Figure 2. BARS Numeric Rating Scale

Written descriptions are provided for the ACT behaviors and skills and levels of performance for rating aircrews at the values of 1, 4, and 7. These descriptions serve as behavioral "anchors" and are designed to assist in determining how well an aircrew performs ACT behaviors and skills in relation to a well-defined set of performance criteria. The anchors are used as the standard for evaluating ACT performance. This avoids the trap of norm referencing, i.e., comparing one aircrew's performance with that of another. An aircrew's performance is always rated solely in relation to the "anchors." This has long-term implications for the objective measurement of aircrew coordination improvement.

Develop Courseware to Enhance ACT

The major courseware components developed in this task were the Aircrew Course, the Instructor Course, and the Data Management System. The design and development process is notable primarily because the content design was accomplished at a geographically separate location from the actual courseware design.

In the early part of Phase I, the entire ACTE project team met to develop the outlines for each of the two courses. These outlines were defined to the subtopic level. The second step was for the content subject matter experts (SMEs) to design the text and acquire suitable graphics and audiovisual (AV) materials for each lesson. That information was communicated via a SME content input form to the instructional designer who developed a storyboard from that input. The draft storyboard was then returned for initial SME review, adjusted per their instruction, and returned for final SME review and Aircrew Coordination Working Group (ACWG) approval. Once approved, graphics and AV materials were prepared for authoring and the actual authoring process begun. As each lesson was authored, a courseware team technical review was accomplished and the lesson made available for SME review via a shared folder on the courseware development server. Courseware errors are tracked using two vehicles, discrepancy sheets that summarize identified errors (e.g. words misspelled, missing, audio file timing off, etc.) and change requests. A change request is submitted to change approved content, graphics, or other multimedia material. Before changes can be effected in the courseware, an amended storyboard must be approved by the ACWG.

Courseware Delivery

Both the Aircrew and Instructor courses are designed to be accessed via an Internet browser. To reduce risk during the research, courseware is not fully web-enabled but is delivered by a private LAN of student station laptops and an instructor server laptop. This permits maximum portability of classroom hardware and mitigates most issues with bandwidth restrictions, the bane of all web-delivered material.

Aircrew Course

The Aircrew Course consists of five modules of instruction: Introduction, an ACT Principles and Risk Management Review module (see Figure 3), a Case Study, a Problem Solving Exercise, and a Conclusion. Development of the ACT Master Plan identified the close relationship between ACT and the Army's risk management process.

Figure 3. Army Risk Management Process

Key features of the Principles Review and Risk Management module are the extensive use of audio video files that are timed to narration. In that way, the narration provides audio progression through the course material while the AV files provide added support at the exact time of need. Another critical feature of the module is the use of comprehension checks. Since the module is essentially being presented as a review, it is valuable to provide learners the opportunity to check their retention and feedback relating to their understanding of important information (Abell, 2000). The comprehension checks provide constructive feedback in a non-judgmental way. In addition to the comprehension checks, a linked list of related topics is provided on each topic header page for those aircrew members who desire a more in-depth review.

The case study module provides an opportunity for aircrew members to become familiar with the Aircrew Guide, the performance evaluation system, and the BARS for their use in promoting and evaluating team coordination behaviors. Once they have reviewed the Aircrew Guide, students are presented a current case study. A central feature of the case study is an AV vignette based on an actual Army aviation event that focuses on automation or crew configuration related accident or incident trends. Once students observe the vignette, they are given the opportunity to evaluate aircrew behaviors using the on-line electronic ACT Performance Evaluation Checklist. Their individual responses are aggregated as a histogram and displayed to the class to serve as the basis for instructor-facilitated discussion to achieve learning objectives.

Finally, the learners are presented a problem solving exercise in which they are given the opportunity to apply their ACT knowledge and evaluation skills to a simulation derived from actual events and experiences in the field.

Instructor Course

The Instructor Course consists of six modules of instruction: Introduction, ACT Instructional Setting module, Evaluation Tools and Techniques, Observation and Evaluation Exercise, a module on Facilitation Skills, and a Conclusion.

Completion of the ACTE Aircrew Course by unit instructor pilots (IP) is a prerequisite to attending the Instructor Course. Courseware content builds on the crewmember skills learned during the Aircrew Course. The ACT Instructional Setting module emphasizes the ACT Instructor's role in an operational unit. Presentation approaches and features similar to those used in the Aircrew Course provide in-depth instruction and practice exercises on applying the ACT Performance Evaluation System tools and techniques to achieve reliable ratings of observed aircrew situations. The use of vignettes and the electronic Performance Evaluation Checklist supports practice exercises in the Facilitation Skills module.

Courseware support materials for the Instructor Course include an Instructor Guide and ACT event driven scenario outlines for use in simulator or aircraft evaluations of aircrew ACT performance.

Data Management System

Both courses were developed using Macromedia tools, Dreamweaver UltraDev and Fireworks 4.0, while animation was provided using Flash 5. A commercial off the shelf learning management system (LMS) was not employed for the delivery of these courses. Instead, an Access hosted Data Management System (DMS) that is fully compatible with emerging LMS standards was developed to capture student demographics, manage course administration tasks, and collect student critique data. A key feature of the DMS is its ability to capture student responses from their use of the ACT Performance Evaluation Checklist to evaluate crew coordination behaviors in a vignette, e.g., presented as part of a case study or problem solving exercise. Individual responses are presented privately to each student and aggregated for feedback to the instructor and the

entire class. The instructor facilitator uses the feedback as a means to guide discussion about the aircrew coordination behaviors and skills presented in the vignette.

Small Group User Test

The course production schedule required the initial design and development of two core instructional modules, i.e., the ACT Principles Review module and the Case Study. Both modules required high levels of courseware interactivity for delivery to the adult learner target audience. A key milestone in this effort was the small group user pretest of the courseware modules designed for web-based, distance learning delivery. The core modules of the Aircrew Course were presented to a cross-section of Army aircrew members drawn from staff and resident students at the US Army Aviation Center, Ft. Rucker, AL. Participant testers represented a wide range of experience and aircrew coordination process knowledge. Among the range of data points sampled were usability factors at one end of the spectrum and usefulness factors at the other end. Some courseware errors were identified as well as constructive comments regarding course content and presentation. Conclusions from the small group user pretest are based on participant ratings of 4.0 or greater on a 5-point rating scale.

- Content is realistic and relevant.
- Functions are logical and understandable.
- Features are engaging and interesting.
- Flow of topics makes sense to users.
- Acceptance, effectiveness, and impact on unit operations are viewed as positive.

The small group user pretest provided both a critical courseware prototype review and an early "draft" evaluation of the impact of ACTE on improving Army aviation mission effectiveness and flying safety. The ACWG approved development of the complete Aircrew Course and Instructor Course based on small group user pretest results.

MEASUREMENT OF ACTE EFFECTIVENESS

The effectiveness of the ACTE courseware components is measured at increasing levels of fidelity and scope. The first level of measurement after user pre-test of the core modules will be the demonstration and validation of the completed prototype courses followed by operational field testing of the complete set of training and evaluation products.

Demonstration and Validation

The demonstration and validation plan to benchmark the effectiveness of the ACTE courseware and aircrew evaluation tool set is a two-part process consisting of a usability assessment and a field study. For the usability assessment, use of the courseware will be observed and assessed in selected Army National Guard (ARNG) aviation units that represent a cross section of aircraft, missions, and operating conditions. A form of summative evaluation, the usability assessment is the first opportunity to employ the prototype courseware with representative groups of the target training audience in a field setting. This approach employs an electronic classroom environment permitting automated collection of assessment data. Courseware usability, effectiveness, and improvement data can be readily determined from analysis of assessment ratings and comments data. Assessment data will also be collected from unit instructors on their ability to incorporate and facilitate ACT into mission planning, mission execution, and after action reviews.

On the basis of feedback from the participating units, prototype courseware will be further refined. Aircrew coordination evaluation methods and measures will be finalized and tested for reliability to collect data on the acceptance, effectiveness, and impact of ACT on unit operations. Procedures for the evaluation of ACT behaviors in actual flight operations or in simulators will be finalized. The entire ACTE training and evaluation package will then be readied for a detailed field study.

The field study will be an empirical investigation to compare a unit that has received the prototype ACTE training and evaluation instruction with a unit that has not. Field study participants will be selected Army Active Component (AC) aviation units that represent a cross section of aircraft, missions, and operating conditions. The prototype courseware will be used to train observer-evaluators, establish inter-rater reliability, and standardize the field study scenario. A sub-set of the primary measures used in the initial ACT validation testbed will be used to measure performance of ACT behaviors, mission effectiveness, and flying safety. The demonstration and validation data analysis and findings will be reported to the Aircrew

Coordination Working Group and used to revise the prototype courseware as necessary for operational field-testing.

Field Test

Prior to field-testing the prototype courseware; unit leaders, instructor pilots, and aircrews in up to four different types of both ARNG and AC aviation units will receive training. Unit leader, instructor pilot, and aircrew member critiques and comments will be collected to assess the ease of use and impact of the ACTE training and aircrew coordination evaluation system on mission effectiveness and flying safety in daily flying activities of operational aviation units. Additionally, to supplement the field data collection effort, a mechanism is under development for units to submit lessons learned and results from follow-on evaluations. As in the demonstration and validation, field test data will be analyzed and the findings reported to the Aircrew Coordination Working Group. The training courseware and evaluation system will then be revised to provide a final prototype package to upgrade and sustain Army ACT.

At this point, the prototype courseware and support materials are ready for final approval and subsequent fielding and employment by Army aviation units worldwide.

ROADMAP FOR FURTHER ENHANCEMENT OF ACT

The persistent challenge is how to sustain and advance the cultural and team performance improvements achieved by initial ACT training and enhancements. Key elements for an effective long-range strategy include actions to:

- Fully integrate ACT into the organizational structure, command climate, rules, and regulations that set the stage for daily flying operations.
- Institute ongoing ACT program evaluation and sustainment activities to keep training realistic and relevant to operational missions and conditions.
- Correlate accident investigation and accident data analysis to the ACT program structure (behaviors) so that accident investigation data can be used to target specific areas of the ACT training program for increased emphasis.
- Include instruction on strategies, tools, and techniques that apply ACT behaviors and skills to manage risk and avoid, trap, or mitigate aircrew error.

Phase II will further advance the upgraded program by: tailoring training scenarios for specific aircraft and missions; integrating ACT into Readiness Level training, Annual Proficiency and Readiness Test (APART) evaluations, and Flight School XXI; providing an accident investigation tool and training materials for accident investigation and field use; including ACT in distance learning developments, and; providing a web site for ACT related data and anonymous reporting.

Phase III will focus on incorporating the products of Phase I and II as part of normal operations and deploying advanced ACT applications. It will include the development of training packages for non-rated crewmembers and implementation of the Accident Identification Tool in accident investigations.

REFERENCES

Abell, M. (2000). Soldiers as distance learners: what army trainers need to know. Retrieved from the world wide web: http://www.tadlp.monroe.army.mil/abell%20paper.htm

Department of the Army. (1992). Aircrew coordination exportable training package (Vol. 1-3). Fort Rucker, AL: U.S. Army Aviation Center.

Helmreich, R., Merritt, A., & Wilhelm, J. (1999). The evolution of crew resource management training in commercial aviation. The International Journal of Aviation Psychology, 9 (1), 19-32.

Lacoste, G. (1999, December). Improving aviation safety performance. Flightfax 27 (12) 1-3.

Orlady, H. W., & Foushee, H. C. (Eds.) (1987). Cockpit resource management training: Proceedings of NASA/MAC workshop (NASA CP 2455). Moffett Field, CA: NASA Ames Research Center.

Simon, R., & Grubb, G. (1993). Validation of crew coordination training and evaluation methods for army aviation (Tech. Rep. No. E-785U). Wilmington, MA: Dynamics Research Corporation.

ACT Performance Evaluation Checklist

For use of this form, see the ACT Aircrew Guide

CCO	BQ	Crew Coordination Objectives (CCO)/Basic Qualities (BQ)	Rating
1		Establish and Maintain Team Relationships	
	1	Establish and Maintain Team Leadership and Crew Climate	
2		Mission Planning and Rehearsal	
	2	Pre-mission Planning and Rehearsal Accomplished	
	3	Application of Appropriate Decision Making Techniques	
3		Establish and Maintain Workload Levels	
	4	Prioritize Actions and Distribute Workload	
	5	Management of Unexpected Events	
4		Exchange Mission Information	
	6	Statements and Directives Clear, Timely, Relevant, Complete and Verified	
	7	Maintenance of Situational Awareness	
	8	Decisions and Actions Communicated and Acknowledged	
	9	Supporting Information and Actions Sought from Crew	
5		Cross-Monitor Performance	
	10	Crewmembers Actions Mutually Cross-Monitored	
	11	Supporting Information and Actions Offered by Crew	
	12	Advocacy and Assertion Practiced	
	13	Crew/Flight After-Action Reviews Accomplished	

Remarks: (Use continuation sheet[s] if necessary)

Notes:

Consult the ACT Aircrew Guide evaluation procedures and guidelines. Enter a summary rating (1 – 7) in the rating block for each ACT Crew Coordination Objective (CCO). Refer to the rating scale below.

Below Standards			Meets Standards			Exceeds Standards
1	2	3	4	5	6	7

Attachment 1. ACT Performance Evaluation Checklist