

Flying Training

**T-6/T-37/T-38**  
**Cockpit/Crew Resource Management**

July 2004



Air Education and Training Command

This student guide lists all the objectives for each unit of instruction in PIT Cockpit/Crew Resource Management. These objectives identify what you need to learn. Address questions or recommendations for course improvement to the instructor. The next planned revision is July 2007.

OFFICIAL

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			<i>Total Hours</i>	<hr/> 2.0

IBT — Instructor-Based Training

## Special Instructions

### Level-of-Learning Objectives

This document uses “level-of-learning” objectives and samples of behavior in accordance with AFMAN 36-2236, *Guidebook for Air Force Instructors*. The verb used in the objective (know, comprehend, apply, etc.) identifies the desired level of learning to be achieved and implies the highest level at which student learning may be evaluated, but only the highest level is contained in each objective. A sample of behavior is a statement that specifies one of several observable behaviors a student should be able to demonstrate at the end of instruction. A limited number (a sampling) of behaviors are listed. Refer to AFMAN 36-2236 for details.

## Lesson CR0101 — 2.0 Hours (IBT)

### Cockpit/Crew Resource Management

#### Objective

Comprehend Cockpit/Crew Resource Management (CRM).

Samples of Behavior:

1. Identify current Air Force guidance on CRM.
2. Summarize the Air Force approach to CRM.
3. Explain CRM training in the JSUPT environment.

#### Assignment

Read this lesson.

#### Introduction

In a world plagued with crisis, Air Force aircrews have deployed to environments where sound teamwork, leadership, communications, situational awareness, decision-making, risk management, and extensive planning are paramount to safe and efficient operations. Because of this and other factors, the military realized the need for an aircrew coordination training program. As a result, the Air Force has had lower accident rates and increased operational efficiencies since implementing a military-unique program called Cockpit/Crew Resource Management (CRM). The following is intended as a reference source to aid the instructor pilot in AETC to be familiar with all aspects of the AETC and Air Force CRM program.

#### Information

##### CRM Definition

The effective use of all resources — people, weapons systems, facilities, equipment, and environment — by individuals or crews to safely and efficiently accomplish an assigned mission or task.

AFI 11-290, *Cockpit/Crew Resource Management Training Program*

##### Figure 1-1 — CRM Definition

In a published (1951) Inspector General's report, *Poor Teamwork as a Cause of Aircraft Accidents*, data from 7,518 major accidents determined that “poor organization, personnel errors, and poor teamwork” caused a majority of the aircraft accidents. It further stated, “The human element ... and effective teamwork is essential to reducing the accident rate.” The IG report even went as far as recommending a “teamwork training program.”

The aviation community refocused on the need for some type of human factors training after the much publicized crash of a United Airlines DC-8 in Portland, Oregon, in December 1978. Attempting to determine the nature of a possible landing gear malfunction, the aircrew allowed the aircraft to run out of fuel while circling near the landing field on a clear night in good weather. The result of this accident was the amendment of Federal Aviation Regulation (FAR) Part 121 allowing the airlines to train aircrews in what is now called CRM.

Following FAR Part 121 implementation, air carriers began to notice dramatic decreases in accident rates. Military application of these principles lagged behind our civilian counterparts, but in the mid-1980s, the Navy Safety Center and the old Military Airlift Command (MAC) began to implement airline style programs, with good results. The popularity of these programs grew throughout the 1980s and early 1990s to the point where nearly everyone had “a program.” Existing under various names, the USAF now had a combination of contractor developed and blue-suit programs.

Until the mid-1990s, there was little or no regulatory guidance or standardization of these types of programs. No attempts were made to develop a training system or career-spanning continuum. Although safety records improved, there was no general consensus that USAF CRM needed to be moved to the next level. In September 1993, AETC was tasked at the MAJCOM DO conference to “take the lead” in the development and standardization effort.

In response to this request, AETC developed AFI 11-290, *Cockpit/Crew Resource Management Training Program*. AFI 11-290 requires five levels of CRM training ranging from Awareness Training through Supervisor CRM Training. Focus is to be on military examples and the combat environment, as opposed to modified airline programs. Additionally, training and inflight evaluation of CRM for all USAF aircrew members was mandated, making the skills and behaviors “need to know” vs. “nice to know.”

**Why does the Air Force need to train CRM differently than the airlines?** There are four principle reasons why the Air Force needs to train CRM differently.

**The Crewmember** — First is the experience factor. Airline pilots, on average, are highly experienced, most with over 7,000 flying hours. In contrast, many USAF pilots don’t meet the minimum requirement to apply for the Airline Transport Pilot (ATP) certificate. Military aviators are motivated and smart, but the Air Force must account for this large difference in experience. Secondly is the age difference and related learning style differences between the military and airline crewmembers. Additionally, crew composition requires differences in training. Military CRM must include a variety of crew positions, including navigators, door gunners, flight engineers, boom operators, single-seat fighter pilots, as well as multiseat crew pilots. Mission and aircraft specific CRM programs are required to address these differences.

**The Machines** — The complexity of the machines is another factor in the training equation. A modern military aircraft requires that aircrew make split second decisions regarding weapons and other automated systems. Several incidents have resulted in inadvertent cargo or weapons release, even the unintentional shoot down of friendly aircraft. Military CRM must place additional emphasis on the man and machine interface.

**The Mission** — The relative importance of the mission must also be factored into the military CRM equation. Military crewmembers fly various type missions with different “weights” attached to each mission. Aviators apply different sets of rules to different missions such as higher headquarters missions, ORIs, checkrides, standard training missions, and of course, combat. Each implies a different priority and leads the crewmember to often ask “which set of rules am I flying with today?”

**The Environment** — Finally, there is the flying *environment*. Airline flight crews battle the environment, with safety as the paramount concern. In contrast, in addition to the environment, the military must engage a clever *human enemy*, armed with missiles and guns, who know the fight is coming and so constantly changes the rules.

Decision making by a young crewmember in a combat environment, strapped inside a complex piece of military hardware, while engaging a clever human enemy, is much different than airline flying. Therefore, the training must be different.

### Current Guidance

CRM is established and defined by AFI 11-290. The goal of the Air Force CRM program is to provide Air Force crewmembers with performance-enhancing knowledge and skills directly applicable to their roles in the aerospace mission in support of Air Force doctrine. Figure 1-2 lists the two AFI 11-290 CRM program goals.

CRM Goals
* Maximize operational effectiveness and combat capability
* Preserve Air Force personnel and material resources

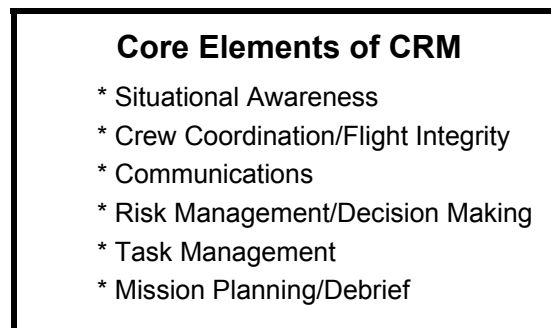
Figure 1-2 — CRM Goals

What does this mean to the flying community? Simply stated, the Air Force CRM program will improve your effectiveness, help you fly safer, and increase your training capabilities. The concepts learned and discussed in the texts and during discussion groups will help each individual understand how to cope with situations that occur during flying. As you progress through this and following lessons, you will be able to learn from others mistakes, and build your confidence in the pillars and principles of CRM.

## CRM Core Elements

CRM training has influenced flying performance by applying core principles that involve all crewmembers in decision processes. The engineers, loadmasters, boom operators, systems operators, and navigators have valuable information in these processes. For the single-seat fighter, coordination between formation members, between ATC and AWACS etc., also involves all aspects of CRM to ensure safe mission accomplishment. The safe conduct of the mission and critical decisions become a shared experience that involves inputs from all members involved in the process. This doesn't relieve aircraft commanders of their responsibilities; rather, it allows them to share in the safe and efficient completion of the mission with the other crewmembers involved.

There are six core elements in the Air Force CRM program (Figure 1-3). These elements will be discussed and reviewed in the following text. The classroom discussions associated with each element should provide a dynamic environment for you to express your views and learn from the experience of others.



**Figure 1-3 — Core Elements of CRM**

The essence of CRM is to remain alert and alive; teach your students how to learn from others' mistakes and to beware of the symptoms of CRM breakdown as well as how to reestablish CRM. You must tell your students they are a valuable team member. Their assertiveness and timely inputs could make the difference between a good training mission and an accident. Your role as an instructor pilot is to have a strong understanding of CRM, and be able to impart that to your students to help build their knowledge.

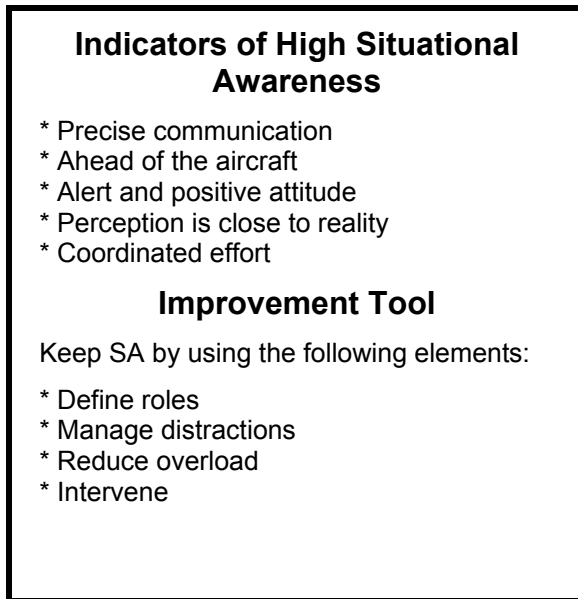
### Situational Awareness

The first core element of CRM is Situational Awareness (SA). Simply stated, SA is knowing what's going on around you and using your experiences to accurately understand how to manage the distractions. As the manager of your student's training, you are charged with staying aware of the total training situation. You and your student must remain focused on the mission and the progress of the flight. The instructor must be alert for changes in situational awareness and take corrective action as required. By making coordinated adjustments to mission distracters the student can continue to maintain high SA.

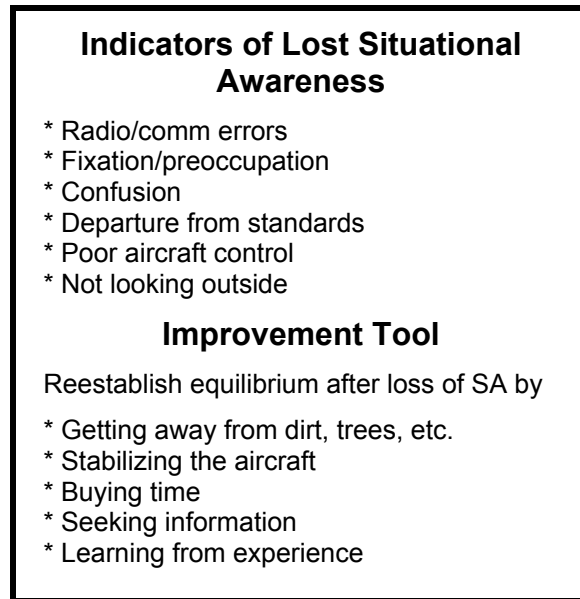
Ideally, you would like your student to exhibit high SA throughout the mission, but SA is seldom constant. The demands from outside agencies and distractions in the cockpit can lead to confusion, disorganization, and an overall reduction in SA. As the situational awareness of the student deteriorates, the primary job of flying sometimes becomes secondary and the focus of the mission shifts to the distracting event. To prevent the training flight from becoming an ineffective sortie or a statistic, the instructor must get the student back to a high degree of SA.

There are numerous improvement tools to help keep individuals situationally aware (Figure 1-4). As the instructor you must clearly define the student's duties and responsibilities, manage the distractions, and reduce the inevitable student task saturation. These improvement tools, when applied correctly, can return a student back to peak situational efficiency. However, if SA is completely lost, steps must be taken immediately to establish equilibrium so that the student can catch up with the aircraft/situation and regain a safe level of SA.

Situational awareness is an important core element of CRM. SA requires the crew to remain alert and be aware of the symptoms of losing SA and how to regain SA (Figure 1-5). Regardless of position or rank, each individual crew/flight member is a valuable part of the team. Assertive and timely inputs can make the difference between a successful training mission and a flight mishap.



**Figure 1-4 — Indicators of High SA**



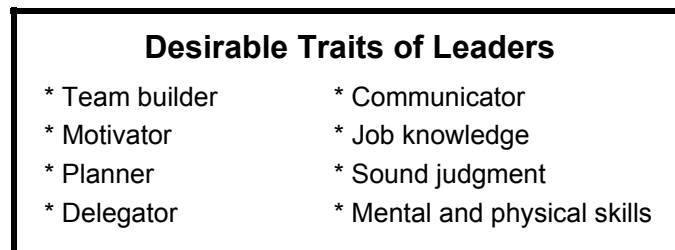
**Figure 1-5 — Indicators of Lost SA**

### **Crew Coordination/Flight Integrity**

Crew coordination/flight integrity is a complex process and is a significant factor in a mission's success or failure. The following text focuses on the example set by the instructor in crew coordination/flight integrity. Your ability to lead/follow, build teams, teach assertiveness, accept assertive behavior from students, resolve conflict, and avoid hazardous attitudes will all be closely scrutinized. Your students will copy the way you conduct each training sortie and the way you deal with each situation. The components that make up crew coordination/flight integrity are interrelated, but they will be separated here so that each area can be discussed. The first area of discussion is leadership.

The need for leadership on any mission is obvious. Leaders set the goals, both long and short term. They also create and sustain the crew's/flight's motivation in pursuing these goals. Leaders monitor and provide focus for the crew's/flight's activities.

During student training missions, the IP/aircraft commander sets the tone for the mission. Your influence can enhance the mission or it can be a significant distracter. Figure 1-6 has samples of good leadership traits. Your flying experience probably reminds you of when you saw other pilots displaying these traits. Make sure your students remember your desirable leadership traits.



**Figure 1-6 — Desirable Traits of Leaders**

As the aircraft commander, instructor pilot, and leader you have two critical responsibilities. First, as the aircraft commander, you are responsible for the final decision, whatever decision-making process is used. Second, authority resides with the leader, so you must establish an atmosphere of command, while encouraging active participation and critique by all flight members. Remember that during the first few flights and days you spend with your students they will form an opinion that establishes their attitude towards you, rules, and other members of your training flight. Leadership style can be adjusted based on the situation, or it may vary by personality. Regardless of the style you choose, there are several elements of good leadership that are important to incorporate into your leadership style.

- |  |                             |
|--|-----------------------------|
| * Leaders initiate action or discussion        | * Leaders resolve conflicts |
| * Leaders inquire to gain access to facts/data | * Leaders make decisions    |
| * Leaders advocate                             | * Leaders critique          |
| * Leaders praise good performance              |                             |

Just as important as your leadership style and skills are your follower abilities. You will demonstrate how you react to being a follower to your students on numerous occasions. They will watch and learn how you react to mistakes made by the formation leader and to decisions made by the flight commander that you may or may not agree with. Remember, many of the desirable traits of a leader are the same ones a follower must have and use. It is extremely important that you teach your students how to follow because that is the position they will assume initially in their first operational assignment.

The second crew coordination/flight integrity area relates to team building or flight leadership. On a team, the entire crew shares decision responsibilities because you are all working toward the mission's ultimate goal. In the JSUPT environment, it may seem at times that you are the only one working toward this goal. However, in order to teach your students how to be part of a team, you must provide the leadership and followership role models. As the leadership abilities of your students increase, you will be able to allow the students to practice the tools they have learned.

Assertiveness — the act of stating something so it is received in a positive manner.

**Figure 1-7 — Assertiveness**

The third discussion area is assertiveness (Figure 1-7). The ability to continually show a new student what they are doing wrong in a positive manner is a difficult task. Unfortunately, the objective to determine *what* is wrong often gets mixed up with *who* is wrong. It is your job to ensure your students fully understand how to use the three levels of assertiveness to determine *what* is wrong. The first level is inquiry; the second is a five-part assertive statement; and the third is a standard assertive statement.

The first level of assertiveness or inquiry is asking questions regarding actions or decisions. Your students will have no problem providing you with a steady stream of inquiry questions. You will also use this technique to find out what they know about the situation. Inquiry is a form of constructive criticism about the existing situation. It is a process of continually searching for and obtaining information you do not possess. One way to inquire is to ask questions; “What’s your approach plan?” “Are we cleared to land?” and “What systems will we lose if we shut down the engine?” When you practice inquiry, you are actively seeking information from available sources, including your students.

The second level of assertiveness is using a five-part statement (Figure 1-8). This is more definitive than simple inquiry. The first step is to get the attention of the leader “Captain Casper...” Next you state your concern “I’m not sure...” after stating the concern, explain the situation “If it blows...” Offer suggestions or solutions to resolve the situation “We should...” The last step is to get agreement “What do you think...?” This type of assertiveness will help to get your students to take ideas and situations to a logical conclusion. In addition, you should expect your students to use this approach on the rare occasion when you make an error.

### Improvement Tool

Steps to make an assertive statement:

- \* **Get attention** — “Captain Casper....”
- \* **State concern** — “I’m not sure....”
- \* **State situation** — “If it blows....”
- \* **Offer suggestion** — “We should....”
- \* **Get agreement** — “What do you think....”

**Figure 1-8 — Five-Part Assertive Statement**

The third and most affirmative level is the standard assertive statement. This can be standard phrases that are used by crewmembers as a warning of a deviation or a loss of situational awareness. Words such as “TERMINATE” or “KNOCK-IT-OFF” are two examples that have been incorporated into standard procedures (Figure 1-9). You must teach your students that no reprisal will be made when an assertive statement is used. It provides an opportunity to break the error chain before a mishap occurs.

### Improvement Tool

When you need to warn the crew/flight of a deviation or loss of situational awareness, use a standard assertive statement such as

**“Terminate” or “Knock-It-Off”**

**Figure 1-9 — Assertive Statements**

“IMMEDIATELY,” “NOW,” and “BREAKAWAY” are other examples of assertive statements. Remember that these assertive statements may also come from the aircraft’s systems in more advanced avionics packages. The reaction to

any of these assertive statements may provide the necessary margin to prevent an accident. Your job as an instructor is to teach your students how to react to these statements in the T-6/T-37/T-38 and in future aircraft.

A concept that goes hand-in-hand with assertiveness is advocacy. Advocacy is the obligation to speak out in support of or against a course of action. Advocacy is taking a stand, deciding on a position, or establishing a way to accomplish a task. It also incites others to inquire as to what is the best way or technique to accomplish a task or a maneuver. The objective of what is right, not who is right, also applies to this concept.

The fourth area of crew coordination/flight integrity is conflict. Conflict is an integral part of healthy team interaction. The good leader uses conflict to produce growth and establish a broader information base. Resolving conflict by face-to-face sharing of information and creating win/win settlements are important leadership skills. In a training environment, the IP must be able to control the amount of conflict present to be able to manage the student's interactions. The four phases of the conflict resolution cycle are:

1. Sharing — Participants share information
2. Commitment — Commitment/expectations
3. Stability — Team stability and performance
4. Disruption — Disruption invariably occurs

The phases of conflict resolution vary in the amount of time it takes to work through each one. As the instructor you must keep the level of disruption from overwhelming the abilities of the student and keep the mission moving toward goal accomplishment.

The final crew coordination/flight integrity discussion area is hazardous attitudes. Hazardous attitudes are any concepts or beliefs that will cloud individual or flight judgment preventing them from functioning in a positive, mission enhancing way. The examples below are samples of behavior (attitudes) to be alert for in yourself and your students.

1. Antiauthority
2. Intimidation
3. Invulnerability
4. Get homeitis
5. I'd rather die than look bad

Crew coordination/flight integrity is an important core element of CRM. It defines how each person is viewed and used as part of a training mission, be it a single-ship or formation sortie. As you may have already noted, a few poorly chosen words can have a very detrimental affect on the fragile skills of a student pilot. That is why the next element (effective communication) is so important.

## Communication

“What we have here is a failure to communicate.” How many times have you heard this statement as an explanation of procedural or performance failure? Communication glues the core elements of CRM together. Without effective verbal communications during student training missions, very little will be accomplished and most likely undesirable things will happen.

### Elements/Indicators of Effective Communications

- \* Convey information clearly and concisely in a timely manner.
- \* Use standard terminology.
- \* Acknowledge communications.
- \* Provide information as required.
- \* Repeat information.
- \* Ask for clarification when needed.

Communications means more than speaking clearly with proper phraseology. It means ensuring that the other person understands what you are saying and you understand what the other person is saying. This concept is extremely important when you are introducing new and difficult maneuvers to your students (Figure 1-10).

Standard terminology for radio calls and crew communications is a good place to start in learning effective communication. As an IP, everything you do and say will

**Figure 1-10 — Elements of Communication**

be repeated back to you and the world by your students. Be sure you are setting the example you want others to follow.

Effective listening is hard work. Good communication depends on listening carefully. Pilots select their words to convey thoughts in a succinct and clear manner. Standard checklists, systems, and flight terminology facilitate good communications among fliers. The abbreviated language used by flight crews is a means to convey thoughts clearly and succinctly. It is the listener's responsibility to provide active feedback when the message is garbled. Make sure your students understand that they must tell you when they don't understand what you're saying.

One of the reasons for communication failures is the fact that people don't practice good listening techniques. Several of these techniques are listed to the right (Figure 1-11).

Conversely, a poor listener displays attributes that inhibit effective communications. The poor listener plans while you talk, debates each and every issue, tries to detour you to another area, or just tunes you out completely.

Even when you apply communication improvement tools (Figure 1-12) there are events or barriers that may be preventing you from communicating effectively with your students or other outside agencies.

Barriers to effective communication come in many forms (Figure 1-13). You may, or may not, be able to change or remove the barrier(s). However, you should be able to control or manipulate the effect of most barriers. As an instructor, you must have the ability to talk to the student. At times it may be better to take the aircraft and wait until the distraction is gone than to try to talk over or around it. It is your job as an AETC instructor pilot to attempt to overcome these barriers to the maximum extent possible. Some of these barriers are well within your control whereas others are beyond your control. Strong mental preparation and recognition of these barriers and your ability to overcome them will keep you ready to take action when the barriers arise.

Communication and the ability to clearly convey your thoughts and ideas impact all aspects of your life as an AETC instructor pilot. It is easy to see that it impacts situational awareness, leadership, assertiveness, mission planning, decision making, and every other critical phase of flight. In each of these areas, there are critical elements that you and your students can use as tools for improving communications. These elements are listed under the same major headings as the core elements of CRM training.

#### Situational Awareness

1. Be aware of the *quiet cockpit* and *quiet radios* (the calm before the storm).
2. Note (*communicate*) deviations.
3. Make an *inquiry* whenever there is doubt.
4. Avoid preoccupation with minor details (tunnel vision).

### Good Listening Techniques

- \* Active attention
- \* Actively inquire through questions and feedback
- \* Provide response — agreement, disagreement, acknowledgment
- \* Actively interpret and evaluate what you hear
- \* Eliminate personal prejudices

Figure 1-11 — Good Listening Techniques

### Improvement Tool

Active listeners have a responsibility to

- \* Ask questions
- \* Paraphrase — Did I hear you right?
- \* Provide eye contact and use body language

Figure 1-12 — Listener Responsibilities

### Communication Barriers

- \* Engine noise
- \* Static in headphones
- \* Equipment malfunctions
- \* Formation on different frequencies
- \* Rank, gender, or culture
- \* Emotional state
- \* Task overload
- \* Limited time
- \* Style and perceptual differences
- \* Training and experience differentials

Figure 1-13 — Barriers to Communication

5. Identify (*communicate*) problems and potential problems.
6. Assertively *speak up*.
7. Recognize (*communicate*) the need for action.

### **Leadership**

1. Set a tone for the free flow of information.
2. Establish how you want to *communicate*.
3. *Tell* students/flight members what to do.
4. *Inform* members of mission progress.
5. Provide *feedback* on current performance.

### **Assertiveness**

1. *Ask* questions when uncertain.
2. *Advocate* a specific course of action.
3. Make *suggestions*.
4. *State* opinions on decisions and procedures.

### **Mission Planning**

1. *Critique* existing plans.
2. *Identify* potential impact of unplanned events on the mission.
3. *Define* tasks based on mission requirements.
4. *Explain* tasks, plans, and objectives.

### **Decision Making**

1. *Ask* for input.
2. *Discuss* problems.
3. *Cross-check* and *confirm* information sources.
4. Identify (*communicate*) alternatives and contingencies.
5. *Ask* for pertinent data before making a decision.
6. Anticipate (*communicate*) consequences of decisions.
7. *Provide* rationale for decisions.

### **Critical Phase of Flight**

1. Minimize radio calls to those required by SOPs.
2. Clearly repeat instructions back to the controlling agency with full call sign.
3. Listen carefully for checklist completion.
4. Make inquiries as needed for information.

You must teach and show your students the importance of checklist discipline. Any breakdown in communications during emergency procedures can be fatal. This fact should be part of your “table top” discussions and part of the daily preflight briefings.

## Risk Management/Decision Making

### Risk Management

Risk management starts at the top of an organization. When talking about student training, that level is the IP/aircraft commander. Your students need to know your policy on risk. They must also know you will be involved in all decisions that involve unusual risk. The more you consider risk management and assessment during the planning process, the higher your probability of success. Make sure your risk decisions are made at the proper level. As the aircraft commander and IP in a training environment, it may be appropriate to allow the decisions to be made at a lower level (student) to get them involved and comfortable making decisions. At other times you may have to get outside help when you feel it is necessary. If the benefits don't outweigh the costs, don't accept the risk, especially during training missions.

Risk management is nothing new — each of you manages risk on a daily basis, while working, driving, shopping, investing, etc. Most decisions are automatic, guided by years of experience coping with the same or similar situations. In a sense, you are all experienced “Risk Managers.”

Risk management is an organized framework for decision-making. The aim of risk management is to minimize losses, whether associated with money, equipment, or personnel safety, while maximizing mission success. It is the rational decision process: weigh *expected* costs against *expected* benefits — if benefits outweigh costs — go for it, otherwise don't. The dilemma most often is how to quantify *expected* costs and benefits.

### Decision Making

The best place to do your decision-making is on the ground during the planning phase when you can focus your full attention on the problem. The better you prepare for a mission, the better your decision-making will be. There are many theories and process models on the subject of decision-making. The main elements of good decision-making are acquisition of appropriate information, accurate assessment, accurate judgment of probability of events, and risk management. These elements are centered on maintaining high levels of SA. This lesson covers two models that can be applied to aviation: The Classic (Analytical) Model that can be used in most situations where time is not a factor, and the Automatic (Intuitive) Model that can be used in an emergency or situations where time is critical.

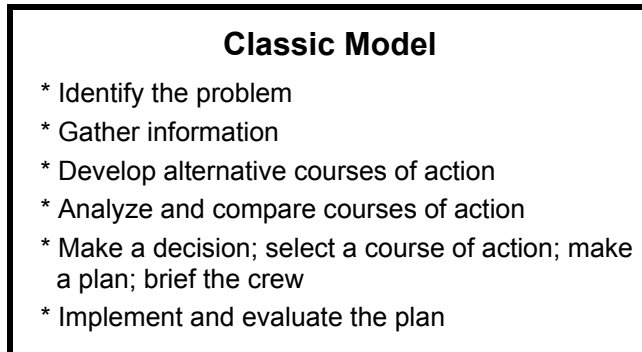


Figure 1-14 — Classic Model

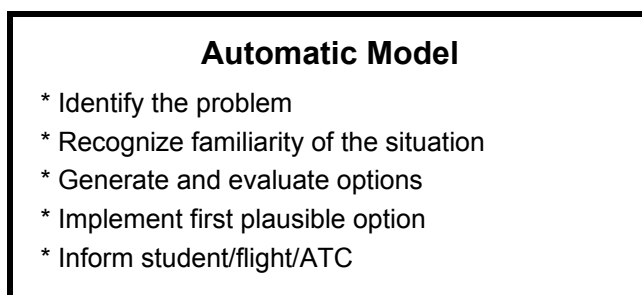


Figure 1-15 — Automatic Model

The classic model is the textbook model you may have seen in other military courses (Figure 1-14). It incorporates all the decision-making elements previously discussed, plus one. The addition to this model is the step to identify the problem. At times, the perceived problem may not be the actual problem. This is the step where you try to get your perception of what's going on as close to reality as possible. Your SA needs to be at a high level to be sure the correct problem is identified.

Stress can be a problem during this initial step. A sudden or unexpected problem causes stress, and that stress level can remain high until you get a handle on the problem. Excessive stress can be one of the main reasons for a reduction in student SA. Those once good students can be turned into poor, unresponsive passengers in a matter of seconds.

The other model is the automatic model (Figure 1-15). This model is used when you can't do a thorough analysis due to time constraints. Use of this model should be limited to those most critical situations when you must act now or face grave consequences. Hopefully, there will not be many occasions to use this process during your flying career.

The situation requiring the use of this model calls

for action *now*! The first step is to identify the problem. Time may not allow thorough analysis; you must focus quickly. Step two is to recognize the familiarity of the situation. Hopefully, somewhere in your past experience, training, simulation, mission planning, and/or practice missions, you have experienced the situation you are facing and have a course of action in mind.

The third step, generate and evaluate options, is a combination of steps three and four of the classic model with a few differences. This step is a mental simulation with each course of action evaluated as it comes to mind. You won't have time to gather inputs from your students as you evaluate the options, act on the first one that you consider plausible. If your situational awareness is high, your choice will be successful.

Finally, a review of the differences between the models will show the strengths of the classic model are greater than the automatic model.

1. The classic requires time to analyze; the automatic requires little time.
2. The classic allows extensive external information gathering; the automatic allows none.
3. The classic considers many alternatives; the automatic considers few.
4. The classic allows extensive analysis of each alternative; the automatic allows little analysis.
5. The classic allows the choice of the best alternative; the automatic implements the first plausible alternative (e.g., boldface).
6. The classic allows for maximum crew involvement; the automatic allows none (except briefing and execution).

A major area in both models that needs to be addressed is time management. This part of the decision-making process dictates which model you will be able to use to solve the problem. Just how fast do you have to make a decision? Ask yourself the following questions before starting the process:

1. Do I need to act now?
2. Will it hurt to delay this decision?
3. Can I wait for outside help before acting?

Making a rushed decision can be deadly. The answers to the above questions must be formulated in a timely manner. If you do not have a solid time frame in mind before you start to solve a problem, you may choose the wrong model to help you make the required decisions.

Although there are many decision models, most of them incorporate the basic decision-making steps in Figure 1-16.

### Task Management

The following text continues the review of CRM elements and tools that you'll use as a T-6/T-37/T-38 instructor in flight training. The material focuses on getting everyone's CRM knowledge to the same level, while at the same time, get you thinking in terms of how you'll use this material on the flightline. The following text introduces flight training task management and mission planning, review, and critique. You'll learn how to identify overload, underload, automation resources, and proper checklist discipline and use of Standard Operating Procedures (SOPs). The lesson will also address the principles of mission analysis and planning, briefing, mission review, and critiquing; in short, putting it all together from preflight briefing to the postflight debriefing. Improvement tools taught in pilot training are provided to emphasize key points in the lesson.

As the instructor, you'll have to know when your students have reached the saturation point and take appropriate action. Pilots who receive so much information that they cannot process it or develop a logical sequence of actions become confused and make mistakes. Experience can help to prioritize these demands and to initiate responses in a logical sequence, but your students don't have the benefit of experience. They may be overloaded for a large part of their T-6/T-37/T-38 training.

#### Improvement Tool

Basic decision-making process:

- \* Gather information
- \* Identify courses of action
- \* Evaluate courses of action
- \* Assess risks
- \* Decide
- \* Brief
- \* Act and evaluate

Figure 1-16 — Decision-Making Process

#### Overload Indicators

- \* Confusion
- \* Channelization
- \* Failure to prioritize
- \* Frustration

Figure 1-17 — Overload Indicators

Overload may be very difficult for your students to recognize in themselves (Figure 1-17). As the IP/observer you'll notice the overload indicators in your student's behavior. Showing them how to recognize when they are overloaded and how to unload them may save their lives some day.

One aspect of overload that *you* may experience during instructor training is negative transfer. When an experienced pilot is put into a new environment and is confronted with overload, the tendency is to revert back to what is most familiar. An example is not using the proper terminology for the "gear clear" call or not using any call at all as a result of the "single-seat" mentality from a previous system.

The next paragraphs present tools that can be used to combat overload. You'll find that students will be able to handle more information when they become proficient, so encourage your students to stay in the books and know the procedures. Prioritizing tasks is a tool that can be used to combat overload. Like proficiency, it's a learned response. The more experience you have, the easier prioritization becomes. If you or your students have trouble prioritizing tasks, then the next tool, delegation may be useful for your situation.

Permission planning is the first place where delegating responsibilities should be accomplished to prevent overloading one person. During permission planning, all flight members can assist in building the mission profile by checking the weather, gradebook requirements, etc.

When there are too many tasks to be accomplished, prioritize them to create time for the most important. If you're proficient, you create time by being efficient at your job. If you delegate properly and no one is overloaded, you've created time by spreading the tasks and duties equitably. The best and most effective way to expand time available is to have a well-organized and analyzed plan.

When your students are overloaded, have them verbalize their intentions so as to alert you of their intended actions. Verbalizing forces your students to think about what they're doing by translating words into action.

The direct opposite problem from overload is *underload*. Underload is where your students don't have enough to do. Is that bad? The obvious answer is "No"; everyone needs time to relax. The important point is picking the right time to relax. Flying the aircraft is not the time to totally relax. There is a need to maintain safe situational awareness. If not, the response to unplanned events may be slow, and with students, these responses may become unpredictable and dangerous.

A person who is underloaded has a tendency to daydream, miss assignments, or lack precision. With low activity levels, such as on a cross-country leg, the conditions for the onset of boredom, inattentiveness, and complacency are ripe. These conditions can lead to surprises, the last thing any instructor pilot wants during a flight.

As the IP, you must manage your students' low workload periods — have them relax but keep monitoring flight conditions; ask them questions, but don't let the need for an answer become the priority event. If you manage your students' low workload periods, situational awareness should not reach the unsafe level (Figure 1-18).

The last part of task management is checklist discipline and SOPs. Tools for good checklist/SOP discipline include mental attitude, consistency, and knowledge. *Mental attitude* is the basis for checklist/SOP discipline. If your students look at the checklists and SOPs as important tools for workload management, they will ingrain the habits of good use in their mind as the foundation for dealing with high-stress situations.

The next tool is *consistency*. Consistency involves application of the checklist or SOP the same way every time. This means not skipping around in the sequence of accomplishment and not allowing others to vary. In a high-stress situation, an off-the-wall response to a query can cause confusion and serious consequences.

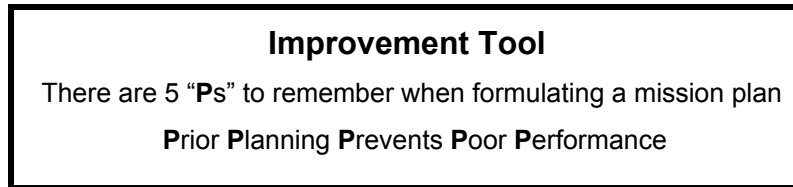
The final tool is *knowledge*. In-depth systems knowledge and consistent checklist/SOP discipline improves communication, reduces workload, and speeds accomplishment of tasks.

<p><b>Improvement Tool</b></p> <p>Tools to combat <b>Underload</b>:</p> <ul style="list-style-type: none"> <li>* Know tasks to perform</li> <li>* Prioritize tasks</li> <li>* Change tasks occasionally</li> </ul>
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**Figure 1-18 — Underload Tools**

## Mission Planning/Debrief

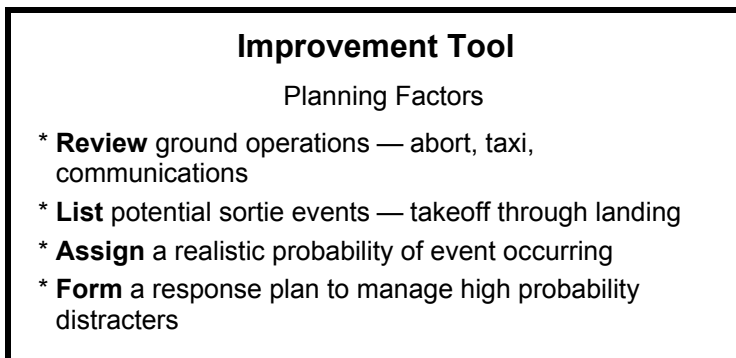
Planning is vital to the training mission. Without a comprehensive plan, mission effectiveness is greatly reduced. If a thorough and efficient mission strategy is developed, you'll leave less to chance and more to good planning. The result of good mission planning is improved performance and enhanced flight safety. The five "Ps" are very important in the fast-paced training environment of AETC (Figure 1-19).



**Figure 1-19 — Five "Ps"**

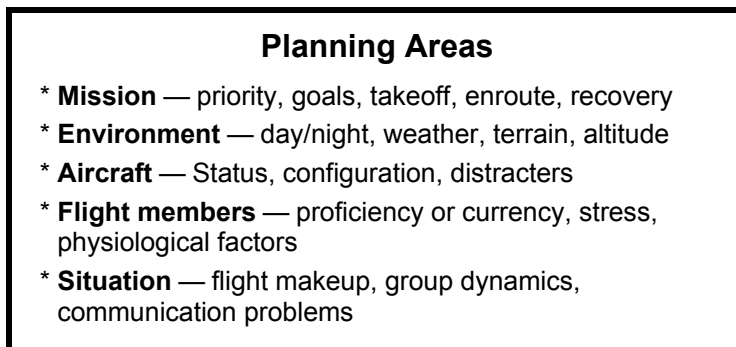
The mission goals, purpose, and completion criteria must be understood before a plan can be formed. You must know what you are trying to accomplish, why you are doing it, and how you will know if you have completed the task correctly. To divide the planning process further, the goal of premission analysis and planning is to address the primary mission, the mission phases, and probable events that may occur must also be considered.

The reason for spending time and effort in analysis and planning is to reduce the likelihood of unanticipated events. Events that "just happen" are met initially with a reaction of learned responses. These responses may be either right or wrong for the event. However, if your emergency procedures briefing prior to the flight was thorough, your reactions are more likely to be accurate for the situation. Good planning and analysis reduce uncertainty when responding to a situation (Figure 1-20).



**Figure 1-20 — Planning Factors**

If you've addressed most issues that will, and predictably could, affect your mission, you've increased your ability to anticipate events that might distract, saturate, or channelize your attention. When you are distracted from your primary tasks, your situational awareness decreases. The first step to becoming a flying safety statistic is losing situational awareness. If you've anticipated probable distracting events, you've developed a plan for coping with different situations and can implement those plans with minimum inflight planning.



**Figure 1-21 — Planning Areas**

Before you finish your planning, think about the percent of your mission goals you need to accomplish to consider the training mission effective. As the instructor you need to know how much needs to be accomplished on each sortie to make it effective. The analysis of the minimum requirements, as well as the desired goals, will help you maximize each sortie.

Figure 1-21 presents five specific areas that should be considered when planning a mission. These factors are not all-inclusive, but provide additional insight as you plan, analyze, and organize your mission.

The last part of mission planning is the briefing. The culmination of planning is a briefing that ensures everyone is aware of the mission parameters. The briefing should address the issues that will make the mission successful. If each individual or flight member has planned properly, the briefing will contain no surprises.

Most organizations have a briefing guide that incorporates all the key issues that must be discussed. The briefing guide provides a logical sequence to present the plan. A good briefer will present the most predictable situations and allows time to answer the questions and concerns of other flight members. A great deal of coaching will be required to get your students to give a good mission briefing (Figure 1-22).

### **Mission Review**

The need to analyze and predict unforeseen situations is important. The number of situations you may encounter during a flight is unknown, but your reaction to each situation can be controlled with knowledge. If you predicted possible situations in your mission analysis, then you are prepared to adjust your plan. While conducting student training, you need to balance flexibility with student preparation. For example, you brief a particular low-level route as your student's first low-level mission. After you're airborne, you find out that the weather for your briefed route is below minimums at the entry point, but the weather is good at the alternate entry point. Do you attempt to fly to the alternate entry point or proceed on your backup mission?

As any training mission progresses, a midmission review must be made. Are objectives being met? Am I flying the plan? Do I need to make a midcourse correction? These are questions that should be addressed to see if the plan is on track. If required, the corrections to the plan should be modifications or alternatives discussed in the briefing (flight split up due to weather instead of a wing landing, etc.). Modifying an existing alternative is a relatively simple task that should not draw too much of your students' attention from their primary duties. If you haven't preplanned this event, the time and effort diverted to replan the sortie can result in situational awareness problems (Figure 1-23).

A good mission debrief provides both positive and negative feedback. The debrief reinforces lessons learned, and if all individuals accept the critique openly, facilitates open communications. Students should always walk away from the debriefing understanding what went right, what went wrong, and what could have been done better. They should know how to fly the training mission better the next time.

### **Preflight CRM Training**

The flight training environment is different from operational units in at least one important way. In pilot training an attempt is made to limit the number of different instructors that fly with any given student. However, during the formation block of training, your students might find themselves paired with many different students/instructors. In operational units, students might find themselves flying with many different flight members in much more complicated mission packages. As an instructor, you need to develop in your student an approach to preflight activities that will lead to an effective training mission.

As the instructor, one of your key concerns will be stress management. Remember from your previous training, some stress is good and keeps students operating at peak efficiency. Too much stress causes performance to breakdown. This concept applies to student duties during the preflight phase. You can't expect students to do everything right on their first training sortie. However, you need to keep adding responsibilities as training progresses, so your students will have all the skills required to succeed when they get to their operational aircraft.

### **Inflight CRM Training**

Now comes the hard part. If you review the Maneuver Item Files (MIFs), you'll see that there are anywhere from 38 to 44 items to cover on most missions, including all of the CRM core curriculum elements. The objective of instructing your student to fly could conflict with the traditional concept of CRM. In operational aircraft, other flight members will

### **Indicators of a Good Briefing**

- \* Addresses relevant issues
- \* Presented in a logical sequence
- \* Appropriate amount of detail
- \* Plausible alternate mission
- \* Time for questions and answers

**Figure 1-22 — Indicators of a Good Briefing**

### **Improvement Tool**

*It's better to modify a briefed event than to try to plan from scratch.*

**Figure 1-23 — Improvement Tool**

often help each other out as soon as they see a potential problem. In JSUPT you and your student need to operate as a crew, but you cannot talk your student through every maneuver. Eventually your student needs to learn to fly the aircraft with no inputs from you. How then do you as an IP instruct CRM *and* instruct stick and rudder skills?

Part of your problem will be solved in the preflight phase by briefing IP/student responsibilities. Here are some areas to consider. Early in students' flying experiences, the rules of engagement for CRM will include inputs from the IP over mission critical items (traffic, minimums, configuration, etc.) as well as talking through all the basic maneuvers with your student.

As student proficiency increases, you'll shift responsibility for mission accomplishment more on your student, and reduce your inputs to mostly safety of flight items and standard responses. At that time, your students should have a feel for what constitutes appropriate help and what constitutes too much help from the IP. As the IP, in the latter phases of training, you may need to control when to provide help and when to let your student handle the situation.

Remember, the most important training you provide to your students may be the way you actually perform. Your students will operate within the initial boundaries you establish with them. More realistic training will always take place when unplanned situations occur inflight. If you constantly use all the CRM tools available to you for each and every situation, your students will learn the benefits of CRM and how to effectively use the resources available in an emergency, divert, weather recall, or other nonstandard situation. If, on the other hand, you don't emphasize the value of CRM skills inflight, or exhibit a lack of CRM skills, your students will learn that CRM is of little value and can be ignored if the going gets tough.

As an IP, you'll make a mistake at some point. If you have taught your students to use CRM skills well, they should be able to alert you to the mistake, and help resolve the error using all available resources. No matter how much you wish you could ignore the incident, you need to reward this type of heads-up CRM. Remember, even a student can be right sometimes.

### **Postflight CRM Training**

After landing, the next step on the agenda is the mission debriefing, completing paperwork, and of course, there are your additional duties that need to be accomplished. Is there really any need to waste time trying to instruct CRM after the flight is over, or should you merely assign a CRM grade on the gradesheet? After all, your student either performed well or not. If not, it's a little late after the flight to solve the problem. If your student performed well, then there is no problem.

The postflight phase is very important to the development of good CRM skills. During the debrief your students have the opportunity to learn from each other and prepare for future flights. Careful use of this phase can achieve more CRM training in a shorter time than all of the CRM lectures and classes in JSUPT.

After the flight, two important events should occur. First, your student should resolve any open questions and do what psychologists call "come to closure." The flight should not break up into individual members going separate directions until there has been a thorough debriefing allowing all to ask questions, critique performance, and deal with any conflicts. Second, you as an IP need to assign individual grades on maneuvers and an overall grade, which directly effects your student's future assignment. These events are separate.

Before worrying about grading, you need to provide time for you and your student to talk. Initially, students will be very uncomfortable talking about performance in front of the IP or each other. They don't want to remind you of a downgrade you may have forgotten. In addition, your students will be extremely hesitant to ask you about areas of your performance they thought could have been improved. However, it is in those questions and comments that the theory of CRM will become reality. On the first few flights in the program, you need to establish the pattern of talking to students about their actions during the flight. One way to do this is to establish the conversation on the way back to the squadron, in life support, in the snack bar, or anywhere other than formally sitting at a table with you in your IP chair. Questions are a good way to get the process started. "Lt Hands, you appeared to be behind the aircraft on that approach. What could you have done better to decrease your workload?" "Capt Jones, were you surprised when Lt Hands gave you the gear down signal at such a late position?" or "Did you hear our directed channel change to tower frequency?" The point of the questions is to get your students talking about the sortie and how they reacted to certain events.

During the postflight phase your students need to recognize things that worked right, particularly when your students have never seen the situation before such as, "when we called *blind*, lead did a good job talking our eyes back on to lead." Your students need to ask questions and resolve conflict, particularly in areas such as, "we really overshot big time on that turning rejoin, were you holding 300 knots the whole time?" And finally, your students need to disband as a flight or prepare for the next mission. On a local sortie some approach such as, "All right, I think I can see a couple of

things that need to be done differently next time; let's get the paperwork done so you can get to academics." ends the postflight briefing and establishes an IP/student relationship for the grading exercise.

When the time comes to assign grades, any discussion should come as no surprise to your student. The items should have already been covered in the debrief. The grade is just a necessary evil in the JSUPT process. If there is any key to instructing CRM during postflight, it is to instruct CRM as an essential element of the debrief.

### **Nontraditional CRM Training**

**Hypothetical Situation** — You go out to the airport to take your Piper Cub around the pattern and brush up on your landings. As you are preflighting the aircraft, you notice a student drag a BD-5 out of the hangar and without even walking around the aircraft or wondering about the pool of oil on the hangar floor, hop in and takeoff. Would this event make you uncomfortable about your student's commitment to flight safety? Would you talk to your student later about the need for careful preflight and safe operations, even though this is not a syllabus-directed event? If your answer to both questions is yes, you are most likely an individual that pays more than lip service to the concept of safety and looks for opportunities to develop the same level of safety awareness in your students. You should attempt to build the same level of commitment to CRM.

Teaching CRM in nontraditional situations is part of this lesson because your level of commitment to the core elements of CRM should be so high that you become uncomfortable when you see those elements being violated — you should become just as uncomfortable as when you observe an unsafe act. If you think about the CRM core elements, most of them deal with human behavior and interaction. You, as an IP, need to be attuned to what is going on around you and use opportunities presented to develop CRM skills in yourself and in your students.

### **Summary**

Changing your students' approach to CRM will not occur overnight. In fact, students will not really develop a strong commitment to CRM until they get into an operational system and see if what you have been saying about CRM is true in the "real Air Force." However, if you, as a role model, take the concept of CRM seriously, your students are going to be predisposed to take CRM seriously. Further, when your students get to an operational unit and find that CRM is, in fact, a way of life, the transition from new pilot to operational pilot will occur much more quickly.