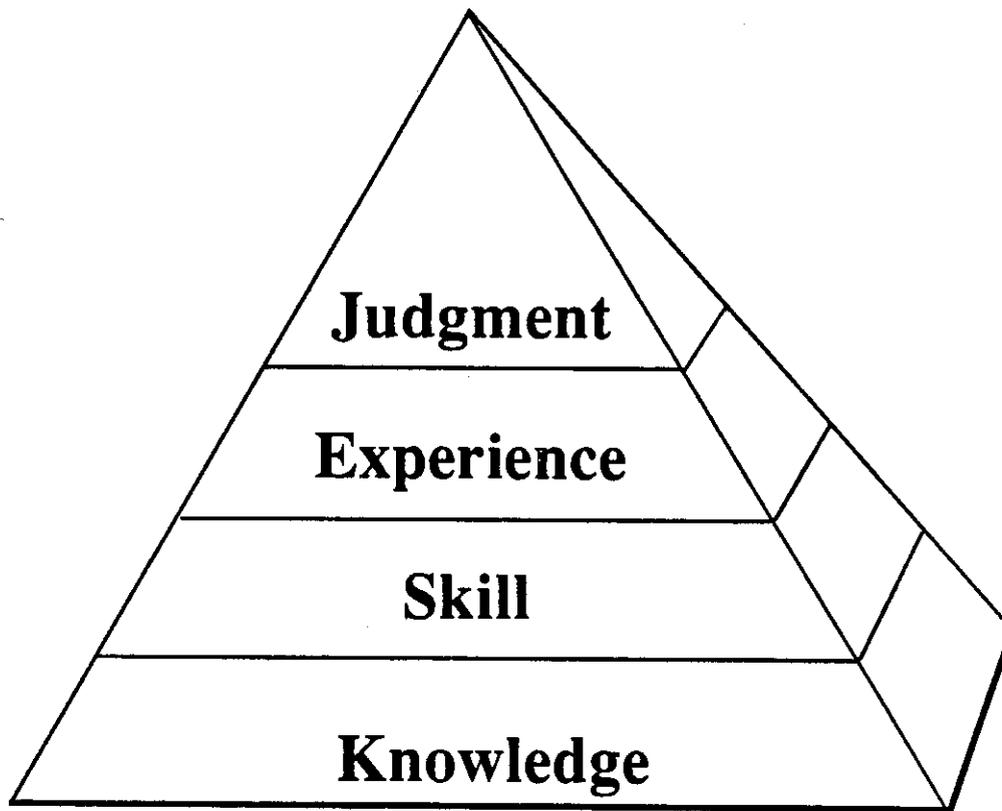


## accident prevention program

### Introduction to Pilot Judgment



# PILOT RESPONSIBILITY

When the government certificates a pilot, it is granting that pilot the privilege to use public airspace and air navigation facilities. In accepting this privilege, the pilot is expected to adhere to the rules without engaging in any activities which might infringe on the rights and safety of others. At all times it's the pilot's responsibility to operate an aircraft safely, legally, and carefully.

Further, the pilot in command always has direct responsibility for the operation of his aircraft, a responsibility not shared with anyone else—not with controllers, passengers, or flight instructors. Awesome as these responsibilities are, they are not spelled out in detail in any official document. When certificated, a pilot is expected to use his "good judgment" to understand and interpret the rules in individual situations and in the most responsible manner. However, accident statistics seem to indicate that pilots unfortunately fail to live up to that expectation. Nearly 90 percent of general aviation accidents may be attributed in part or in whole to pilot error—including poor judgment. We can see, then, why the exercise of good judgment is so critical to flying safely.

## WHAT IS JUDGMENT?

Judgment is not easily defined. One definition is that judgment is good, common "sense" as applied to the making of decisions, especially correct decisions. "Sense" relates to an intense awareness, realization, and understanding of all the factors which are involved in making a correct decision. Sense is generally applied to a person's ability to act effectively and positively in any given situation.

A most significant aspect of pilot judgment is an outcome. Judgment is not an end in itself but involves both a decision to act and a response—be it an action or even an inaction. In making a decision, pilots must consider all relevant intrapersonal, aircraft, and environmental factors which have, or may have, an influence upon his or her decision making process. Pilot judgment is thus a process which produces a thoughtful, considered decision relating to the aircraft's operation along with an inseparable response (i.e., action/inaction) to that decision.



A safe pilot consistently makes good judgments. What is good judgment? It's the ability to make an "instant" decision, which assures the safest possible continuation of the flight. But judgment may often be a series of evaluations, made over a period of minutes, hours, or even longer, that keeps you out of danger.

Good judgment guarantees the positive aspects of flying—the freedom to walk to your aircraft, go flying, and return home safely. Good judgment is an intangible component of flying which enhances safety. Good judgment can be the lifesaving edge in the midst of an unforeseen situation.

While general aviation flying is a safe mode of transportation, accident statistics indicate that the vast majority of accidents involve pilot error. In fact, most pilots who enjoy the adventure of flying recognize that certain risks are involved. Airmen who are either unaware of the potential hazards or who actually relish the opportunity to take unnecessary risks are those likely to be involved in judgment-error accidents.

Through education and experience, pilots and pilots-to-be can learn good judgment just as thoroughly as they learn the mechanical concepts and basic skills of flying. In fact, learning judgment is just as much an important part of flying as learning to make good takeoffs and landings.

Taking the viewpoint, then, that good pilot judgment is a process which involves thoughtful consideration and an outcome, a definition emerges:

*Pilot judgment is the process of recognizing and analyzing all available information about oneself, the aircraft, and the flying environment followed by the rational evaluation of alternatives to*

*implement a timely decision which maximizes safety. Pilot judgment thus involves one's attitudes toward risk-taking and one's ability to evaluate risks and make decisions based upon one's knowledge, skills, and experience. A judgment decision always involves a problem or choice, an unknown element, usually a time constraint, and stress.*

---

## JUDGMENT CONCEPTS

The following material contains concepts and terms which are used throughout this text. They have been especially designed to lead you to think more carefully about your flight activities and to guide you toward exercising better pilot judgment.

### Three Subject Areas

There is no need to memorize a lot of material in order to improve your judgment. However, you must learn the meanings of a few terms. The first is **SUBJECT AREA**. Subject area refers to the subject about which a judgment is made. In aviation there are three judgment subject areas:

- Pilot - "P"
- Aircraft - "A"
- Environment - "E"

---

## P Pilot

Pilots are continually making judgments about their own competency, state of health, level of fatigue, and many other variables. Any time the problem focuses on the pilot, we include it under the subject area **PILOT**. Example:

*The pilot had only 4 hours of sleep the night before. A friend then asked the pilot to fly him to a meeting in a town 700 miles away. Using good judgment about his fatigue, the pilot said no.*

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---

## A Aircraft

Decisions are frequently based on judgments about the aircraft, such as its power, equipment, or airworthiness. Any judgment about the airplane and its equipment is lumped into the subject area **AIRCRAFT**. Example:

*During preflight, the pilot noticed the fuel cap did not seem to lock securely. The pilot decided to delay takeoff while a mechanic checked the situation. The pilot's good judgment was confirmed when the mechanic had to install a new cap.*

---

## E Environment

Although the aircraft subject area is really part of the pilot's environment, we separate it because it is such a critical and frequent focus of judgment. Everything else besides the aircraft is the subject area **ENVIRONMENT**. Example:

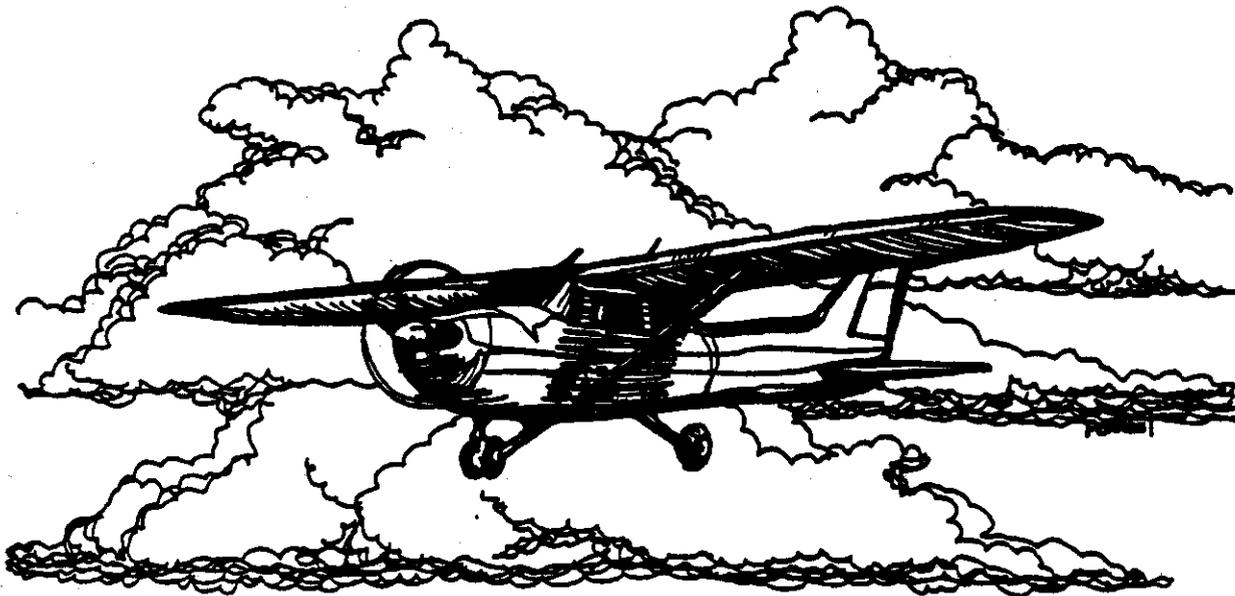
*The pilot was landing a small, single-engine plane just after a helicopter had departed. The pilot assumed that turbulence would not be a problem, but the plane slammed into the runway due to vortices from the helicopter.*

---

Judgment decisions often combine pilot-aircraft-environment. Example:

### Pilot/Environment—P/E

*With a 90-degree, 30-knot left crosswind (E), the pilot attempted to make a landing. The pilot's left leg was in a cast (P), and he had trouble using the rudder. Upon touchdown, the aircraft veered sharply to the right and collided with an embankment.*



## The Poor Judgment (PJ) Behavior Chain...an Introduction

Most aircraft accidents result from a combination of circumstances rather than from a single cause. In reality, accidents are the result of a chain of causes, involving a variety of pilot-aircraft-environment factors and occurring as a series of errors in judgment, called the **POOR JUDGMENT BEHAVIOR CHAIN** or **PJ CHAIN**.

For example:

*A noninstrument rated pilot, with limited experience flying in adverse weather, wants to arrive at his destination by a certain time, and he is already 30 minutes late. In spite of his weather inexperience, he decides to fly through an area of possible thunderstorms and will reach this area just before dark. Arriving in the thunderstorm area, he encounters lightning, turbulence, and heavy clouds. Night is approaching, and the thick cloud cover makes it very dark. In the darkness and turbulence, the pilot became spatially disoriented because he failed to trust his instruments.*

This pilot has made several errors in judgment. First, he let his desire to arrive at his destination on time override his concern for a safe flight. Then, he overestimated his flying abilities and decided to use a route that took him through a potential area of thunderstorm activity. Next, the pilot pressed on into obviously deteriorating conditions instead of changing course or landing prior to his destination.

The disastrous results, however, need not have been a foregone conclusion. The pilot could have broken the PJ Chain at any time, but he did not. Good judgment would

have meant flying around the adverse weather and accepting the fact that he might be late. Even once in the bad weather, good judgment could have led the pilot to decide to avoid flying into clouds and turbulence. And, finally before becoming disoriented in the dark, the pilot could have used good judgment to calm himself and rely on his instruments.

## Principles of the PJ Chain

- One poor judgment increases the probability that another will follow. Judgments are based on information the pilot has about himself, the aircraft, and the environment, and the pilot is less likely to make a poor judgment if this information is accurate. Thus, one poor judgment increases the availability of false information which may then negatively influence judgments that follow.
- As the PJ Chain grows, the alternatives for safe flight decrease. If a pilot selects only one alternative among several, the option to select the remaining alternatives may be lost. For example, if a pilot makes a poor judgment and flies into hazardous weather, the alternative to circumnavigate the weather is automatically lost.

## Breaking the PJ Chain

Since pilot judgment is a mental process, pilots can be trained—or even retrained if necessary—to use good judgment in the first place or to stop the influence of poor judgment. Breaking PJ Chain in itself is an act of good pilot judgment.

# The Three Mental Processes of Safe Flight

Before learning about these processes, do these short drills which will help you understand the explanations which follow.

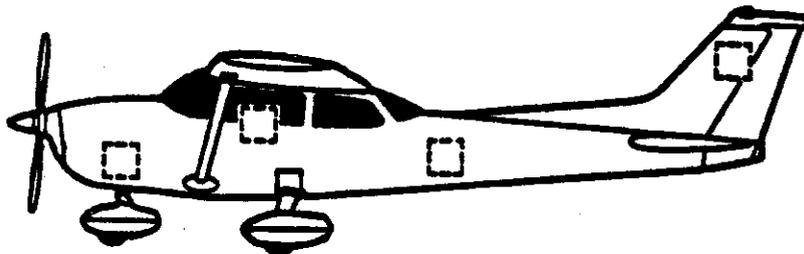
## Drill 1

Write your signature.

---

## Drill 2

Wherever you see the dotted "box" symbol in the picture below write the character "S" inside. Try to reproduce the character exactly.



## Drill 3

*This Drill requires you to use your knowledge about an aircraft's center of gravity (CG). Some of you may still be new enough to aviation that you don't know what "center of gravity" means. Simply defined, the CG is an imaginary point where all the aircraft's weight is considered to be concentrated.*

In flight, the wings support the entire aircraft. It is very important that the safe support zone of the wings contains the CG. This safe support zone is called the center of gravity range or CG range. The extreme ends of the CG range are called forward CG limit and aft CG limit.

Since aircraft balance is so important to safe flight, aircraft manufacturers always provide at least one means whereby the pilot can accurately locate the aircraft's CG. One method is a series of computations which amount to working a physics problem. However, most manufacturers provide the pilot with either a graph or a chart that makes finding the CG relatively easy.

**TRY TO DETERMINE WHERE THE CG MIGHT BE ON THE AIRPLANE ILLUSTRATION IN DRILL 2. DO NOT BE CONCERNED THAT YOU HAVE LITTLE INFORMATION TO GO ON. JUST THINK CAREFULLY AND LOGICALLY ABOUT HOW TO SOLVE THIS PROBLEM, THEN DRAW A HEAVY DOT ON THE AIRPLANE'S FUSELAGE TO INDICATE YOUR ANSWER.**

## Review

Your mental activities while doing the three drills were typical of the three mental processes of safe flight.

### Drill 1—Automatic Reaction

Did you know that the average signature requires about 40 changes in the direction of the signer's pen? Did you stop and think about changing direction that many times when you did the exercise? Chances are you did not. You automatically signed your name without thinking about exactly how you were doing it. You performed a rather complex activity without much consideration. Your response was automatic. The first mental process of safe flight is **AUTOMATIC REACTION**. Automatic reaction is used to maintain ongoing control of the aircraft, such as stabilizing heading and altitude, by making small, automatic adjustments to the controls. It may also be used in certain emergency situations where specific, prompt action is required.

Good pilots learn to do many things automatically, simultaneously, and without thinking about each individual act. Your flight instructor will identify skills and procedures which must become automatic reactions. He will teach you these skills by first giving you demonstrations and directions. Gradually, with practice, you will realize the decline and elimination of your need to "think about" what to do as these skills become truly automatic reactions.

### Drill 2—Problem Resolving

Did the character cause you some problem at first? Did it help you to realize this character is actually an inverted figure "5"? Most people find it helpful to think through a new situation before actually trying to do anything. Also, learning usually takes place more quickly when a connection or an association is realized between the new information and something already learned. Was there a point in the drill when you began making the character almost automatically, much as you did your signature? You probably became very good at making the character with little or no thought by the time you finished the drill.

Drill 2 gave you something to do that required you to understand what needed to be done and then figure out how to do it. Once you knew how, you went ahead and did what was required. This second mental process of safe flight is **PROBLEM RESOLVING**, which can be thought of as a three-step process:

- Step 1: Uncover, define, and analyze the problem.*
- Step 2: Consider the methods and outcomes of possible solutions.*
- Step 3: Apply the selected solution to the best of your ability.*

Your ability to reproduce the character in Drill 2 probably improved with practice. Similarly, as you work with your flight instructor, you will find that as you gain proficiency, you can also resolve flight problems more easily and more quickly. Remember, problem resolving is different from automatic reaction in that you actually work through a process instead of just acting.

### Drill 3—Repeated Reviewing

Did you notice that three things regarding printing style were changed within the text of Drill 3? Check your observations against this list:

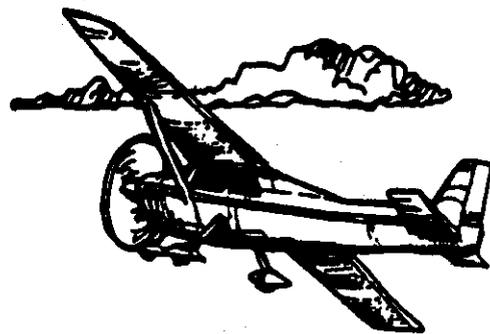
1. Each paragraph is indented differently.
2. Each paragraph is printed in a different style of type.
3. Only the fourth paragraph is printed in all capitals.

If you are like most people, you skimmed through the text of Drill 3 to get the information you needed to do the exercise. You were not really alert to changes in the way that the printer presented the information. However, when your attention was directed to the printing you easily recognized them all.

It is much more probable you will find something when you are consciously looking for it than when you are not. This is called **REPEATED REVIEWING**, which is the third mental process.

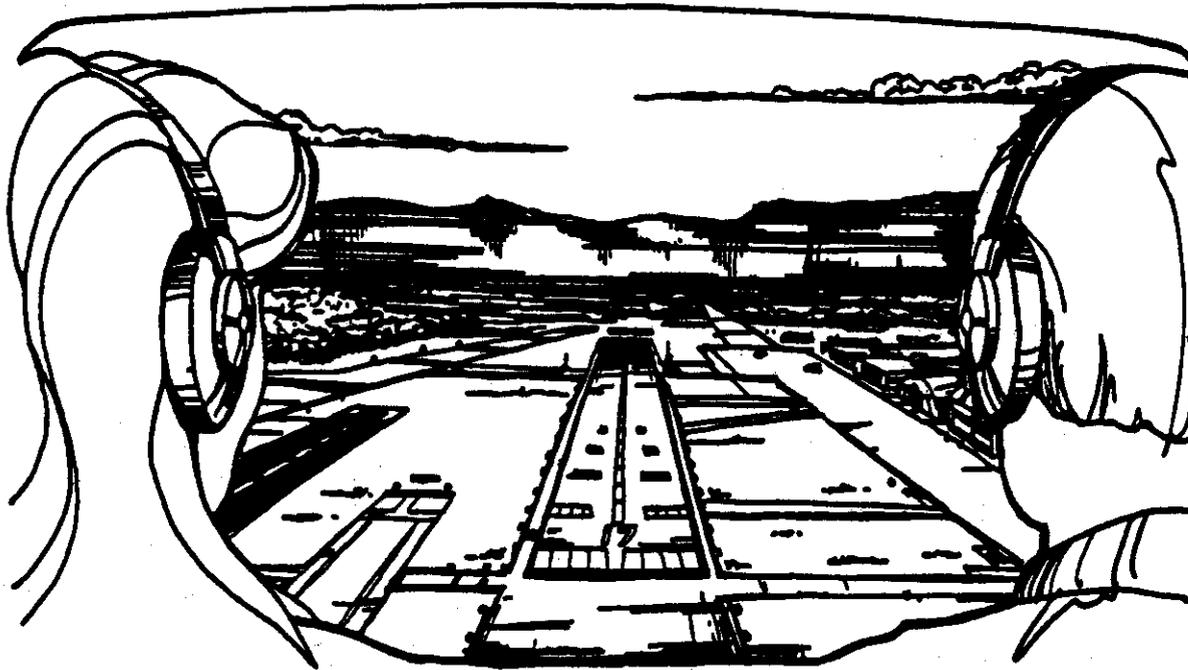
Repeated reviewing means that you are continuously trying to find or anticipate situations which may require problem resolving or automatic reaction. Recognizing feedback regarding PJ chains is also a part of repeated reviewing.

In an aircraft, almost anything is subject to change and to change quickly. These changes can occur in any of the three subject areas, including the weather (E), aircraft performance (A), or the pilot's physical and mental state (P). Only by repeated reviewing can a pilot be constantly aware of all conditions that contribute to safe flight or that have the potential of leading to disaster.



## The Three Mental Processes of Safe Flight

1. **AUTOMATIC REACTION**—used to maintain ongoing control of the aircraft and, also, to respond to certain types of emergencies.
2. **PROBLEM RESOLVING**—used to overcome undesirable situations by means of a systematic process.
3. **REPEATED REVIEWING**—keeps you constantly aware of all the factors that may be changing in your environment that could affect safety of flight.



# Self-Assessment of Hazardous Attitudes

Now you will learn about the five hazardous attitudes affecting pilot judgment and how to understand these attitudes as they apply to your flying. Later, you will learn ways to limit your own hazardous attitudes and the effects of high stress.

As a first step, you are now to take a self-assessment inventory to give you a personal insight for the following discussions and training.

This assessment asks you to decide why you, as a pilot, might have made certain decisions. Ten situations will

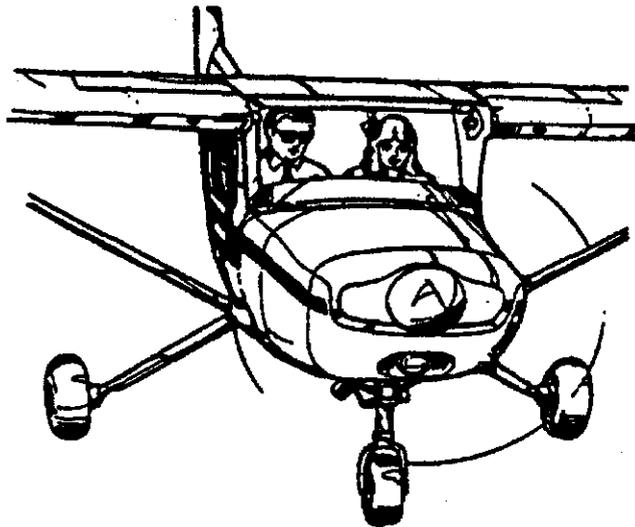
be presented, each involving a flight decision. After each situation, you will find a list of five possible reasons for a decision. No "correct" answer is provided for any of the 10 situations. You may indeed be correct in believing that a safe pilot would not choose any of the five alternatives. Be assured that most people know better than to act as described in the situations. Just recognize that the inventory presents extreme cases of incorrect pilot decision making to help introduce you to the five special types of hazardous thinking described later.

## Instructions: Assessment Inventory

1. First, remove the white answer sheet from the back of this book.
2. Read over each of the situations and the five choices. Decide which one is the most likely reason why you might make the choice that is described. Place a numeral 5 in the space provided on the answer sheet.
3. Continue by placing a numeral 4 by the next most probable reason, and so on, until you have filled in all five blanks with ratings of 5, 4, 3, 2, and 1.
4. Do all 10 situations and fill in each blank, even though you may disagree with the choices listed. Remember, there are no correct answers.

### EXAMPLE:

- a. 1 (your least likely response)
- b. 3
- c. 5 (your most likely response)
- d. 2
- e. 4



# Assessment Inventory

## Situation 1

You are on a flight to an unfamiliar, rural airport. The Flight Service Station (FSS) states that Visual Flight Rules (VFR) flight is not recommended because heavy coastal fog is forecast to move into the destination airport area about the time you expect to land. You first consider returning to your home base where visibility is still good but decide instead to continue as planned. You land safely after experiencing some problems. Why did you decide to continue?

- You hate to admit that you cannot complete your original flight plan.
- You resent the suggestion by FSS that you should change your mind.
- You feel sure that things will turn out safely, that there is no danger.
- You reason that since your actions would make no real difference, you might as well continue.
- You feel the need to decide quickly so you take the simplest alternative.

## Situation 2

While taxiing for takeoff, you notice that your right brake pedal is softer than the left. Once airborne, you are sufficiently concerned about the problem to radio for information. Since strong winds are reported at your destination, an experienced pilot who is a passenger recommends that you abandon the flight and return to your departure airport. You choose to continue the flight and experience no further difficulties. Why did you continue?

- You feel that suggestions made in this type of situation are usually overly cautious.
- Your brakes have never failed before, so you doubt that they will this time.
- You feel that you can leave the decision to the tower at your destination.
- You immediately decide that you want to continue.
- You are sure that if anyone could handle the landing, you can.

## Situation 3

Your regular airplane has been grounded because of an airframe problem. You are scheduled in another airplane and discover it is a model you are not familiar with. After your preflight, you decide to take off on your business trip as planned. What was your reasoning?

- You feel that a difficult situation will not arise so

there is no reason not to go.

- You tell yourself that if there were any danger, you would not have been offered the plane.
- You are in a hurry and do not want to take the time to think of alternate choices.
- You do not want to admit that you may have trouble flying an unfamiliar airplane.
- You are convinced that your flight instructor was much too conservative and pessimistic when he cautioned you to be thoroughly checked out in an unfamiliar aircraft.

## Situation 4

You were briefed about possible icing conditions but did not think there would be any problem since your departure airport temperature was 60°F. As you near your destination, you encounter freezing precipitation which clings to your aircraft, and your passenger, who is a more experienced pilot, begins to panic. You consider turning back to the departure airport but continue instead. Why did you not return?

- You feel that having come this far, things are out of your hands.
- The panic of the passenger makes you "commit yourself" without thinking the situation over.
- You do not want the passenger to think you are afraid.
- You are determined not to let the passenger think he can influence what you do.
- You do not believe that the icing could cause your plane to crash in these circumstances.

## Situation 5

You do not bother to check weather conditions at your destination. En route, you encounter headwinds. Your fuel supply is adequate to reach your destination, but there is almost no reserve for emergencies. You continue the flight and land with a nearly dry tank. What most influenced you to do this?

- Being unhappy with the pressure of having to choose what to do, you make a snap decision.
- You do not want your friends to hear that you had to turn back.
- You feel that flight manuals always understate the safety margin in fuel tank capacity.
- You believe that all things usually turn out well, and this will be no exception.
- You reason that the situation has already been determined because the destination is closer than any other airport.

## Assessment Inventory (cont.)

### Situation 6

You are 40 minutes late for a trip in a small airplane, and since the aircraft handled well on the previous day's flight, you decide to skip most of the preflight check. What leads you to this decision?

- a. You simply take the first approach to making up time that comes to mind.
- b. You feel that your reputation for being on time demands that you cut corners when necessary.
- c. You believe that some of the preflight inspection is just a waste of time.
- d. You see no reason to think that something unfortunate will happen during this flight.
- e. If any problems develop, the responsibility would not be yours. It is the maintenance of the airplane that really makes the difference.

### Situation 7

You are to fly an aircraft which you know is old and has been poorly maintained. A higher than normal RPM drop on the magneto check is indicated, and you suspect the spark plugs. Your friends, who are traveling as passengers, do not want to be delayed. After 5 minutes of debate, you agree to make the trip. Why did you permit yourself to be persuaded?

- a. You feel that you must always prove your ability as a pilot, even under less than ideal circumstances.
- b. You believe that regulations overstress safety in this kind of situation.
- c. You think that the spark plugs will certainly last for just one more flight.
- d. You feel that your opinion may be wrong since all the passengers are willing to take the risk.
- e. The thought of changing arrangements is too annoying, so you jump at the suggestion of the passengers.

### Situation 8

You are on final approach when you notice a large unidentified object on the far end of the runway. You consider going around, but your friend suggests landing anyway since the runway is "plenty long enough." You land, stopping 200 feet short of the obstacle. Why did you agree to land?

- a. You have never had an accident, so you feel that nothing will happen this time.
- b. You are pleased to have someone else help with the decision and decide your friend is right.

- c. You do not have much time, so you just go ahead and act on your friends's suggestion.
- d. You want to show your friend that you can stop the plane as quickly as needed.
- e. You feel that the regulations making the pilot responsible for the safe operation of the aircraft do not apply here since it is the airport's responsibility to maintain the runway.

### Situation 9

You have just completed your base leg for a landing on runway 14 at an uncontrolled airport. As you turn to final, you see that the wind has changed, blowing from about 90°. You make two sharp turns and land on runway 11. What was your reasoning?

- a. You believe you are a really good pilot who can safely make sudden maneuvers.
- b. You believe your flight instructor was overly cautious when insisting that a pilot must go around rather than make sudden course changes while on final approach.
- c. You know there would be no danger in making the sudden turns because you do things like this all the time.
- d. You know landing into the wind is best, so you act as soon as you can to avoid a crosswind landing.
- e. The unexpected wind change is a bad break, but you figure if the wind can change, so can you.

### Situation 10

You have flown to your destination airfield only in daylight and believe that you know it well. You learn that your airplane needs a minor repair which will delay your arrival until well after dark. Although a good portion of the flight is after dark, you feel that you should be able to recognize some of the lighted landmarks. Why did you decide to make the flight?

- a. You believe that when your time comes you cannot escape, and until that time there is no need to worry.
- b. You do not want to wait to study other options, so you carry out your first plan.
- c. You feel that if anyone can handle this problem, you can do it.
- d. You believe that the repair is not absolutely necessary. You decide you will not let the needed minor maintenance stop you from getting to your destination.
- e. You simply do not believe that you could get off course despite your unfamiliarity with ground references at night.

## The Five Hazardous Attitudes

1. **Anti-Authority:**  
"Don't tell me!"

This attitude is found in people who do not like anyone telling them what to do. They think, "Don't tell me!" In a sense, they are saying "No one can tell me what to do." The person who thinks, "Don't tell me," may either be resentful of having someone tell him/her what to do or may just regard rules, regulations, and procedures as silly or unnecessary. However, it is always your prerogative to question authority if you feel it is in error.
2. **Impulsivity:**  
"Do something—quickly!"

This is the attitude of people who frequently feel the need to do something, anything, immediately. They do not stop to think about what they are about to do; they do not select the best alternative—they do the first thing that comes to mind.
3. **Invulnerability:**  
"It won't happen to me."

Many people feel that accidents happen to others but never to them. They know accidents can happen, and they know that anyone can be affected; but they never really feel or believe that they will be the involved. Pilots who think this way are more likely to take chances and run unwise risks, thinking all the time, "It won't happen to me!"
4. **Macho:**  
"I can do it."

People who are always trying to prove that they are better than anyone else, think, "I can do it!" They "prove" themselves by taking risks and by trying to impress others. While this attitude is thought to be a male characteristic, women are equally susceptible.
5. **Resignation:**  
"What's the use?"

People who think, "What's the use?" do not see themselves as making a great deal of difference in what happens to them. When things go well, they think, "That's good luck." When things go badly, they attribute it to bad luck or feel that someone is "out to get them." They leave the action to others—for better or worse. Sometimes such individuals will even go along with unreasonable requests just to be a "nice guy."

## Scoring Instructions for Assessment Inventory

Now that you have completed taking the inventory, the next step is to score it to determine your profile. You will need to use your answer sheet (page 8), the scoring keys on pages 14 through 16, and the profile graph on page 16.

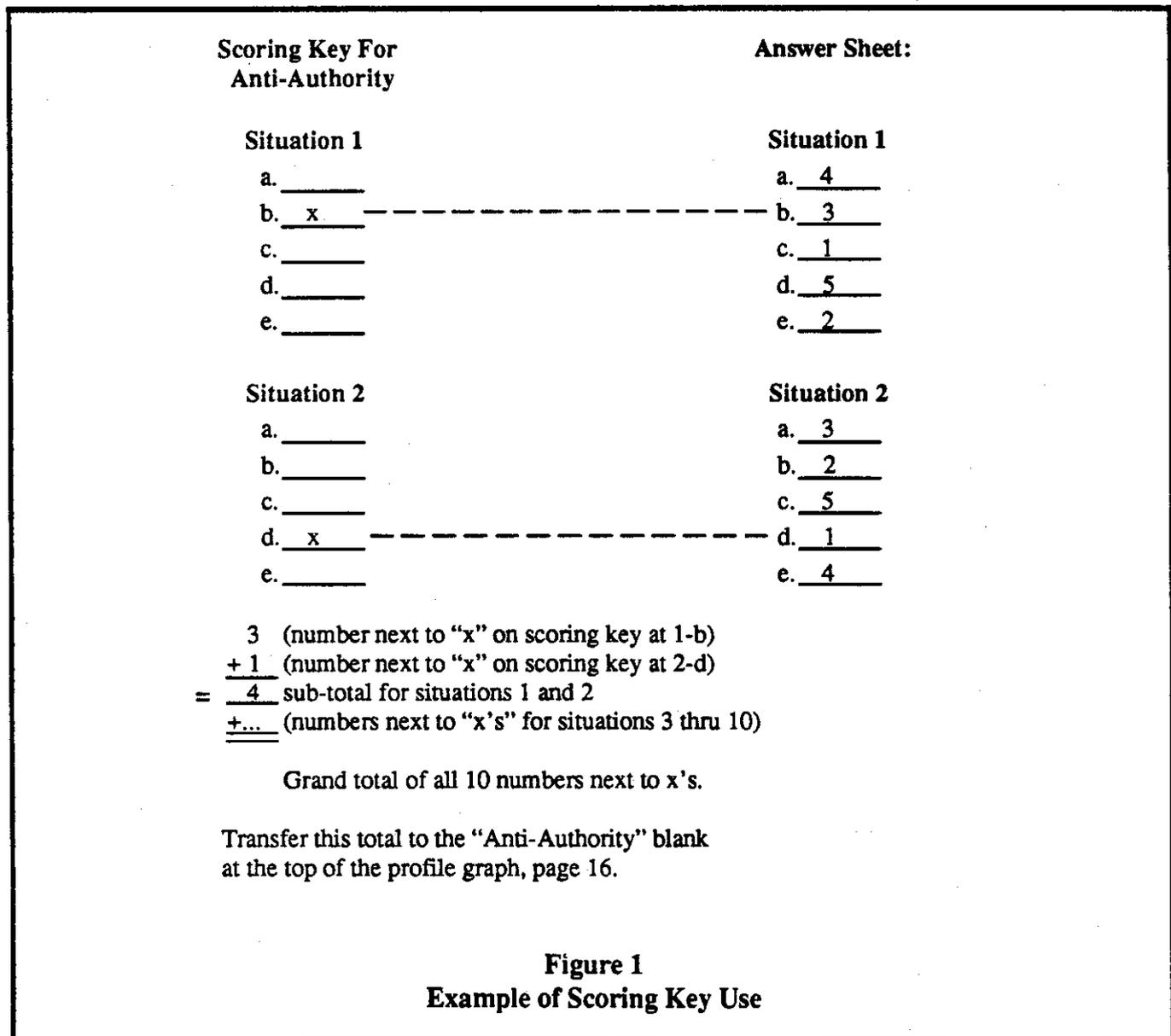
1. Place the left side of the answer sheet on top of the first scoring key (Anti-Authority, page 14) so that it is lined up with the scoring key blanks for situations 1 through 5. Add the numbers written on your answer sheet which appear next to the "x's" on the scoring key. Keep these totals on a separate piece of paper.

2. When you have done this for situations 1 through 5, move the answer sheet so that its right edge now lines up with the blanks for situations 6 through 10. Add the numbers next to the "x's" for the situations 6 through 10 to the first total which you recorded on a separate piece of paper.

3. Write this sum on the top of the profile graph (page 16).

4. Repeat this procedure for all five scoring keys.

See Figure 1 for an example of the use of the scoring key.



**Figure 1**  
**Example of Scoring Key Use**

**Scoring Key For  
Impulsivity**

- Situation 1  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d.   x    
e. \_\_\_\_\_
- Situation 2  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d.   x    
e. \_\_\_\_\_
- Situation 3  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 4  
a.   x    
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 5  
a.   x    
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 6  
a.   x    
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 7  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d.   x    
e. \_\_\_\_\_
- Situation 8  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 9  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d.   x    
e. \_\_\_\_\_
- Situation 10  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_

**Scoring Key For  
Anti-Authority**

- Situation 1  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 2  
a.   x    
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 3  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d.   x    
e. \_\_\_\_\_
- Situation 4  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c.   x    
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 5  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 6  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c.   x    
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 7  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 8  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d.   x    
e. \_\_\_\_\_
- Situation 9  
a. \_\_\_\_\_  
b.   x    
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_
- Situation 10  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c.   x    
d. \_\_\_\_\_  
e. \_\_\_\_\_

**Scoring Key For  
Invulnerability**

- Situation 1                      Situation 6  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 2                      Situation 7  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 3                      Situation 8  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 4                      Situation 9  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 5                      Situation 10  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.

**Scoring Key For  
Macho**

- Situation 1                      Situation 6  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 2                      Situation 7  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 3                      Situation 8  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 4                      Situation 9  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.
- Situation 5                      Situation 10  
a.                               a.   
b.                               b.   
c.                               c.   
d.                               d.   
e.                               e.

### Scoring Key For Resignation

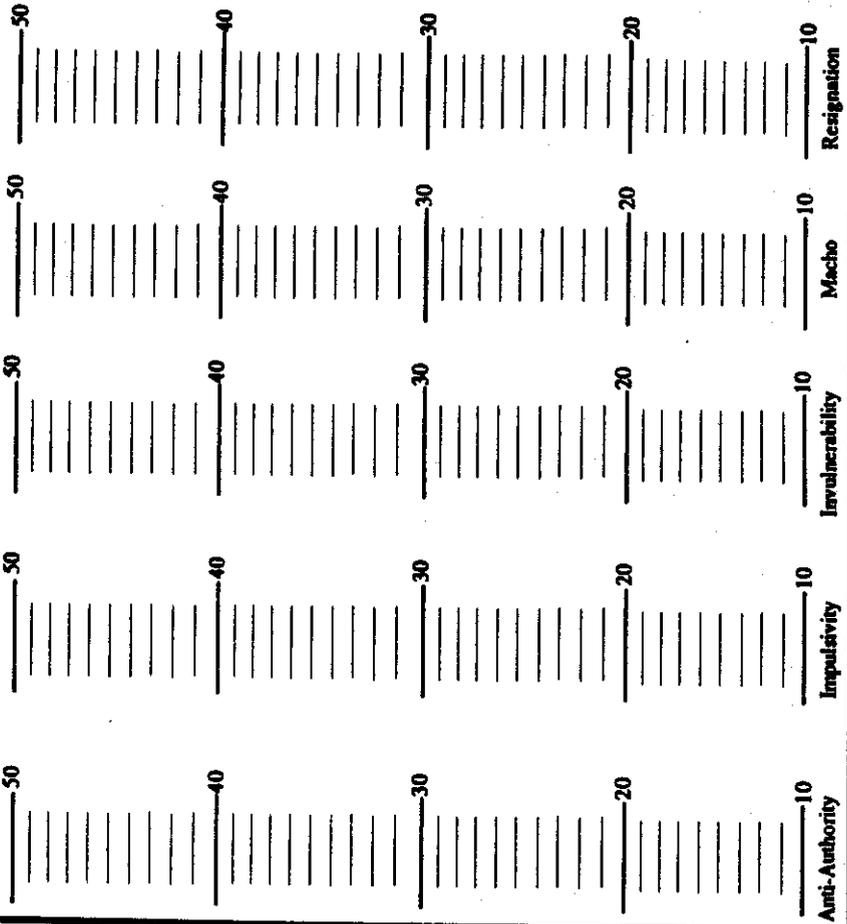
- Situation 1                      Situation 6  
 a. \_\_\_\_\_                      a. \_\_\_\_\_  
 b. \_\_\_\_\_                      b. \_\_\_\_\_  
 c. \_\_\_\_\_                      c. \_\_\_\_\_  
 d. X                                  d. X  
 e. \_\_\_\_\_                      e. \_\_\_\_\_
- Situation 2                      Situation 7  
 a. \_\_\_\_\_                      a. \_\_\_\_\_  
 b. X                                  b. \_\_\_\_\_  
 c. \_\_\_\_\_                      c. \_\_\_\_\_  
 d. \_\_\_\_\_                      d. X  
 e. \_\_\_\_\_                      e. \_\_\_\_\_
- Situation 3                      Situation 8  
 a. X                                  a. \_\_\_\_\_  
 b. \_\_\_\_\_                      b. X  
 c. \_\_\_\_\_                      c. \_\_\_\_\_  
 d. \_\_\_\_\_                      d. \_\_\_\_\_  
 e. \_\_\_\_\_                      e. \_\_\_\_\_
- Situation 4                      Situation 9  
 a. X                                  a. \_\_\_\_\_  
 b. \_\_\_\_\_                      b. \_\_\_\_\_  
 c. \_\_\_\_\_                      c. \_\_\_\_\_  
 d. \_\_\_\_\_                      d. \_\_\_\_\_  
 e. \_\_\_\_\_                      e. X
- Situation 5                      Situation 10  
 a. \_\_\_\_\_                      a. X  
 b. \_\_\_\_\_                      b. \_\_\_\_\_  
 c. \_\_\_\_\_                      c. \_\_\_\_\_  
 d. X                                  d. \_\_\_\_\_  
 e. \_\_\_\_\_                      e. \_\_\_\_\_

### Profile Graph

1. Enter the raw scores obtained from each scoring key in the correct blank space below. The sum of the five scores should equal 150. If it does not, go back and check your work.

Anti-Authority \_\_\_\_\_  
 Impulsivity \_\_\_\_\_  
 Invulnerability \_\_\_\_\_  
 Macho \_\_\_\_\_  
 Registration \_\_\_\_\_

TOTAL ..... 150



2. Now look at the profile form shown below. Notice that there are five columns, one for each of the raw scores. Place a mark on each line at the height that matches your score. Now draw lines connecting the five marks.

## Profile Explanation

You now have a profile graph which indicates the comparative strength of each of the five hazardous thought patterns for you. (Remember, your scores are confidential and need not be divulged to anyone!) The higher the relative number, the greater is your propensity to respond with that hazardous thought pattern. Keep your results in mind as you read further. Let us begin the explanation of your profile by describing an all-too-common flight situation.

---

*A pilot of a single-engine airplane checks the weather and notes that there is a possibility of a thunderstorm at his destination airport. He has never operated an aircraft in bad weather, and he knows that his flight instructor would advise him not to fly. Despite this, he takes off, crashes in poor weather, and seriously injures himself.*

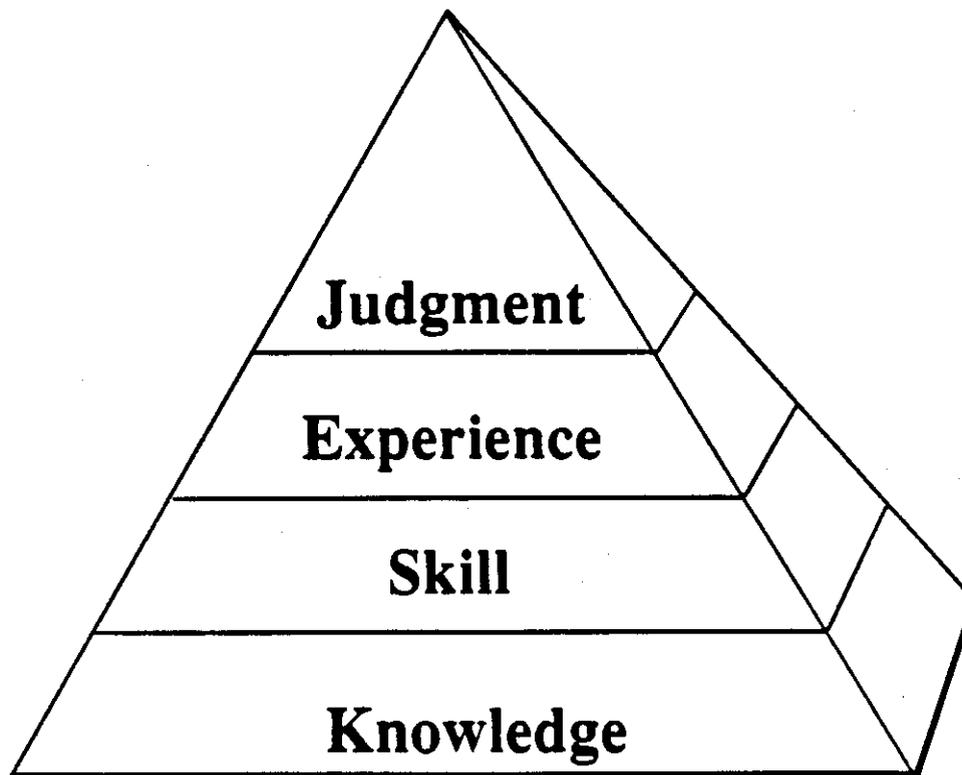
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Why does this occur so often? Because many accidents involve pilots who allow themselves to be influenced by one or more of the five basic hazardous thoughts. These thought patterns get pilots into trouble by causing them to take chances that invite accidents. (The five hazardous thoughts are the ones recorded on the assessment inventory which you just completed.)

## Summary

If you have not already done so, look back at your profile to see which hazardous thoughts most often matched your own thinking when you answered the questions. This shows which patterns you tend to use when your judgment becomes influenced by hazardous thinking. The inventory does not show that you are bound to act in the manner of one or more of the hazardous thoughts. Having thoughts similar to the ones described as hazardous is common and normal. But as you progress in your flight training, you will find yourself thinking fewer and fewer hazardous thoughts as you become able to identify and counteract them. The important thing to learn is to balance all your thoughts against possible outcomes so that you act only in a nonhazardous manner. A critical part of your judgment training, then, is learning to examine your own thinking and control hazardous thoughts. Whether you now engage in one or more of these thought patterns, often or only rarely, learning to control them will be worthwhile; you will become a safer pilot the less often you act upon a hazardous thought.

When you work on all five hazardous thoughts in the next section, pay particular attention to the ones on which you scored the highest. (Note: The next section is to be completed as soon as possible after you finish the self-assessment profile.)



# Antidotes for Hazardous Attitudes

Now you know there are five major hazardous attitudes which contribute to poor pilot judgment. This is an important first step in eliminating them from your decision making process. This next step is designed to teach you a way to counteract hazardous attitudes so that they do not affect your actions.

Since you cannot think about two things at once, one way to keep from thinking a hazardous thought is to think another thought. By telling yourself something

different from the hazardous thought, you're "taking an antidote" to counteract the hazardous thought. You remove a hazardous thought by substituting the antidote. Thus, if you discover yourself thinking, "It won't happen to me," mentally tell yourself, "That is a hazardous thought." Recognize it, correct it, and then say its antidotes to yourself.

To do this, you must **MEMORIZE THE ANTIDOTES**. Know them so well that they will automatically come to mind when you need them.

## THE FIVE ANTIDOTES

### Hazardous Attitude

### Antidote

#### **ANTI-AUTHORITY:**

"Don't tell me."

"Follow the rules. They are usually right."

#### **IMPULSITIVITY:**

"Do something-quickly!"

"Not so fast. Think first."

#### **INVULNERABILITY:**

"It won't happen to me."

"It could happen to me."

#### **MACHO:**

"I can do it."

"Taking chances is foolish."

#### **RESIGNATION:**

"What's the use?"

"I'm not helpless. I can make a difference."

# Identifying and Reducing Stress

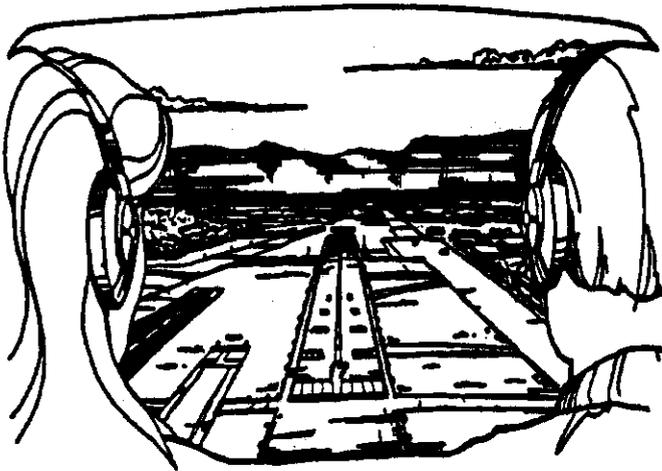
## What Is Stress?

Stress can be defined as the body's response to any demand made upon it by physical, physiological, or psychological factors known as stressors. Any internal or external stimulus that is perceived as a threat to the body's equilibrium causes a reaction as the body marshals its resources to cope with it. These reactions include the release of chemical hormones (such as adrenalin) into the blood and a marked increase in the metabolic rate which provides energy to the muscles. Blood is shunted away from the stomach and digestive tract to supply the muscles in the arms and legs with more oxygen. Blood sugar is increased. Heart rate, respiration, blood pressure, and perspiration all increase. Other hormones improve the blood's ability to clot. The result prepares the body to "fight or flee," a primordial physiological response to threat.

## What Are Stressors?

As mentioned before, stressors can be either physical, physiological, or psychological.

Physical stressors include conditions associated with the environment, such as temperature and humidity extremes, noise, vibration, and lack of oxygen. You have probably already encountered some or all of these in flight.



Physiological stressors include fatigue, lack of physical fitness, sleep loss, missed meals (leading to low blood sugar levels), and illness.

Psychological stressors are related to social or emotional factors such as a death in the family, a divorce, a sick child, a demotion, etc. Also, they may be related to mental workload such as analyzing a problem, navigating an aircraft, or making decisions.

When you need to consider only one thing at a time to reach a decision, you usually have no problem in making a decision. In flight, however, you frequently have to deal with many situations simultaneously and make numerous, interrelated decisions—often based on incomplete information and within a short span of time.

For instance, on a cross-country flight you realize you are much lower on fuel than you expected. The clouds ahead appear to be building. Static is interfering with your radio. You are off course and can't locate your current position on the sectional chart—all of a sudden a great deal to think about! On top of all this, you are tired, hungry, and have a full bladder. The cabin heater isn't working, and you have to contend with turbulence. You begin to worry about arriving at your destination on time and missing an important appointment. You are afraid of violating nearby restricted airspace, thus getting into trouble with the Government and having to file a report—maybe even having enforcement action taken against you. You contemplate a forced landing and begin to worry about damaging your aircraft. What if your insurance won't cover it? Can you afford the deductible? What about injury to yourself or your passengers? Your palms are sweating, your mouth is dry, and your heart is pounding!

At this point, you feel a growing sense of urgency and tension. Your thinking becomes confused, unfocused. You may give too much attention to "what if" questions which should be ignored. You are reaching (or have reached) a state of stress overload. You begin to use poor judgment that results in a series of bad decisions: pressing on into deteriorating weather, overflying good landing areas, and so on, until you are almost out of fuel. The stage is set for panic and disaster.

As you can see, there can be plenty of stressors to cope with in the flight environment itself without the added

burden of "life stressors" in the form of financial problems, job pressures, or family troubles; these can also be self-generated—a desire to obtain a promotion or to achieve recognition from peers. Moreover, stress effects are cumulative, eventually adding up to an intolerable burden unless adequately coped with.

Even those things in life you find pleasurable can be stressors since they represent changes in your environment with which you must deal. Everyone is stressed to some degree all the time. Indeed, it is a well-known fact that some people seek stress to make life more interesting, and a certain amount of stress is good for you. It keeps you on your toes and prevents complacency from setting in. Some stress helps prevent accidents.

## Relationship Between Stress and Performance

It was just noted that the effects of stress were cumulative; furthermore, that some amount of stress was desirable, but that higher stress levels, particularly over long periods of time, can adversely affect performance. Thus, performance will generally increase with the onset of stress but will peak and then begin to fall off rapidly as stress levels exceed your ability to cope.

At the lower stress levels, we will see boredom—followed by optimal performance at the moderate stress levels, followed ultimately by overload and panic at the highest stress levels. See Figure 2.

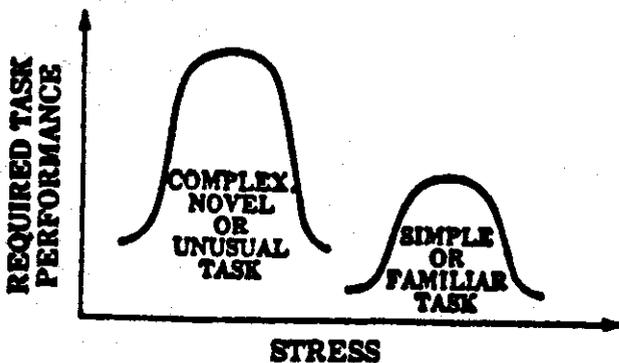


Figure 2  
Relationship of Stress and Performance

Complex or unfamiliar tasks require higher levels of performance than do simple or overlearned tasks. Furthermore, complex or unfamiliar tasks are also more subject to the adverse effects of increasing stress than are tasks which are simple or familiar. See Figure 3.

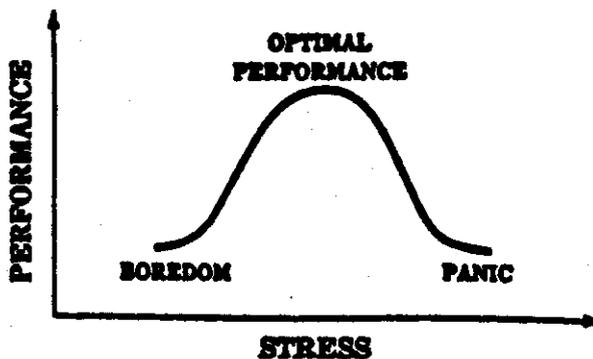


Figure 3  
Effects of Stress and Task Complexity on Performance

## Relationship Between Task Requirements and Pilot Capabilities

Accidents often occur when flying task requirements exceed pilot capabilities. Pilot capabilities can be adversely affected by a variety of stresses, such as fatigue, alcohol, emotional problems, etc. The difference between pilot capabilities and task requirements as shown in Figure 4 is called the "margin of safety." Note that in this idealized example, the margin of safety is minimal during the approach. Had any emergency or distraction occurred, or anything else further degraded pilot capabilities, an accident may have occurred.

## Health Effects of High Stress Levels

Whether you perceive life's many changes as good or bad, they still impose stress. Remember, stress is cumulative, and if it exceeds your ability to cope, you may become ill or accident-prone. As your body is continually assaulted by stressors, it tries to adjust, leaving you in a constant state of "fight or flee." In most stressful situations in today's modern society, you can't fight back or run away, and the changes in your body may actually be harmful. The chemicals in your bloodstream, when not allowed to do the job they were meant to do, can lead to a deterioration of your body's physiological defense mechanisms, causing heart attacks, arthritis, ulcers, high blood pressure, and diseases of the respiratory system, as well as other physical problems.

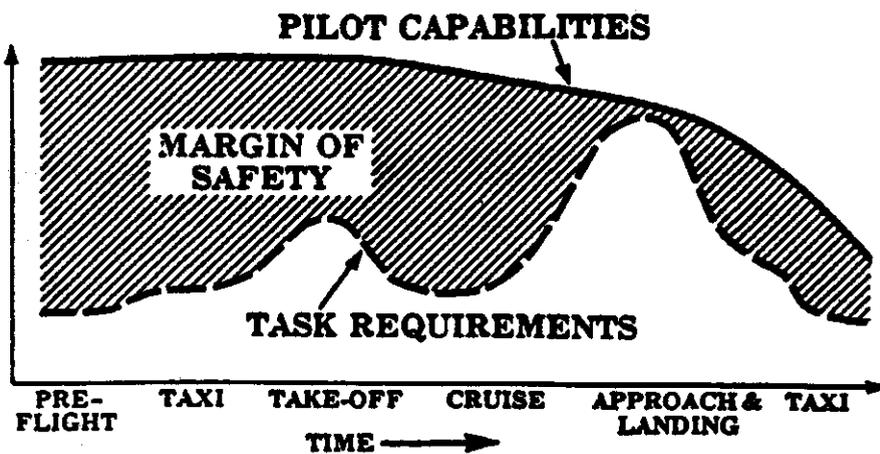


Figure 4  
Task Requirement Versus Pilot Capabilities

## Coping With Stress

As you mature and adapt to life's many stressors, you learn to cope. There is a limit, however, to the amount of stress you can handle, and this varies from individual to individual and within the same individual over a lifetime—or even in just a few hours. As you grow in experience, you may be able to handle more stress, but if you continue to accumulate stress beyond your ability to cope, you will eventually reach a state of exhaustion and become ill.

As we said before, stress handling techniques vary considerably. An individual's personal strategies for dealing with stress may be healthy and adequate in coping with various life problems, or they may be inappropriate and lead to an increased burden through self-imposed stress.

## Inadequate Stress-Coping Strategies

The inadequate strategies employed by most people in trying to cope with stress often impose more stress. When this happens people can develop anxieties and become frustrated. Frustration, in turn, often leads to anger and aggression. That anger may be directed at other people or turned inward, showing up as self-destructive behavior which may take subtle forms and have the same result without the individual's conscious awareness of self-destructive tendencies: overeating

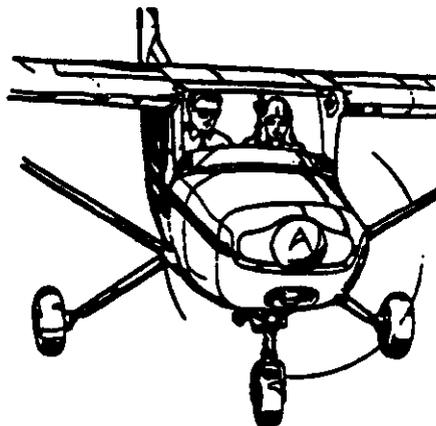
(leading to obesity), smoking too much, alcoholism and drug abuse; or it may take the form of risk-taking and accidents. When the individual directs anger toward others, the resulting problems with interpersonal relationships lead to loss of friends, trouble with the boss, marital problems, divorce, child abuse, assault, and even homicide. Aggression directed at inanimate objects can lead to damage and injury that show up as accidents.

## Symptoms to Look For

Individuals who are overstressed (not coping adequately) often show symptoms in three ways: emotional, physical, and behavioral. These symptoms differ depending upon whether aggression is focused inward or outward. Those individuals who typically turn their aggressive feelings inward often demonstrate the emotional symptoms of depression, preoccupation, sadness, and withdrawal. Physical symptoms may show up as headaches, insomnia, appetite changes, weight gain or loss, indigestion, nausea, vomiting, diarrhea, and constipation. Behavioral symptoms include a morbid preoccupation with illness (hypochondria), self-medication, a reluctance to accept responsibility, tardiness, absenteeism, and poor personal appearance and hygiene.

The individual who typically takes out frustration on other people or objects will, on the other hand, show few physical symptoms. Emotional symptoms may show up as overcompensation, denial, suspicion, paranoia, agita-

tion, restlessness, defensiveness, excess sensitivity to criticism, argumentativeness, arrogance, and hostility. Behavioral symptoms include episodes of desperate "acting out" or temper tantrums (a disguised cry for attention). These individuals also tend to abuse alcohol and drugs, but, in addition, they get into fights, incur numerous traffic tickets, gamble, fall into indebtedness, and may even become child or spouse abusers. They also tend to be accident-prone.



## Making Go/No-Go Decisions Before Flight

Most pilots give their aircraft a thorough preflight, yet many forget to preflight themselves. We suggest you use the "I'M SAFE" checklist before you decide to fly.

Are You Fit to Fly? The "I'M SAFE" Checklist	
<b>I</b> — Illness?	Do I have any symptoms? _____
<b>M</b> — Medication?	Have I been taking prescription or over-the-counter drugs? _____
<b>S</b> — Stress?	Am I under psychological pressure from the job? Worried about financial matters, health problems, or family discord? _____
<b>A</b> — Alcohol?	Have I been drinking within 8 hours? Within 24 hours? _____
<b>F</b> — Fatigue?	Am I tired and not adequately rested? _____
<b>E</b> — Eating?	Am I adequately nourished? _____

And Remember . . . .

*"A superior pilot uses his superior judgment to avoid stressful situations which might call for the use of his superior skills."*

Anon

# Assessment Inventory

## Answer Sheet

Remove this answer sheet.

### Situation 1

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 2

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 3

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 4

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 5

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 6

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 7

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 8

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 9

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

### Situation 10

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

