

# ATARI<sup>®</sup> PROGRAM exchange

## 747 LANDING SIMULATOR by William J. Graham

INSTRUCTIONS

USER-WRITTEN SOFTWARE FOR ATARI PERSONAL COMPUTER SYSTEMS

APX-10043

APX-20043



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# 747 LANDING SIMULATOR

by

William J. Graham

INSTRUCTIONS

9/1/81

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## INTRODUCTION

### OVERVIEW

747 LANDING SIMULATOR is a game that realistically simulates the airport runway approach and landing of a jet airliner, with you, as the pilot, responsible for landing your aircraft safely.

You view the runway approach from the cockpit, with the instrument panel displaying on the lower third of your TV screen. Your view of the airport runway and horizon is in true perspective during your approach and landing. Your instrument displays are continuously updated. Air traffic control flashes the runway lights on and off for your guidance and the apparent brightness of these runway lights increases realistically as your aircraft approaches.

The simulated air turbulence you hear during your flight varies with changes in airspeed. You're alerted to various conditions during your flight by both warning signals and sound effects (including crashes!). When you land perfectly, you hear your engines decelerate as you reverse them, until your aircraft rolls to a stop.

You receive a score at the end of your flight, which reflects not only your expertise in landing your aircraft safely, but also the overall quality of your runway approach. Your score takes into account your fuel consumption and elapsed landing time; both depend on your ability to decrease airspeed and altitude uniformly, while maintaining a constant glide slope and a correct bearing to the runway. The final approach and landing are the most difficult part and they affect your score the most.

You are strongly urged to read through all these instructions before trying to land your aircraft. You'll need to understand many different aspects of the landing procedure, including the sequence and timing of activities necessary for a satisfactory landing and the relationship between warning signals and appropriate follow-up actions.

### REQUIRED ACCESSORIES

Cassette version  
24K RAM  
ATARI 410 Program Recorder  
Diskette version  
32K RAM  
ATARI 810 Disk Drive  
ATARI BASIC Language Cartridge  
One ATARI Joystick Controller



## GETTING STARTED

1. Insert the ATARI BASIC Language Cartridge in the (Left Cartridge) slot of your computer.
2. Plug your joystick controller into the first (leftmost) controller jack in the front of your computer console.
3. If you have the cassette version of the game:
  - a. Turn on your computer and connect your program recorder to the computer and to a wall outlet.
  - b. Turn on your TV set.
  - c. Slide the 747 LANDING SIMULATOR cassette into the cassette holder in your program recorder and press REWIND until the tape rewinds completely. Then press PLAY.
  - d. Type CLOAD on the computer keyboard and press the RETURN key two times.
  - e. After the cassette loads into computer memory, you'll see the READY prompt. Type RUN and press the RETURN key.

### If you have the diskette version of the game:

- a. Turn on your disk drive.
- b. When the BUSY light on your disk drive goes out, open the drive door and insert the 747 LANDING SIMULATOR diskette with the label in the lower right-hand corner nearest to you.
- c. Turn on your computer and your TV set.
- c. At the READY prompt, type RUN "D:FLIGHT" and press the RETURN key. If you're using more than one disk drive, remember to follow the device initial (D) with the number of the drive containing the 747 LANDING SIMULATOR diskette (e.g., RUN "D2:FLIGHT" for disk drive two). The program will load into computer memory and start.

## THE FIRST DISPLAY SCREEN

The following information displays for about 20 seconds:

```
      747
LANDING SIMULATOR

      1981

William J. Graham
```

## LANDING YOUR AIRCRAFT

### INITIAL GAME DISPLAY SCREEN

The following information displays at the start of each landing attempt. You use this screen to set your options and to monitor your progress from landing to landing.

```
747
SCORE 00000
HIGH  00000
INSTRUMENTS ON
FLIGHT LEVEL 1
FLIGHT NUMBER 1
TIME 0000
```

SCORE refers to your performance on your last landing attempt.

HIGH refers to the highest score you've earned during this game session.

INSTRUMENTS ON is the default mode of landing. You have two choices, and you can change from one to the other by pressing the OPTION key. The easier (and default choice) is INSTRUMENTS ON—you land by reading the warning signals and flight information displays on your instrument panel, which are continuously updated. This mode is known as flying under IFR (instrument flight rules). INSTRUMENTS OFF is the more difficult method—you must land by judging the visual cues of the runway, horizon, and warning lights and the sounds of turbulence. In this mode, known as flying under VFR (visible flight rules), only the initial and final values of the flight parameters display. You use the warning lights to guide you in correcting your bearing. In general, you must rely heavily on your past flight experience under instrument landings to land safely. This option is only for players already very experienced at flying under IFR mode. Owing to the difficulty of this option, your score is doubled when you land safely under VFR.

FLIGHT LEVEL refers to the level of difficulty under which you want to attempt a landing. You may choose 1, 2, or 3 by using the SELECT key. Level 1 is the easiest (and the default). The higher the flight level, the more difficulty you'll have keeping your aircraft on course.

FLIGHT NUMBER refers to the next attempted landing you'll be making in this game session. It updates automatically.

TIME displays arbitrary units that count the time this initial game screen displays until you press the START key to begin your landing. It has no bearing on game play. The aircraft computer beeps when TIME reaches multiples of 1000, to remind you that it's waiting for you to begin your next landing.

After making your selections, press the START key to begin.



## GAME SUMMARY

Following is a summary of your initial flight parameters, the steps you take to land your aircraft, and the standards by which you're awarded a score. All this information is described in greater detail in later sections.

### Initial flight parameters

Your landing begins with your aircraft at an altitude of 5000 feet and at a ground range of 100,000 feet from the midway point of the runway. (Range is measured from the position of your aircraft to the center of the runway.) Your aircraft's initial speed is 900 feet per second, or about 600 miles per hour. The runway is 10,000 feet long and 300 feet wide. You must land your aircraft before reaching the midway point, that is, at a point 5000 feet past the beginning of the runway (at which time the RANGE on your instrument display reads close to 0 feet).

### Fuel

For an optimal landing, your aircraft must use enough fuel during the approach so that it isn't too heavy upon landing, yet has enough fuel remaining that it isn't in danger of crashing. Your aircraft begins its landing with 9999 units of fuel, and the optimal amount of remaining fuel upon landing is 1000 units. Fuel amounts above or below 1000 units cause equal penalties in the scoring.

### Time

Another important consideration in your approach and landing is the total time elapsed from the beginning of your landing. Time measurement is accurate to 1/60-second real time, using the ATARI 800 computer's internal clock. The clock controls the rate of descent and rate of change in ground range of your aircraft. The less the elapsed time at landing, the higher your score. You're rewarded for a speedy landing because of heavy airport traffic and the split-second timing required during landings.

### Landing sequence (see the illustration of SIDE VIEW OF RUNWAY APPROACH)

At the beginning of the flight, you must turn ("vector") your aircraft to the correct bearing of the runway by using your joystick rudder control (see CONTROLS USED TO LAND YOUR AIRCRAFT). You then begin decreasing altitude with your joystick and decreasing airspeed with your throttle control (see CONTROLS USED TO LAND YOUR AIRCRAFT). During the approach, you must occasionally correct your bearing according to signals sent by the airport traffic control localizer transmitter (LT) (see INSTRUMENT DISPLAY).

Your final approach begins when your aircraft is over the beginning of the runway. At that point, your altitude must be between 50 feet and 750 feet, and you should correct any bearing error. When near the ground, you use the slow descent control (see CONTROLS USED TO LAND YOUR AIRCRAFT) to lower your aircraft to less than 10 feet; your landing gear must be down (see CONTROLS USED TO LAND YOUR AIRCRAFT). If your bearing is still correct, you then reverse the engines (see CONTROLS USED TO LAND YOUR AIRCRAFT).

The game is designed so that the best compromise between fuel usage and flight time occurs when your aircraft follows a predetermined glide slope to the runway. This glide slope is about 3 degrees, which is typically used in actual aircraft runway approaches

(see the illustration of SIDE VIEW OF RUNWAY APPROACH). Air traffic control transmits glide slope directions to you through the glide slope transmitter (GST) (see INSTRUMENT DISPLAY).

If you accomplish all these steps successfully before reaching the midway point of the runway and before running out of fuel, then you've made a perfect landing and you receive a score bonus!

## CONTROLS USED TO LAND YOUR AIRCRAFT

You use your joystick and the numbers 0 - 9 on your keyboard as your aircraft controls.

### Joystick functions

The illustration of JOYSTICK CONTROL FUNCTIONS summarizes the descriptions below. The joystick functions are as follows:

#### DIVE--stick forward

50 feet per second--trigger button up. Use this rate of descent to bring the aircraft down to a 3-degree glide slope when you're too high (see the GST indicator explained under "F" in INSTRUMENT DISPLAY) until your aircraft is at an altitude of less than 100 feet and you're over the runway.

3 feet per second--trigger button down. Use this rate of descent to bring your aircraft down slowly to less than 10 feet altitude (when you'll press the zero (0) numeric key to reverse your engines).

#### CLIMB--stick backward

50 feet per second--trigger button up. Use this rate of ascent to bring the aircraft up to a 3-degree glide slope when you're too low, as shown by the GST indicator.

3 feet per second--trigger button down. Use this rate of ascent for small increases in altitude.

#### RIGHT TURN (1-degree increments)--stick right.

Use this function to correct positive bearing deviations (see the explanation under  $\phi$  in INSTRUMENT DISPLAY).

#### LEFT TURN (1-degree increments)--stick left. Use this function to correct negative bearing deviations (see $\phi$ below).

CLIMB 50 FT/SEC, RIGHT TURN 1 DEGREE--stick diagonally lower right; trigger button up.

CLIMB 50 FT/SEC, LEFT TURN 1 DEGREE--stick diagonally lower left; trigger button up.



DIVE 50 FT/SEC, RIGHT TURN 1 DEGREE--stick diagonally upper right; trigger button up.

DIVE 50 FT/SEC, LEFT TURN 1 DEGREE--stick diagonally upper left; trigger button up.

WHEELS DOWN--stick right and press trigger button down simultaneously.

Use this function to lower your landing gear before touchdown.

WHEELS UP--stick left and press trigger button down simultaneously.

AUTOPILOT--stick center; press trigger button (press again to revert to MANUAL mode).

On autopilot, your aircraft automatically follows a 3-degree glide slope from the time you press the trigger button, and it maintains the current bearing. If you're on the correct flight path when you turn on autopilot, your aircraft will continue along this flight path. If you're initially off the correct flight path, the flight path followed by autopilot may eventually result in a midair collision or a missed runway approach. The other joystick controls are inoperative until you return to MANUAL mode. Using autopilot reduces your final score.

ABORT LANDING--stick diagonally upper left and trigger button down simultaneously.

Use this function at any time to avoid an imminent crash. You receive a nominal score if you abort your landing.

## Keyboard functions

The numerical keys 0 - 9 on your keyboard are your throttle to control airspeed. Each number represents airspeed in hundreds of feet per second. For example, pressing the 9 key changes airspeed to 900 feet per second--about 600 miles per hour. Your landing begins at an airspeed of 900 feet per second. You must gradually reduce this speed during your descent. When you land, you press the 0 key to reverse your engines for deceleration.

Let's look at your instrument display next. Then we'll put this information together to describe the procedure for landing safely.

## INSTRUMENT DISPLAY

The illustration of the INSTRUMENT DISPLAY summarizes the following descriptions. The instrument display at the bottom of your screen consists of (from upper left to lower right):

ALT (number displays below)--radar altimeter

The altimeter indicates altitude in feet. You control altitude with the CLIMB and DIVE functions on your joystick.

RANGE (number displays below)--distance measurement equipment (DME) beacon indicator

The DME indicator shows the range in feet from your aircraft to the midway point of the runway. You control range by a combination of joystick movements and numeric keys.

$\phi$  (phi) (number displays below)--bearing deviation indicator

The bearing deviation indicator shows the amount of deviation in degrees of the horizontal line of flight of your aircraft from the correct line of flight to the runway. A negative bearing indicates the runway is to the left; a positive number indicates it's to the right (see also the explanation under " $\nabla$ " LT indicator). You correct bearing deviations with LEFT and RIGHT TURNS via your joystick (see the illustration of BEARING DEVIATIONS).

$\nabla$  (nu) (number displays below)--airspeed indicator





The airspeed indicator shows your aircraft speed in feet per second. You control airspeed with the numeric keys on your keyboard.

T (number displays alongside)--elapsed flight time in seconds  
Elapsed time displays automatically.





F (number displays alongside)--fuel gauge

The gauge indicates your remaining fuel. You start your landing sequence with 9,999 units of fuel; optimum for landing is to have 1,000 units remaining. You control fuel consumption with joystick and keyboard actions that influence your speed and altitude.

$\nabla$  (gamma) (airplane symbol displays alongside)--combination LT (localizer transmitter) indicator and GST (glide slope transmitter) indicator



The LT indicator uses the airplane symbols  and  to indicate flight path bearing corrections. When it displays , use the LEFT TURN movement of your joystick to fly left until the bearing returns to 00. When it displays , use the RIGHT TURN movement of your joystick to fly right until the bearing returns to 00.



The GST indicator uses the airplane symbols  for "fly up" and  for "fly down" to indicate glide slope corrections for maintaining the ideal 3-degree glide slope. When it displays , use the CLIMB function on your joystick to re-establish a 3-degree glide slope. When it displays , use the DIVE function on your joystick to correct the slope.



(symbol displays alongside)--landing gear indicator.

The symbol  indicates your landing gear is up and the symbol  indicates your landing gear is down. To control your landing gear, use the WHEELS UP and WHEELS DOWN functions on your joystick.

The last line in the display is reserved for messages to you for certain events. An illustration of this INSTRUMENT DISPLAY appears at the end of these instructions.

## WARNING LIGHTS TO SIGNAL PROBLEMS

The letters designating your instrument controls normally display in blue and the numeric data display in yellow. When your aircraft is heading for trouble, the letters designating one or more of the instrument controls turn white, to alert you to potential danger. When these warning lights go on, here's what they mean:

- ALT      too far above 3-degree flight path; midair collision imminent (use a DIVE function)
- RANGE    too far below 3-degree flight path; midair collision imminent (use a CLIMB function)
- Φ        bearing deviation (use LEFT or RIGHT turn function) (see the illustration of BEARING DEVIATIONS)
- ∪        airspeed too high (reduce with numeric key)
- T        elapsed time greater than 300 seconds (see Scoring)
- F        remaining fuel less than 1,000 units (see Scoring)
- ∩        immediate altitude correction required to avoid midair collision (check GST indicator and ALT and RANGE warning lights for direction to correct) (see the illustration of GLIDE SLOPE DEVIATIONS)
- Ω        wheels not down when altitude is below 1,000 feet (use joystick to lower wheels)

## SUGGESTED LANDING STRATEGY FOR NOVICE PILOTS

To get you started, here is one suggested landing strategy. Branch out as you become more experienced!

1. Immediately go into AUTOPILOT (joystick center, press button until AUTOPILOT displays in the bottom message line of the instrument data display).
2. Reduce your airspeed by one integer (e.g., 5 for an airspeed of 500) each time the "V" (airspeed) warning light comes on, until you're down to an airspeed of 100, which you must maintain until you're below 10 feet altitude.
3. When your airspeed is near 200, leave AUTOPILOT mode and go into RUNWAY APPROACH (i.e., manual) mode (joystick center, press button until bottom line of display changes). Lower your wheels (joystick right, press button until WHEELS ON symbol displays). Correct your bearing to 00 according to the LT and bearing deviation indicators (joystick left or right). Then return to AUTOPILOT (joystick center, press button until bottom line of display changes).
4. If necessary, return to RUNWAY APPROACH mode temporarily to reduce your altitude so that it will be in the 750-to-50 foot range at the start of the runway.
5. At the FINAL APPROACH (start of runway) press the trigger button to return to MANUAL mode.
  - a. Correct your bearing to 00, if necessary.
  - b. Make sure your airspeed is 100 and your wheels are down.
  - c. Decrease your altitude at 50 feet per second (joystick DOWN, trigger button up) until you're below 100 feet.
  - d. Then decrease your altitude at 3 feet per second (joystick DOWN, trigger button down) until you're below 10 feet--before you reach a RANGE of about 0 feet (midway point of runway).
  - e. Press the 0 key to reverse your engines for deceleration.



## SUGGESTED STRATEGY FOR MORE EXPERIENCED PILOTS

1. When the game begins, the GST indicator,  $\nabla$ , shows the airplane symbol pointing down, for "fly down". Immediately begin a DIVE at 50 feet per second (joystick forward, trigger button up). Keep the joystick forward for now.
2. If the LT indicator (also  $\nabla$ ) indicates you should TURN LEFT or TURN RIGHT to make a bearing correction, keep the joystick forward and, at the same time, push the joystick slightly to the left or right (the upper left or upper right diagonals) until the bearing deviation,  $\phi$ , returns to 00. Immediately return the stick to the forward center position as  $\phi$  changes to 00.
3. Decrease the airspeed,  $V$ , to 800 feet per second (using the numeric 8 key) when the RANGE reads less than 90,000 (that is, 89,999 or less). The optimal point at which to decrease the airspeed to 800 is somewhere between 90,000 and 85,000. Decrease the airspeed again to 700 when the RANGE is 79,999 or less. You should continue to decrease the airspeed,  $V$ , by 100 feet per second every time the RANGE decreases by about 10,000 feet. A rule to remember is that when the first numerical digit of the RANGE changes, you should press that numerical key on the keyboard. For example, when the RANGE changes from 70,000 to 69,999 or less, press the 6 key on your keyboard to decrease the airspeed,  $V$ , to 600 feet per second.
4. After you've begun to decrease airspeed,  $V$ , watch the GST indicator,  $\nabla$ , carefully. When it changes from a downward airplane symbol ("fly fown") to an upward airplane symbol ("fly up"), you're now below the 3-degree flight path. Pull the joystick backward to CLIMB back up to the correct flight path. If you get too far below (or above) the flight path, a midair collision might occur (see the illustration of GLIDE SLOPE DEVIATIONS). If the LT indicator,  $\nabla$ , shows that bearing deviation corrections are also required during this time, keep the joystick backward and push it slightly left or right to the lower left or lower right diagonals, to CLIMB and TURN LEFT, or CLIMB and TURN RIGHT.
5. Continue to follow the LT and GST indicator,  $\nabla$ , to CLIMB, DIVE, TURN LEFT, or TURN RIGHT, as necessary. Also continue to decrease airspeed as explained earlier.
6. When your range is less than 20,000 feet, the  $\Omega$  indicator will light up, telling you to lower your landing gear. After you've done so, make sure your airspeed,  $V$ , is 100 feet per second. When the range is less than 10,000 feet, no more midair collisions can occur. When the range is less than 7500 feet, no more bearing deviations will occur, unless you cause them by pushing your joystick LEFT or RIGHT). If you've maintained the correct glide slope, your aircraft should now be at an altitude of about 375 feet (when the range is 7500 feet). Continue decreasing altitude as shown by the GST indicator until you reach the FINAL APPROACH at a range of about 5000 feet, when your altitude should be about 250 feet.
7. On your final approach and landing, continue your DIVE at 50 feet per second until the altitude is less than 100 feet. Now begin a slow DIVE at 3 feet per second (joystick forward, trigger button down) until altitude is less than 10 feet. When your altitude is less than 10 feet, release the joystick and trigger button, and press the 0 (zero) key, which reduces your airspeed to 0 to stop and reverse your engines. Congratulations! You've made a perfect landing.

8. Experiment with variations of this strategy to achieve the highest score you can in FLIGHT LEVEL 1.

A variation of step 3 that makes it easier to stay on the correct glide slope and avoid midair collisions is immediately to decrease the airspeed,  $V$ , to a lower value, such as 500, 300, or even 100 feet per second. This technique allows a faster return down to the correct glide slope because your forward motion decreases.

If you can achieve a score of more than 10,000, you're ready to go on to FLIGHT LEVEL 2 and eventually FLIGHT LEVEL 3. If you want to see just how difficult the game can be, try the INSTRUMENTS OFF option. Now you must follow the same strategy, but with only the INSTRUMENT DISPLAY warning lights and view of the runway to guide you.

9. Using the AUTOPILOT control (trigger button down, joystick center) will keep the aircraft on its present flight path (even if incorrect) without your help, but at the severe loss of 75 percent of your final score. To use the AUTOPILOT, wait until the bearing,  $\phi$ , is 00. Continue increasing or decreasing altitude as required by the GST indicator,  $\gamma$ . When the airplane symbol changes direction, immediately release the joystick and press the trigger button until the message display panel reads AUTOPILOT. The AUTOPILOT remains on until you revert to MANUAL RUNWAY APPROACH mode by pressing the trigger button again. When the AUTOPILOT is on, you have no control over the joystick functions, even during the FINAL APPROACH (the message display reads FINAL APPROACH even if you're still on AUTOPILOT). To perform flight functions, such as WHEELS DOWN, and the final landing maneuver, which requires a DIVE at 3 feet per second, you must return to MANUAL mode by pressing the trigger button again.

## SCORING

### BASIS FOR SCORE

Your landing score is based on fuel consumption, the total landing time, and bonuses or penalties for various events during the flight.

#### Fuel and time

Fuel consumption takes into account the increase in drag due to both higher air density at lower altitudes, and increased air resistance at higher airspeeds. Fuel usage is less at high altitudes or low airspeeds and is more at low altitudes or high airspeeds. The rate of fuel usage changes with every change in altitude or airspeed.

The equation used to compute fuel consumption is

$$f = (.0002 - .000000002H)V^2$$

where  $f$  is the number of fuel units used in one second,  $H$  is the altitude in feet, and  $V$  is the airspeed in feet per second. This quantity is continuously computed and subtracted from the total remaining fuel units. As mentioned earlier in the instructions, the highest contribution to the score is attained when you have 1,000 units of fuel remaining upon landing.

Landing time is taken into account by giving credit for landings made in less than 300 seconds (5 minutes) and a penalty for landings taking more than 300 seconds. Landing time obviously affects fuel consumption, but it isn't necessarily true that the less the landing time, the higher will be your score, since 1,000 fuel units is the optimum remaining fuel.

Credit for fuel usage and landing time is given only when your aircraft makes it to the final approach, that is, when it's between 750 feet and 50 feet at the end of the runway. If you don't make the final approach, you lose credit for fuel and flight time.



# TABLE OF EVENTS AFFECTING YOUR SCORE

The following events affect your score by adding bonus points or subtracting penalties.

SCORING EVENT TABLE			
EVENT #	DESCRIPTION	EXPLANATION	BONUS (OR PENALTY)
1	ZERO FUEL	Out of fuel	-10 (causes crash)
2	MISSED APPROACH-HI	Altitude greater than 750' at end of runway	-1
3	MISSED APPROACH-LO	Altitude less than 50' at end of runway	-10 (causes crash)
4	MISSED APPROACH- $\phi$	Too far off course	-1
5	FINAL APPROACH	Above runway at good altitude	APPROACH=1 (credit for fuel & time)
6	PERFECT LANDING	Altitude less than 10', wheels down, speed 0, before midway on runway	100
7	INSTRUMENT ERROR	Pressed illegal key	-8 (causes crash)
8	DROPPED TO RUNWAY	Decreased altitude too much over runway, or speed zero while altitude over runway too high (over 10')	-5
9	OVERSHOT RUNWAY	Passed midway point of runway without landing	-7 (causes crash)
10	BELLY LANDING	Landed before lowering landing gear	-7 (causes crash)
11	AIRCRAFT STALL	Zero airspeed before reaching runway	-10 (causes crash)
12	MIDAIR COLLISION	Deviation from flight path caused collision	-10 (causes crash)

## COMPUTATION OF FINAL SCORE

Your final score is computed by the following algorithm in FLIGHT LEVEL 1:

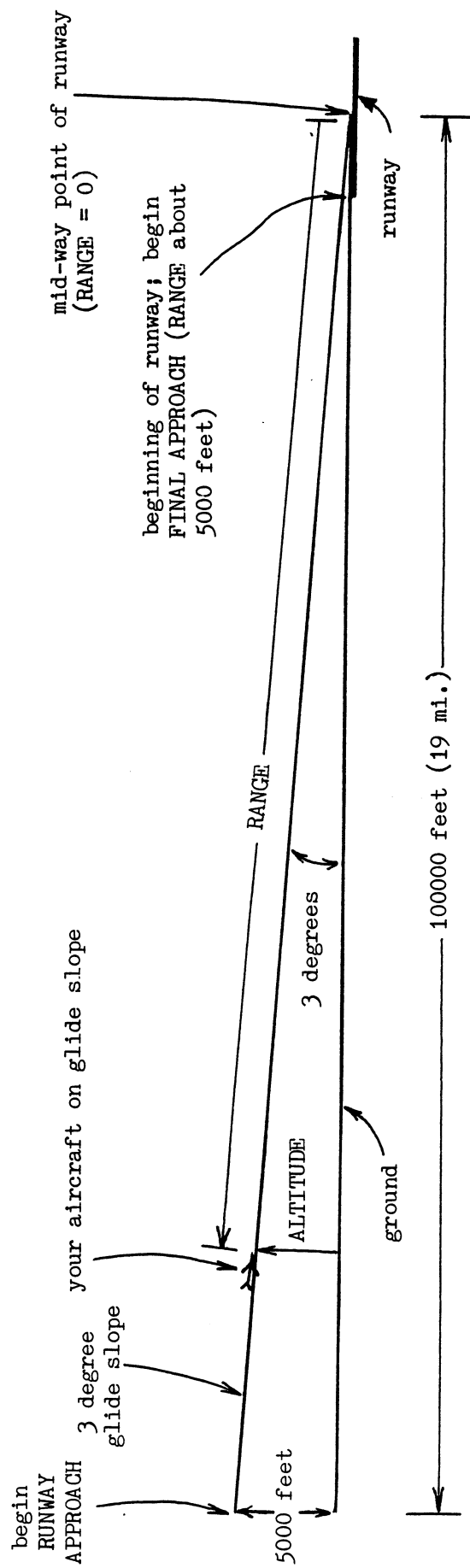
$$\text{SCORE} = 5(2 - \text{OPTION})(F - 2(T - 300))\text{APPROACH} + 10\text{BONUS} + 100$$

If you chose INSTRUMENTS ON, then the value of OPTION in the algorithm is 1; if you chose INSTRUMENTS OFF, then its value is 0. The value of F is the remaining units of fuel, and T is the elapsed flight time. If you reach the final approach, then the value of APPROACH is 1, giving credit for remaining fuel and flight time. The value of BONUS is given according to the above SCORING EVENT table. You earn an additional bonus for a score greater than 10,000 if you selected INSTRUMENTS ON, and for a score greater than 20,000 if you selected INSTRUMENTS OFF. In both cases, the excess points beyond 10,000 or 20,000 are multiplied by 10. Your score is then adjusted for the FLIGHT LEVEL you selected and for whether you used AUTOPILOT by the factor

$$.5(1 + \text{SEL})\text{AScore}$$

where SEL is the FLIGHT LEVEL selected and AScore = .25 if you used AUTOPILOT or AScore = 1 if you didn't use AUTOPILOT.

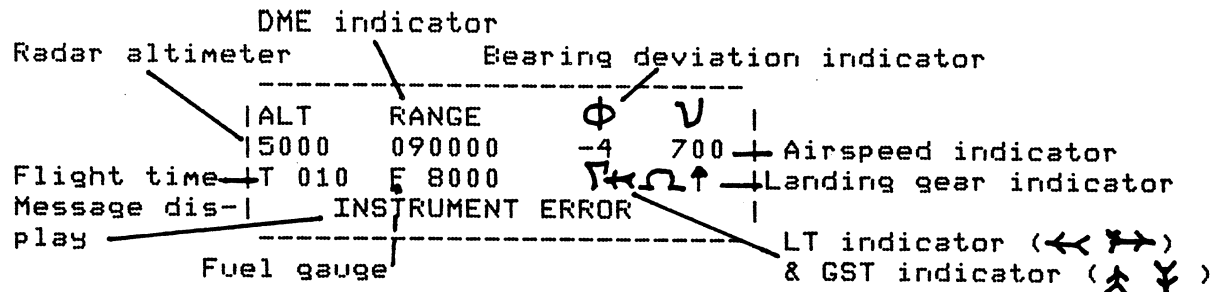




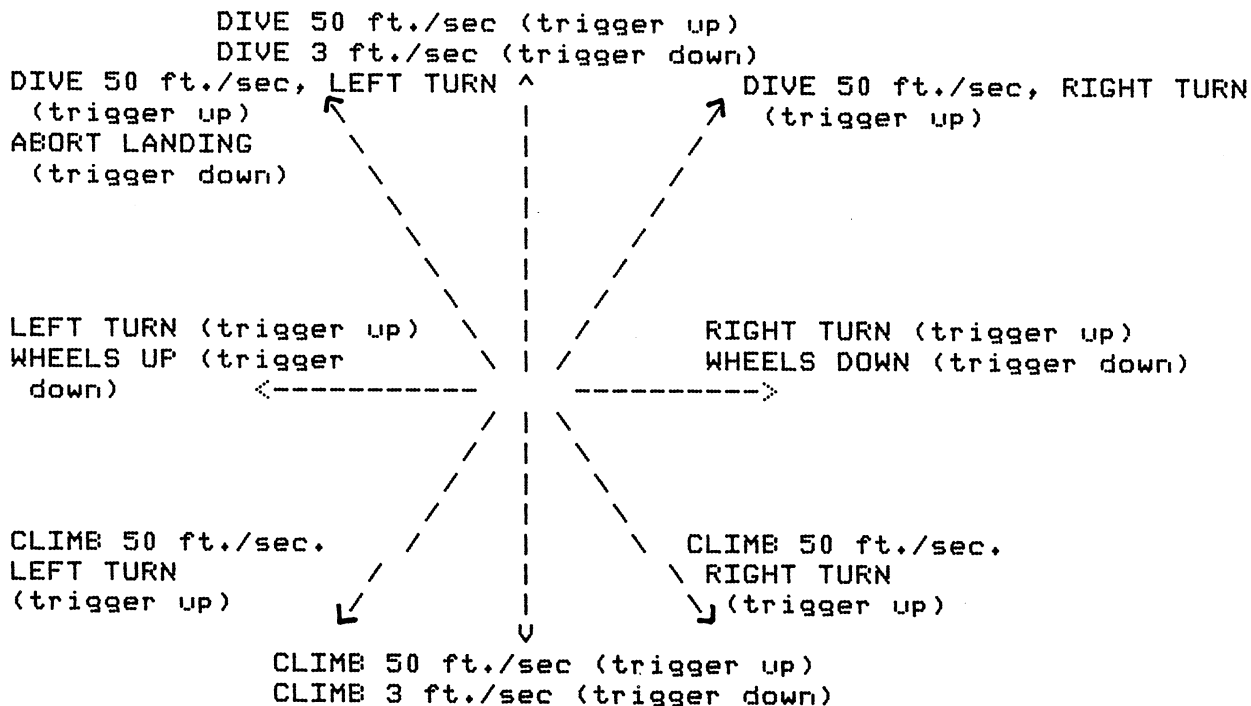
1 SIDE VIEW OF RUNWAY APPROACH



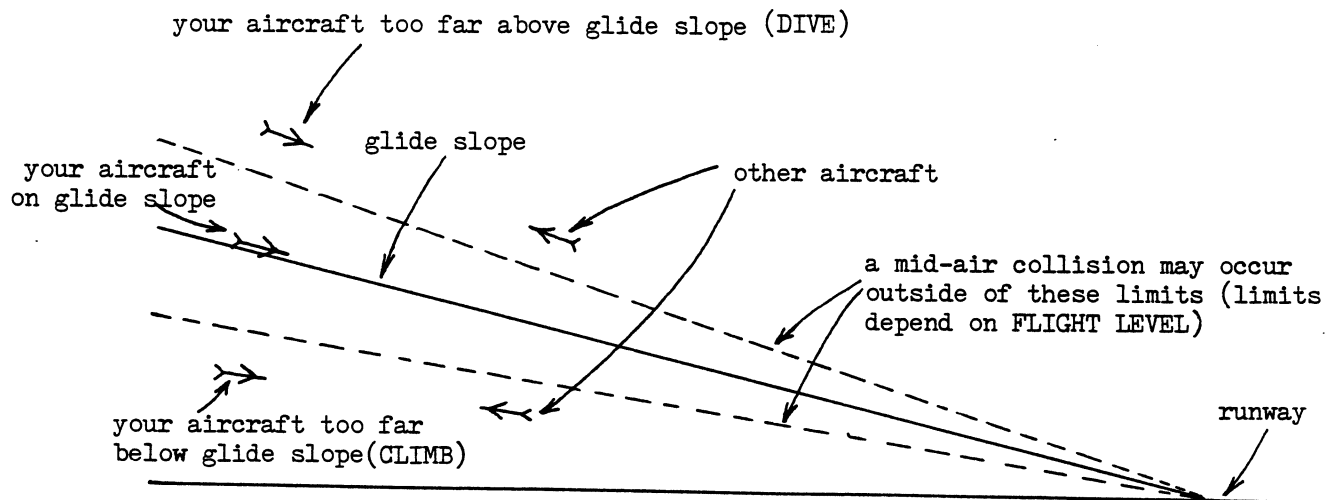
## 2 INSTRUMENT DISPLAY



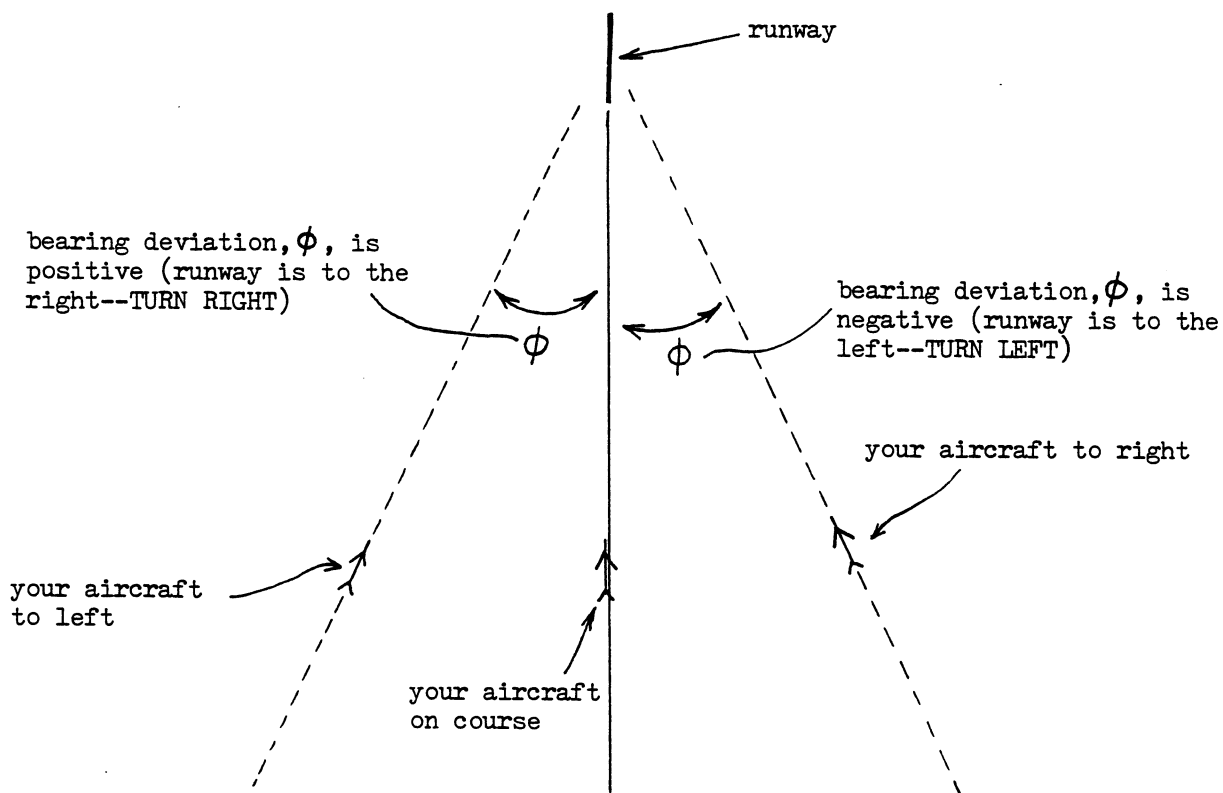
## 3 JOYSTICK CONTROL FUNCTIONS



AUTOPILOT (joystick center, trigger down)



#### 4 GLIDE SLOPE DEVIATIONS



Note: Bearing deviations will not cause a MID-AIR COLLISION but may cause a MISSED APPROACH.

#### 5 BEARING DEVIATIONS



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# ATARI PROGRAM EXCHANGE

## REVIEW FORM

We're interested in your experiences with APX programs and documentation, both favorable and unfavorable. Many software authors are willing and eager to improve their programs if they know what users want. And, of course, we want to know about any bugs that slipped by us, so that the software author can fix them. We also want to know whether our documentation is meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program \_\_\_\_\_

2. If you have problems using the program, please describe them here.

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3. What do you especially like about this program?

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4. What do you think the program's weaknesses are?

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5. How can the catalog description be more accurate and/or comprehensive?

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6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program?

- \_\_\_\_\_ Easy to use
- \_\_\_\_\_ User-oriented (e.g., menus, prompts, clear language)
- \_\_\_\_\_ Enjoyable
- \_\_\_\_\_ Self-instructive
- \_\_\_\_\_ Useful (non-game software)
- \_\_\_\_\_ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

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8. What did you especially like about the user instructions?

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9. What revisions or additions would improve these instructions?

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10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

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11. Other comments about the software or user instructions:

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