CONTROLLER

CONTROLLER IS AVALON HILL'S TRADEMARK NAME FOR ITS AIRPORT TRAFFIC CONTROL GAME

Microcomputer Game of Airport Traffic Control

INSTRUCTIONS FOR: ® Trademark of Apple Corp.
Apple II+ with 3.3 Disk Drive, 48K

INSTRUCTIONS FOR: ® Trademark of Warner Communications
Atari 800 with 810 Disk Drive, 32K

INSTRUCTIONS FOR: ® Trademark of Warner Communications
Atari 4/800 with 410 Cassette Drive, 16K

The air traffic controller's job is not a casual one. The need for immediate and precise decision making arises often and those controllers who hesitate or choke' under the pressure threaten the lives of every person aboard the aircraft they control. AVALON HILL'S Microcomputer Game, CONTROLLER simulates the real-life situations and pressures experienced by airport traffic controllers every working day.

Real-time play and graphics make CONTROLLER a distinctly different type of computer simulation game. In CONTROLLER, the computer will not wait for you to make decisions. As each second ticks away the aircraft under your control (up to 8) are using up precious fuel. You must quickly determine which aircraft are low on fuel, need course correction, are in danger of mid-air crashes and guide them all to a safe landing.

GAME SET UP

The game requires a few minutes to initialize, thereafter you will be asked how many of the eight aircraft in the game you wish to control. Aircraft not under your direct control will be randomly controlled by the computer, tending to cross over the airport.

The eight aircraft will be labeled flights A through H. You will always control flight A, followed by B-H in alphabetical order, depending on the number of aircraft selected. (Example, if you choose to control four planes, they will be flights A, B, C and D. The computer will control flights E through H.)

Next the Aircraft Classification must be determined for each of the Eight flights, there are three types:

TYPE		DESCRIPTION
A	-	propeller driven, light plane, slow, but maneuverable
B	-	jet airliner, fast, hard to maneuver
C	-	private jet aircraft, fast and maneuverable

AIRCRAFT STATISTICS

	AIRCRAFT TYPE A	B	C
MAXIMUM SPEED (KNOTS PER HOUR)	150	550	350
STALL SPEED	70	140	110
RATE OF TURN (DEGREES PER SECOND)	3	2	4
CEILING (FEET)	12K*	45K*	35K*
FUEL USAGE (APPROXIMATE) MAX. SPEED	2.04	11.2	3.56
MIN. SPEED	.95	2.85	1.12
RATE OF CLIMB (FEET PER MINUTE)	3k	9k	12k

*K = 1000
(For your convenience a pad has been furnished to record the aircraft type for each flight.

The final decision you must make before starting play, (Atari only) is whether or not to use the visible "radar sweep" option. Your decision will have no effect upon the play of the game, only the visual effect of the RADAR Scope.
Game begins with all aircraft randomly positioned, heading away from the airfield.

GRAPHIC DISPLAY

COMMAND LOCATION: All commands entered by the player will be displayed at this location on the graphic display. In the following example the command is "change altitude to 1000 feet".

AIRCRAFT: Aircraft are displayed as a white block with the letter of the Flight inside. When two, or more, aircraft occupy the same location on the radar scope (this can only be possible if there is at least 1000 feet of altitude between the aircraft, otherwise a crash will occur) only one aircraft will be displayed.

DEGREE MARKER: Each marker represents five degrees. The four blocks with numeric values represent 0,90,180 and 270 degrees respectively.

CENTER OF SWEEP: The location that all BEARINGS and RANGES are taken from. Example, an aircraft bearing 5 degrees at 3 miles ranges is 5 degrees and 3 miles north of the CENTER SWEEP, not from the runway. The CENTER of the SWEEP is approximately three miles north of the runway.

SWEEP: (Atari disk only) Is an optional feature of the display and has no effect upon play.

RADAR SCOPE: There are two radar scope displays, 10 and 100 mile scale. Only aircraft at ranges of less than 10 miles will be displayed on the 10 mile scope. All aircraft will be displayed on the 100 mile scope, except those planes that have gone beyond the 100 range of your radar. To change scales type 'S' and press RETURN.

RUNWAYS: There are two runways for guiding aircraft to a safe landing, the 130-139 degree and 90-99 degree runways. These runways must be approached via the appropriate approach markers (see graphic display diagram).

THE GRAPHIC DISPLAY The graphic display will contain all the information required to play CONTROLLER.

A1000 COMMAND LOCATION

AIR TRAFFIC CONTROL O, 9O, 18O, 27O

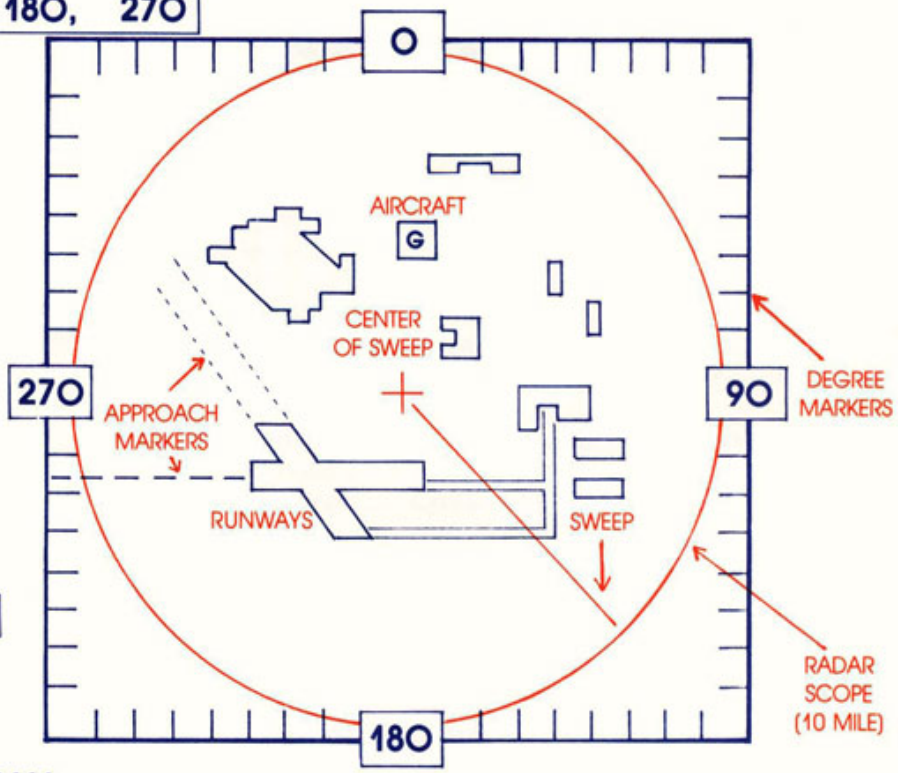
HEADING ALTITUDE VELOCITY

AIRCRAFT MARKER →

	HGD	ALT	VEL
A	219	5285	70
B	218	4601	150
C	CRASHED		
D	5	2267	115
E	SAFE LANDING		
F	45	4211	130
G	301	938	141
H	CRASHED		

A-ALT, C-COURSE, V-VEL, L-LAND, S-SCALE

FUEL = 91.6, TURNING TO 208 ← AIRCRAFT STATISTICS
HEADING TO ALT 800
BEARING 4 RANGE 6.42482666



(Atari Radar Display Enlarged)

APPROACH MARKERS: '---' 90-99 degree and('•. •.' Atari) ('+++' Apple) 130-139 degree markers. To safely land aircraft, it must be lined up on one of the above approach markers, and heading towards the runway. (see graphic display diagram).

AIRCRAFT MARKER: Indicates aircraft currently under control.

AIRCRAFT STATISTICS: Displayed below the main display are the statistics for the aircraft currently under control. These statistics are:
FUEL-the amount of fuel (in pounds) remaining for that aircraft.
TURNING TO . . . - the last course command entered for that aircraft.
HEADING TO ALT . . . - the last altitude command entered for that aircraft.
(Note, TURNING TO and HEADING TO ALT should not be confused with the statistical display just to the left of the radar scope.
That display indicates the *current* Heading (HGD), Altitude (ALT), and Velocity (VEL) for all aircraft.
BEARING-the compass position of that aircraft in relationship to the CENTER OF SWEEP.
RANGE-the distance of aircraft from the CENTER OF SWEEP measured in miles.

EXAMPLE OF USING THE DISPLAY

Looking at the GRAPHIC DISPLAY you will observe that the RADAR SCOPE is in the '10 mile' mode and that the only aircraft displayed is Flight 'G'. On the left hand display you note that aircraft 'G' is heading west by northwest (left and towards the top of the display) at 301 degrees, its altitude is 938 feet and rate of speed is 141 knots. Also note that the AIRCRAFT MARKER is pointing to Flight 'G' and that additional statistics are displayed below the main display. Aircraft 'G' has 91.6 pounds of fuel remaining, it is descending to an altitude of 800 feet and is in the process of turning to a new heading of 208 degrees. At the present time it is bearing 4 degrees at a distance of 6.4248266 miles from the CENTER of SWEEP.

COMMANDS

COMMAND

A thru H — Typing 'A' through 'H' followed by pressing the RETURN key will transfer control to the corresponding flight. Example; 'F' (RETURN) sends control to flight 'F'.

A NUMERIC VALUE — commands the aircraft to go to the altitude indicated by the numeric value entered. Example: A2500(RETURN) directs the aircraft to go to an altitude of 2500 feet.

L — will land the aircraft if all the landing requirements have been met. (See Landing Aircraft) If they have not been met the computer will ignore the command.

C NUMERIC VALUE (0-359): directs the aircraft to turn to the heading indicated. The number 0 translates into a direction of north (top of screen), 90 is due east (right of screen), 180 would head the flight south (bottom of screen). Example: C46 (RETURN) directs the aircraft to turn to heading 046 degrees (see landing approach diagram).

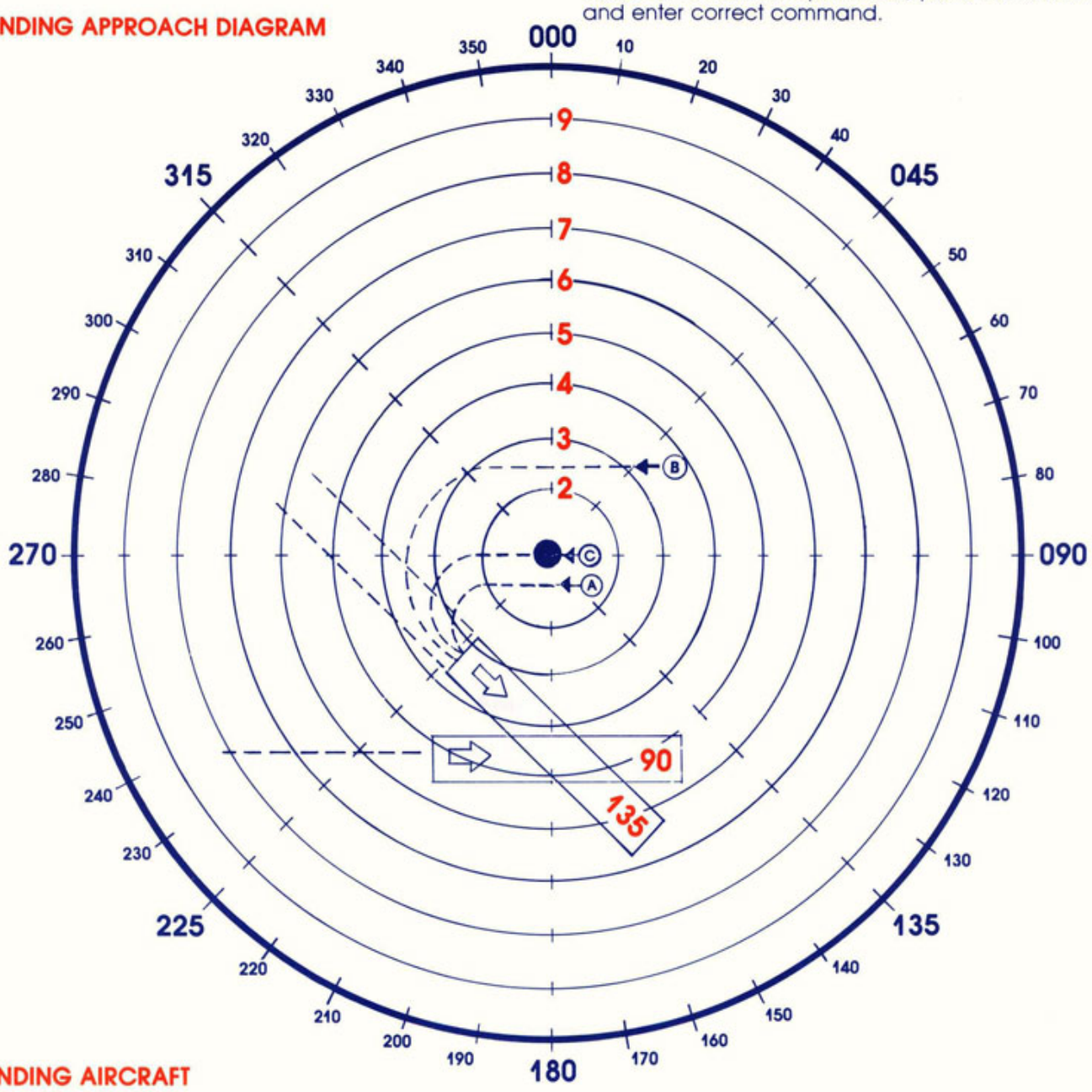
S changes the scale of the RADAR SCOPE. There are two possible radar modes, 10 mile and 100 mile. Example: 'S' (RETURN)

V NUMERIC VALUE changes the velocity of the aircraft. No aircraft can travel faster than its maximum speed for its aircraft type. Example: V70 (RETURN) sets the aircraft's speed to 70 knots.

Note: This is a real-time simulation and all aircraft will react to commands as real aircraft. Aircraft will not immediately go to the heading, altitude or velocity directed, but will only begin to carry out the command entered. Depending upon aircraft type and situation it may require several minutes of real time to finally complete the command. **Double check your keyboard entries to be sure they appear on the screen before entering your next command.**

The DELETE/BACKSPACE key will not function in CONTROLLER. To correct input errors, press the RETURN key and enter correct command.

LANDING APPROACH DIAGRAM



LANDING AIRCRAFT

There are several conditions that must be met in order to land aircraft.

1. The radar scope display must be in the 10 mile mode.
2. Velocity must be within 10 knots per hour of stall speed.
3. Altitude must be under 1000 feet.
4. The aircraft must be on a proper approach, heading towards the runway on one of the two APPROACH MARKERS. (See Landing Approach Diagram above).

If all of the above conditions have been met, type 'L' and press the RETURN key. The aircraft will land safely and taxi towards the hangar buildings. If any of the landing conditions were not met the computer will ignore the 'L' command.

COLLISIONS/CRASHES AND LOST CONTACT

Midair collisions occur whenever flights are within 1000 feet in altitude and one mile in distance from each other.

Aircraft will crash if they run out of fuel. Fuel usage is directly related to the flight's velocity and aircraft type.

If a plane moves beyond the 100 mile range it will not be displayed on the radar scope. You will lose contact with a flight if it goes beyond the 150 mile range.

Crashed aircraft will remain displayed on the radar scope at the location in which it went down. To remove it from the radar display, change the scope scale.

DEFINITION AND EXPLANATION OF TERMS

ALTITUDE	The vertical elevation of an aircraft above sea level.
CEILING	The maximum altitude an aircraft may obtain, based on characteristics of that aircraft.
FUEL USE	The fuel usage of an aircraft is proportional to its velocity. The faster a plane travels the more fuel it consumes. Fuel capacity and usage is different for each type of aircraft.
HEADING	The compass direction in which the longitudinal axis of the aircraft points.
STALL SPEED	The minimum velocity an aircraft can travel without losing lift and altitude.
VELOCITY	The rate of linear movement of an aircraft in a given time frame. In CONTROLLER all velocities are in knots per hour.

LOADING INSTRUCTIONS

ATARI DISK 32K

APPLE DISK 48K

CONTROLLER will load and run automatically. Put the game diskette into the disk drive and "boot" the disk. The program will load and then run. The game will require a few minutes to initialize.

ATARI CASSETTE 16K

1. Turn on your computer.
2. Put the tape in the cassette player.
3. TYPE RUN"C:" and press the RETURN key. The computer will beep.
4. Press the play button on the cassette recorder, and a key on the computer keyboard (do not press Break or Reset).
5. The first part of the program will load and run. The AH Logo will be displayed followed by another BEEP and a prompt to press the space bar.
6. Press the space bar, the main program will load and run automatically.

If the programs cannot be loaded, send the software, with a complete description of the problem (what type of computer you have, what the computer says, if anything, when you try to load the software or play the game, and what you did to try to get it to load.) to:

Avalon Hill Microcomputer Games
4517 Harford Road
Baltimore, Maryland 21214

Defective software will be replaced.

QUESTIONS ON PLAY

Questions on play can be answered by the factory *only* upon receipt of a self-addressed envelope bearing first-class postage.

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Special Thanks to Mr. Frank Embert, F.A.A.

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CONTROLLER

FLIGHT	FUEL	TYPE OF AIRCRAFT
A-H		
A		
B		
C		
D		
E		
F		
G		
H		