OVERVIEW

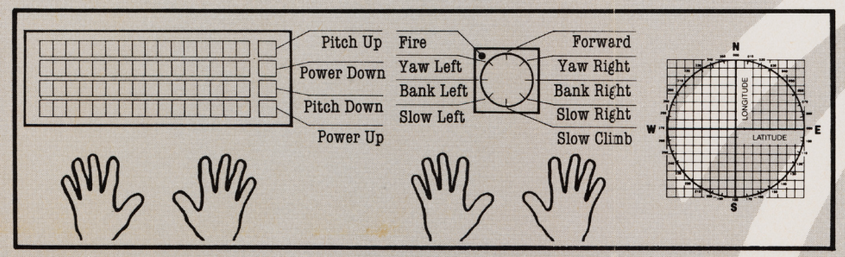
The UH2X is the successor to the now legendary UH1X with many new features incorporated into the already ultra hi-tech system. Over fifty displays, gauges and indicators fill the console and numerous one-touch keyboard controls as well as sophisticated on-board computer functions leave little for the "seat-of-your-pants" to do.

Of course, the maverick pilot can bypass all this and take off on pure nerve. It is entirely up to you.

The control system of the UH2X has been modified to satisfy novices and professionals alike. Although the control of the UH1X took avionics to a new level, it did prove a bit complicated for mere human beings. At Cosmi Aircraft, we strive to make your flying experience both a thrill and a pleasure. This philosophy has given birth to a new control system that not only provides complete manoeuverability but is also incredibly easy to use.

The system is designed to be ideal for a pilot/co-pilot situation as illustrated below. This way the pilot can control the flying exclusively while the co-pilot can act as computer operator, weapons officer, navigator and communications officer.

Whether solo or with a co-pilot, you will be soaring through the air in no time.



CONTROLS

Start the engine and turn on electrical systems with the run/stop key (F2). Accelerate the engine with the F7 key to between 500 and 600 RPM. If necessary, decelerate with the F5 key. The rotor will automatically engage and the rotor RPM will slowly rise to match the engine speed (at a 1 to 10 ratio).

Accelerate (F7) to around 2000 RPM and let the rotor catch up, then accelerate to 3000-3500 RPM and wait for the rotor. These steps are taken to avoid too great a difference between engine and rotor RPM that could increase rotor wear.

To take off, raise the pitch (F1) and monitor the level on the LCD (38). At a point above equilibrium, which is determined by the rotor RPM, the helicopter will lift at a rate based on the level of pitch; the higher the pitch level, the faster it will lift. Monitor the altitude at the altimeter (45). Now lower pitch (F3) and the rate of lift will slow until it stops at a hover. This is the point of equilibrium. If the pitch level falls below this point, the craft will begin to descend at a rate that increases as pitch level is lowered. The actual rate of lift or descent is displayed on the VSI Readout (36), in positive (lift) or negative (descent) values. To move the helicopter horizontally, push the joystick forward a slight amount. The speedometer (44) will start to increment, the altitude indicater (37) will rise above the horizon line and, if the altitude was steady, it will begin to fall. This is because as the joystick (which is the cyclic control) is moved forward, it tilts the rotor in the same direction. This transfers some of the lifting power to forward acceleration. Therefore, it affects the system in the same way as if the pitch was lowered proportionately.

To return to level flight at the established speed, increase pitch (F1). The more speed required, the greater the pitch level will need to be. However, at any pitch level, the cyclic control will transfer that power to forward motion. So that at full forward stick, the craft will always descend. To achieve the fastest level flight, raise pitch (F1) to full (38) and push the stick forward until the helicopter starts rising and pull back a bit if it starts to fall. The forward Speed will also depend on the engine RPM. Therefore, an increase in acceleration (F7) will increase both speed and lift and the pitch and cyclic controls will need to be adjusted.

To turn the helicopter, there are two general methods. The most direct and quickest is to push the joystick (cyclic) in the direction of turn. A half left turn (joystick to the diagonal forward/left) will accomplish a slower turn to the left while keeping the helicopter level. A full left will bank the craft and result in a faster left turn.

The second method is to change the pitch of the tail rotor using the anti-torque controls (39A). The LCD (39) shows a line across the center when the torque caused by the main rotor is compensated for by the pitch of the tail rotor. Normally, this control is internally automatic, keeping steady with any rotor RPM changes. When the pitch is manually altered, the LCD (39) will indicate the change in under-or-over-compensation which will result in turning the craft left or right at a rate determined by the degree of change. Any manual change will need to be manually corrected to stop the turning by taking the opposite action.

Given this control system, the suggested method of operation is to bring the helicopter to the desired altitude (45) and speed (44) and then fly the craft with the stick almost exclusively. Changes in altitude can be accomplished by moving the stick forward or back and turns done with the other directions. Alternatively, a method more like actual helicopter controls would be to affix the joystick to the work surface and operate it with the left hand while the right hand operates the pitch and engine controls (function keys) on the computer.

The console displays dedicated to aircraft control are the engine (31) and rotor (30) RPM gauges, the altimeter (45), the speedometer (44), the compass (34), the altitude indicator (37), the pitch (38), tail-rotor (39), manifold pressure (40), LCD indicators and the VSI (36). The RPM and AVI (altitude/velocity indicator) systems have both slide gauge and digital readouts. All have warning lights on each side to indicate excessively low or high levels. The digital compass shows in degrees (000-360), the actual geographic heading of the helicopter with 000 being true north.

The altitude indicator, or artificial horizon, displays the deviation of the craft from the horizontal, or level flight. For example, when moving forward, the nose dips down and the A.I. rises. When slowing, the nose comes up and the A.I. moves down. If the dark lines go below the green half of the display, the helicopter is "flaring" and slowing very quickly to a halt. The helicopter should be level when landing. The four lights to the right of the A.I. are a graphic representation of horizontal displacement. These are useful when the display screen is completely covered or clear. The pitch and anti-torque LCD's show the level of change produced by the keyboard controls.

The manifold pressure LCD displays the power demands put on the engine. If the engine or rotor system is damaged, for example, it could put excessive strain on the engine driving up manifold pressure.

WARNING: At very high levels, the engine will automatically shut down to prevent rupture. The vertical speed indicator shows digitally the rate of lift (+) or descent (–). A safe landing should be made at the smallest possible negative rate.

Differences between a real cyclic control and joysticks should be noted. To reach a level of change with a cyclic, one would push it in a direction and hold it at the desired angle. Since the joystick is merely an on and off switch, to hold it "on" is to continue to change. Therefore, when using the joystick as a cyclic, hold it in the desired direction until the desired change has been achieved and then release it.

CAPABILITIES

The UH2X is equipped with two 9MM machine guns that hold 1000 rounds each. The guns are activated by the up-arrow key (8A) and fired by the joystick fire button. The ammunition supply is counted down while firing on the digital display (8). Two lights on the left indicate problems: either a low ammo supply (2) or a firing malfunction (5). The guns can be reloaded only at a base by using the loading commands on the computer. Turning on the 9MM deactivates the ATA Missiles.

The Air-To-Air Missiles are activated by the back arrow key (9A) and fired with the fire button. The UH2X carries a maximum of 20 missiles and can be reloaded only at Base. The missiles are short range and detonate automatically at five miles, or on impact. Three lights indicate low supply (3), launch malfunction (4), or arming malfunction (6). Turning on the ATA deactivates the 9MM guns.

The UH2X also carries a CO2 Tank for fire control capability. The tank release is set by the slash key (7A) and the CO2 is released with the space bar. A digital counter (7) displays the PSI Level and the light indicates low levels. The tank can be refilled only at a Base.

A hoist can be lowered and raised with the cursor keys (55). The computer screen displays a graphic image to help pinpoint the hoist line. An air radar screen (10) automatically activates when an airborne object comes into range. The center of the screen represents the location of the UH2X and the bottom half is in back of it.

Below the computer screen is an AM/PM digital clock (35). That determines the time of day and runs in real time. The clock can be set (35A) at the start of a mission only and runs from that point on.

NAVIGATION

The area available for flight is 200 miles square. The main base is at the exact center (Plot 00,00), and there are four secondary bases at the center of each quadrant (Plot 50,50). Each Base is equipped for refueling, reloading and repair.

An odometer (46) displays miles travelled and current direction. This same readout displays return mileage and direction when the Equals Key (46A) is pressed if the navigation system is tuned to a transmitting signal.

The navigation system can be tuned to three types of incoming signals with the tuning buttons (41A). On initial start-up, the days' VOR Frequency is established and is transmitted from the main Base only. Tuning through a range 000-999, a reception indicator will light at the proper frequency. The homing frequency is set each time a HOM command is used. The rescue frequency is established by the sender. All three signals can be transmitted simultaneously but only one can be tuned to.

The ground radar (11) is activated when the navigation system is tuned to an incoming signal. Each type of signal source is displayed on the grid if the appropriate key is pressed; Base (32A), HOM (42A) and Rescue (43A). The compass heading to the source is displayed at three digital readouts: Base (32), HOM (42) and Rescue (43).

The ground radar grid (11) has two modes. When the UH2X is within five miles of a signal source, the grid is green and each square represents one mile. Outside of a five mile area, the grid turns red and each square represents 10 miles. When at the source of transmission, the grid will be green and the blip will cycle about the center. The center of the grid represents the position of the UH2X. The top half is north, the lower half, south. Right is east and left is west.

A wind speed and direction display (47) allows for course correction due to deviations caused by the wind. For example, if the wind speed is 10 miles an hour from the west and the UH2X is flying due north then the actual course is shifted to the Northwest by 10 miles an hour. This deviation will not show on the compass but will eventually show up on the navigation system.

Navigation in use might proceed as follows:

The UH2X takes off and flies due north, compass heading 000. The VOR navigation signal is initially set to the main Base which is the take-off point. Tune to the proper frequency (41A). The reception indicator will light up and the radar grid, which is green, will start to cycle. The odometer (46) will soon show one mile. The blip will stop cycling. Continue flying north. When the odometer reaches 2 miles, the blip will move down one square; at 3 miles, it will drop another square.

At this point, turn West, heading 270. After another mile, the blip will move one square to the right. The blip will always move in the opposite direction from the UH2X since it represents the source of transmission that the UH2X is moving away from or toward. At six miles out, the grid will turn red and the blip will move back near the center because now each grid square in 10 miles wide.

The base return heading is digitally displayed (32) and should read between 130 and 140. Press the Equals Key (46A) and the odometer display will change momentarily to a readout of the miles and direction to return to the source.

If the helicopter now turns to the heading shown in the VOR Display (32) and continues to follow this or changing headings, the grid should turn green again soon as the UH2X gets within 5 miles of the source. When reaching the source, the blip will start cycling again.

The Radar will operate like this for any signal source as the blip and various sources can be switched between by tuning them in and then pressing the proper key.

There is also an automatic course correction function. A compass heading can be dialed in (33A) and displayed (33). Then by pressing the Right shift key (33B), the UH2X will turn itself to this heading. This is one way to reach a very exact value, where steering might be less efficient. Once a heading is set, each time the shift key is pressed, the craft will come to this heading.

COMPUTER FUNCTIONS

The computer (49) displays various operations and messages and accepts commands from the keyboard.

Commands must be entered in alphanumerics only and activated by the return key (49A). The Pound Key (49B) clears the screen without acting on the input.

STATUS COMMANDS

PLOT — Displays current position in mileage coordinates such as 10 miles north/25 miles east.

GRAD — Reports which navigation signal is currently tracked on the ground radar.

FUEL — Reports exact fuel supply.

BASE — Reports on the condition of all area bases.

FIRE — Reports location of fire hazards.

STAT — Reports the number of possible enemy ships, planes or other craft.

ERTM — Estimates time to helicopter failure based on damage to the craft.

CLIM — Climate conditions.

FUNCTION COMMANDS

HOM — Set a homing device. This establishes a new frequency and cancels transmission of any previous homing signals.

GRID — Displays a landing grid when coordinating signals are available such as landing on a carrier at sea.

TARGET — Displays a targeting grid for weapons. The grid flashes when a target is on line.

THERM — Displays a thermal radar image to center in on hot spots at fire locations for CO2 release.

REPAIR — Activates repairs of malfunctions at base. First reports time required for repair of the particular problem.

CANCEL — Abort repair if time reported is too long for current situation

LATA — Reload missiles. Only at Base.

L9MM — Reload machine guns. Only at Base.

LCO2 — Refill CO2 Tank. Only at Base.

AUTOMATIC DISPLAYS:

Cycle system status checks.
Malfunction reports.
Air Radar Detection.
Incoming Missile Display.
Hoist Display.
Incoming Rescue Signal Message.

MALFUNCTION CHARACTERISTICS

1. ATA Missile Launch or arming problems will deactivate firing.
2. 9MM Machine Guns will not fire when light is on.
3. Oil Line breaks will increase temperature until engine shut-down.
4. Transmission problems will affect rotor operation.
5. Rotor wear can occur with excessive power or large differences in engine and rotor RPM as well as combat damage. Will increase manifold pressure.
6. Compression problems will reduce engine power, lift and speed.
7. Tail rotor wear or damage will result in control problems.
8. Coolant leaks will raise temperature.
9. Torque stabilizer damage will cause control problems.
10. Pitch controls and linkage damage will seriously disable flight controls.
11. Engine turbine problems will affect power and could cause failure.
12. Manifold ruptures will seriously affect power and performance and could cause the engine to explode.
13. Electrical problems can disable various console displays, navigation and the computer.

Malfunctions can occur in many ways and cause various problems from disabled displays to complete destruction. If in combat, for example, being hit may not destroy the UH2X but will cause some damage. This can accumulate to a point of destruction or inability to control the aircraft.

MISSIONS

1. **RENEGADE**
   A UH1X Helicopter has been stolen by a madman who threatens to destroy all the bases in the area. Only the UH2X has a chance to stop him. As a challenge, he has sent a message saying he will follow a square course from base to base and will save the main base for last. However, he has not said which direction he will be travelling in. Try to intercept him. Unfortunately, that gets easier as more bases are destroyed. Keep in mind that the UH1X is armed with machine guns and missiles also. The bases are numbered 1 to 4, starting with the Northeast Quadrant. The main base is Base Zero. Use the "Base" computer Command to check on their conditions. If two bases get wiped out, you will know which way he is heading. Consider this: He may have radioed in his intentions because he knew that you would come after him.
2. **BRUSH FIRE**
   The rolling hills of California are burning again. With UH2X's new fire fighting abilities you can help. Get location reports on the computer and get there fast! Remember, fires spread. The longer it takes, the more damage is done. Fighting the fire with UH2X is like a bombing run. Fly over the fire using the thermal image and release the CO2 when the hot spot is center screen. Hovering over the fire to release CO2 may put the fire out more quickly but the helicopter's external temperature (48) will rise quickly too. It's up to you which method to use. You must return to base to refill the tank. Also, there may be calls for the rescue of other fire fighters. do the best you can.
3. **GULF OF TERROR**
   You are on carrier duty in the Mediterranean. Your job is reconnaissance of shipping in the area and to report on possible terrorist activities. There are gunboats and submarines patrolling all along the shore and hostilities could flare at any time. It is inadvisable to fire on unprovocative vessels but you are free to defend yourself if necessary. Good luck! We're all counting on you!
4. **OIL FIRE**
   While in the Mediterranean area, an American Oil Drilling Operation has come under attack by hostile intruders. The rigging has been set ablaze and American working crews are in jeopardy. The UH2X, with its fire fighting, defense and rescue abilities has the best chance of dealing with the situation. Coordinates will be transmitted. Good luck! We're all counting on you!
5. **BERMUDA TRIANGLE**
   The hurricane season has come to the Florida region. The UH2X is assigned to weather reconnaissance in the infamous Bermuda Triangle and no other information on your mission is available because no one really knows what will happen in "the Devil's Triangle".
6. **ARCTIC RESCUE**
   At a Scientific Station near the Pole, the UH2X encounters some of the most severe conditions for flying possible. Researchers may get lost in a blizzard, or fall into constantly moving crevices in the ice, or other helicopters may go down in gale force winds. Flying near the Pole will affect the compass operations. Of course, nothing at all can happen, too, but don't count on it.

In all scenarios, the main base and four secondary bases are located at the same coordinates, although in the Gulf of Terror, they are carriers instead of bases, and in the Bermuda Triangle, they are located on islands. Various messages and displays will aid you in your assignments but the pilot is under no obligation to perform his or her duties in any prescribed manner.

Super HUEY II

THE HELICOPTER FLIGHT SIMULATOR

designed by Paul Norman for the Commodore 64

Super HUEY II

HELICOPTER FLIGHT SIMULATOR

TAKE-OFF PROCEDURES

1. Start the engine (run/stop) and raise the power (F7) to 500 RPM.
2. Wait for rotor to engage and wind up to 50 RPM.
3. Raise power (F7) to 3000-3500 RPM, pausing for the rotor RPM to catch up.
4. Increase pitch (F1) until lift-off and climb to 200 feet altitude.
5. Push cyclic (joystick) forward to gain speed, and raise pitch (F1) to maintain altitude.
6. At desired speed and altitude, set pitch to approximately 75 per cent and move cyclic forward or backward as necessary to maintain altitude.
7. Cruise, lift, descend and turn with cyclic only unless minor pitch or power adjustments are necessary.
8. More speed is achieved with power (F7) increases. Adjust pitch and cyclic as necessary.

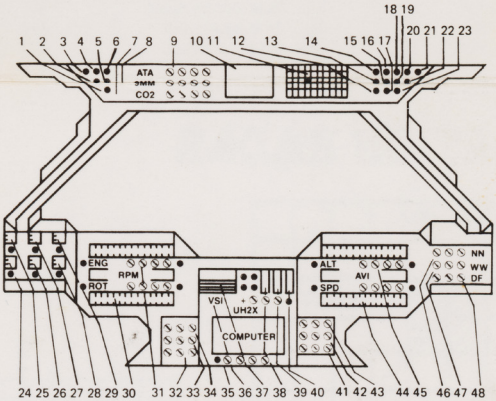
LANDING

1. Push cyclic forward to descend at VSI rate of approximately –15 fps.
2. At 200 feet, pull back cyclic to level off.
3. Lower pitch (F3) and move cyclic as necessary to descend.
4. Adjust pitch up (F1) and down (F3) to maintain a VSI rate less than –5 fps.
5. Slow to stop by pulling back on cyclic until nose rises and push forward to level helicopter (attitude indicator).
6. Descend to ground at minimum VSI rate with pitch controls.

LOADING INSTRUCTIONS

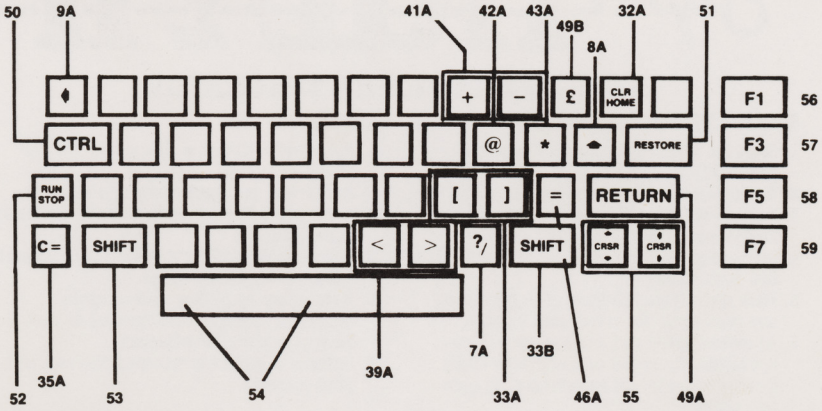
Disk: Type LOAD "*",8,1.

Cassette: Press SHIFT and RUN/STOP keys together. Press PLAY on the cassette recorder.



1. CO2 low level light
2. 9MM low ammo light
3. ATA low supply light
4. ATA launch error
5. 9MM firing error
6. ATA arming error
7. CO2 psi readout
8. 9MM ammo readout
9. ATA supply readout
10. Air radar screen
11. Ground radar screen
12. Oil line malfunction
13. Trans. malfunction
14. Rotor wear
15. Tail rotor wear
16. Coolant warning
17. Rotor torque
18. Pitch control error
19. Linkage malfunction
20. Turbine malfunction
21. Manifold pressure
22. Electrical systems
23. Compression warning
24. Generator
25. Temperature
26. Carburettor
27. Oil pressure
28. Exhaust temperature
29. Fuel
30. Rotor RPM
31. Engine RPM
32. Base nav heading
33. Auto course heading
34. Compass heading
35. Clock and AM/PM light
36. Vertical speed indicator
37. Attitude indicator
38. Pitch level
39. Tail rotor turn
40. Manifold pressure
41. Nav radio frequency
42. HOM heading
43. Rescue heading
44. Speedometer
45. Altimeter
46. Odometer/Direction
47. Wind speed & direct.
48. External temperature

KEYBOARD



50. Program pause
51. Cancel program
52. Engine run/stop
53. Load new program
54. CO2 release
55. Hoist controls
56. Pitch level UP
57. Pitch level DOWN
58. Engine decelerate
59. Engine accelerate
7A. CO2 on/off switch
8A. 9MM guns on/off
9A. ATA missiles on/off
32A. Base nav on radar
33A. Auto course set
33B. Auto course act
35A. Clock set
39A. Tail rotor control
41A. Nav radio tuner
42A. HOM on radar
43A. Rescue on radar
46A. Distance on radar
49A. Computer enter key
49B. Clear computer key

NAVIGATION RADAR