

NIGHTFLITE

To load the program, start tape at beginning, enter LOAD " " on your Spectrum then wait, the program loads in two parts - on completion the computer will display a menu of options - switch off tape.

SCENARIO

You are the pilot of a light aircraft on a flight from an airfield at night, with a runway running East-West (Heading 270°). Select mode 6 - map. The runway is shown along with the VOR (v), the NDB (n), and a range of hills which extend the entire width of the screen up to an altitude of 1650 feet, with one small valley to the West of the runway. The lower half of the screen shows a profile view of the area (when you complete a run your route will be shown in plan and profile). The airspace above this area is very congested, if you should climb above 2200ft there is a high risk of collision.

Your initial position depends upon the Mode selected, if nothing is selected within 30 secs the program will run Mode 0 - Demo. After selection of Modes 1 - 4 you will be prompted to input the wind strength. Input wind strength desired followed by enter. Wind direction is random.

MODE 0 - DEMO

This shows the last 2½ miles of a successful approach (in this case flown on auto pilot) The graphics are a view of the runway, some scattered lights and a village at night, this comes into view at 2 miles. If you can see all of the lights on both sides of the runway then you are in line with the runway. If you cannot see both sides or can see nothing at all then you are not in line. After landing the menu will return.

MODE 1 - FINAL

You are 9 miles from touchdown at 2000 ft, somewhere near the centre line heading West (270°). You must use the instruments available to find the runway and land successfully.

INSTRUMENTS

A/H (Artificial Horizon) - This shows the nose up/down pitch and angle of bank, the horizon is represented by the white line behind the aircraft shape i.e. if the horizon line is below the aircraft then the nose is pitched up, if the horizon slopes from high on the left to low on the right the aircraft's left wing is below the horizon and in a left turn (and vice versa).

ILS (Instrument landing system) - This instrument interprets two radio beams sent out from the runway, one in line with the centreline (heading 270°), the second shows a safe glide slope. The bars on the instruments represent the position of the radio beams relative to the aircraft i.e. if the vertical bar is right of centre then you must fly 'right' to get to it, if the horizontal bar is above the centre, then you are below the glide slope and so on. IMPORTANT - If you are heading away from the airfield the indications appear reversed.

ASI (Air Speed Indicator) in MPH.

ALT (Altitude) in feet above the runway.

HDG (Heading) In compass degrees e.g. 360 = North, 090 = East, 245 = South West.

VSI (Vertical Speed Indicator) This shows rate of climb or descent in feet per minute (minus figures are descent).

FUEL, reduces faster with higher RPM. Initial amount varies with Mode.

FLAP Indicates up or down (DN) Max safe flap down speed = 85 MPH (ASI reduces by 5 MPH when 'DN' due to drag)

GEAR indicates up or down (DN) Max safe gear 'DN' speed = 90 MPH (ASI reduces by 5 MPH when 'DN' due to drag)

N.B. If you exceed either max safe speeds or the max safe speed for the whole aircraft (145 MPH) then you will crash.

DME (Distance measuring equipment) Measures miles from the beginning of the runway. N.B. As you pass the beginning of the runway the figures increase again.

RPM (Engine Power) Max 2500, MIN 800. N.B. If you run out of fuel RPM will reduce to 800.

To land successfully you must stall the aircraft onto the first 0.2 miles of the runway (Flap down i.e. less than 60 MPH). From a height of less than 10 ft, with a descent rate of 300 ft per minute or less, wings level, gear down (you will hear the tyres squeak on landing).

When an aircraft 'stalls' it can no longer fly. At any altitude above 10 feet this will damage or crash the aircraft - an aircraft will stall when ASI is less than the stall speed (normally 70 MPH) - when you lower the flaps the stall speed reduces to 60 MPH - this allows you to fly slower, safely. N.B. If you are in a banked turn the stalling speed increases by 5 or 10 MPH (depending on the angle of bank).

MODE 2 - Heading South East (130) roughly towards the NDB (E) level at 2000 feet.

INSTRUMENTS - As per MODE 1 PLUS:

ADF E (Automatic Direction Finder) This is an instrument which has a pointer which points to the NDB (Non-Directional Beacon) (East in this case), which is situated at four miles from touchdown in line with the ILS centreline. The needle points relative to the aircraft direction such that if the aircraft is pointing straight at the NDB the pointer points straight up e.g. if the pointer is left of straight up, then turn left to home in on NDB.

When you pass over the NDB the pointer will swing around (Run Mode 5 A/Pilot and observe the effect at 4 miles) having found your way to the NDB you now have to turn in to "establish" on the ILS. The easiest way to do this is to fly past the NDB on a South Easterly heading for four or five cycles and then turn left to the ILS. Navigational accuracy to the NDB is measured only on the first pass (not as you pass it inbound on the ILS) Max 50%. You must judge your own moment

to commence descent (bearing in mind the glide slope and mountains).

MODE 3 Heading North towards the VOR (VHF Omni-Directional Range)

INSTRUMENTS As Mode 2 Except:

VOR This is a different kind of radio beacon which produces beams radially (like the spokes of a wheel). You have preselected the 360 radial. The instrument shows the relative position of the beam in the same way as the ILS centreline (inbound heading now 360). DME in this case shows distance to run to VOR ADF W - there is a second NDB situated at the same place as the VOR (W standing for West) the pointer now points to it.

When you pass the VOR/NDB W make a right turn, select the ILS (by holding down key 'I') which gives you NDB E and the ILS as in Mode 2, continue as per Mode 2.

Navigational accuracy is assessed on VOR and NDB E (Max 100%).

MODE 4 TAKE OFF - On the runway with take off power selected.

INSTRUMENTS As per Mode 3.

You must take off the climb to an altitude high enough to cross the hills. You may either climb straight ahead to an altitude clear of the hills or you may intercept the radial 360 from VOR (as already selected) which will take you through the narrow valley west of the airfield. If you climb straight ahead you may use ADF W to home in on the VOR/NDB W, then continue as per Mode 3.

MODE 5 AUTOPILOT In this Mode the computer selects a position as per Mode 1 - Finale, and will fly itself down the ILS and achieve a landing. Each time the Autopilot makes a control change the computer will BEEP. If you wish to take control of the computer approach then press 'T'.

In all player controlled Modes the keyboard is scanned just after the short BEEP (cycle time about 2 secs) when taking control from Autopilot hold down 'T' until you hear the input BEEP (shorter than Autopilot BEEP).

CONTROL KEYS

EFFECT

7	Raises A/C nose	Speed decreases, rate of descent decreases (climb increases)
6	Lowers A/C nose	Speed increases, rate of descent increases (climb increases)
J-	Reduces engine rpm	Speed decreases, rate of descent increases (climb decreases)
K+	Increases engine rpm	Speed increases, rate of descent decreases (climb increases)
5	Bank left	A/C will turn left, heading will decrease and this will continue until opposite key (8) is used which will bank A/C right & level wings.
8	Bank right	A/C turns right, heading will increase etc.
4		Adjusts heading by 1 to the left without the need to bank

9	1 to the right
F	Raises or lowers flap
G	Raises or lowers gear
I	Changes VOR display to ILS display and ADF W to ADF E
T	Take control from Autopilot

GLOSSARY OF AVIATION TERMS

A/H	Artificial horizon
A/C	Aircraft
ADF	Automatic direction finder
ILS	Instrument landing system
DME	Distance measuring equipment
VNE	Velocity never exceed
WND	Wind given in compass degrees
HOG	Heading in compass degrees
ALT	Altitude in feet
VSI	Vertical speed indicator
RPM	Engine power
ASI	Air speed indicator
NDB	Non directional radio beacon
VOR	VHF Omni directional range
R	Radial