

# FLYING THE DC-8

## With the HJG DC-8 v2 Panel Series

The design for the first DC-8 was laid down in 1955. The avionics installed reflect its age. Do not expect the autopilot operation seen with today's jets. This one needs a lot of hand flying and concentration. The Sperry autopilot in these panels is an accurate depiction of the unit installed in the real aircraft. It has no capture functions: *"you can't set it and forget it"*.



The DC-8 is a big airplane. Planning is everything with this aircraft. You must stay ahead of it! The landing gear has a very long wheel base and a narrow wheel track. Ground handling isn't too difficult though if you plan ahead. In tight areas, slow down!

At MTOW, set the flaps to 15° or 25° (if runway is less than 7500 ft) and increase the thrust to 1.4 EPR, pause, THEN set required Take-off EPR (as per included chart). Expect the airplane to roll into the last 2000 ft of runway before reaching Vr (consult charts and set IAS bugs prior to engine start).

*\*NOTE:* In reality, DC-8s rarely takeoff with full fuel! Plan fuel load correctly to achieve correct performance. Fuel stops on trans-oceanic flights were not uncommon for the 8!

At Vr, **DO NOT PULL THE NOSE UP QUICKLY**. You'll hit the tail on the stretch 8s very easily. At V2 and positive rate of climb, select gear up and maintain a target speed of about  $V2 + 10$  to 15 (15° to 18° attitude). At 1000 ft above departure airport, reduce pitch angle to approx. 8°, set climb thrust (as per chart) and accelerate to 250 kts. Once you are at least  $V2 + 25$  and accelerating, select flaps UP. At, 10,000 ft ASL, accelerate to 300 kts for the climb, transition to Mach 0.78 when achieved and maintain it until level-off. Keep adjusting your climb thrust (as per chart) every couple of minutes to ensure you have proper thrust. If it won't climb at least 400 fpm at Mach 0.78, **LEVEL-OFF** (at a legal cruise altitude of course!). In that case you are "weight & temp (WAT) limited". You'll need to burn off fuel in order to get to a higher altitude. This is very common in real life.

Typical cruise in the DC-8 is up to Mach 0.82 as a realistic maximum. Mach 0.80 is most commonly used. FL310 or FL350 is best for westbound flights and FL330 (FL370 if light) for eastbound flights.

Plan well ahead for your descent! Maintain cruise Mach until you can transition to 300 – 310 kts. Approx. 2800 fpm descent rate will be required to follow a 3-to-1 profile. Monitor power and airspeed closely. Prior to 10,000 ft ASL decelerate to 250 kts. If you get high on profile, request a 360° turn from ATC or use the landing gear! Use of the spoilers in flight is **NOT APPROVED!** If you cheat the spoiler system, you'll get into trouble just like some real life DC-8 crews did. Inboard engine thrust reversers MAY be used in flight on DC-8s but we are unable to simulate that in MSFS.

Once in the terminal area or on downwind, 200 – 210 kts is minimum clean speed. Final vectoring or base leg should be flown Flaps 15 and 180 kts. On the inbound track: Gear Down, Flaps 25, Spoilers **"ARMED"** and 160 kts. On the slope/VASIS and prior to 1500 ft above arrival airport be at Flaps 35 and Vref (as per chart) + 5 + ½ steady wind + all the gust amount, to a maximum of Vref + 20.

\* **NOTE:** Flaps 50 (full) is for **EMERGENCY USE ONLY** (except on -72/-73s). Flaps 35 is the normal landing setting.

This model will fly a coupled approach very nicely down to CAT 2 minimums, but you must monitor and adjust the power closely! When the GPWS voice calls out “Twenty”, pull the power levers all the way back to the flight idle gate.

**DO NOT HOLD A NOSE HIGH ATTITUDE OR RAISE THE NOSE TO BLEED OFF SPEED.** You'll scrape the tail and waste precious runway! At no point should the pitch attitude exceed 6° nose up during the landing flare! Just hold her level/slight nose up and let her settle in. It is very important to touchdown in the landing zone (1000 ft marks), far more important than "greasing" it on. After all 3 gear are firmly on the ground, reverse thrust and brakes. Spoilers should deploy automatically. Expect the landing roll to be surprisingly long, be aggressive early with brakes if runway is short. This is not an airplane for small airports!



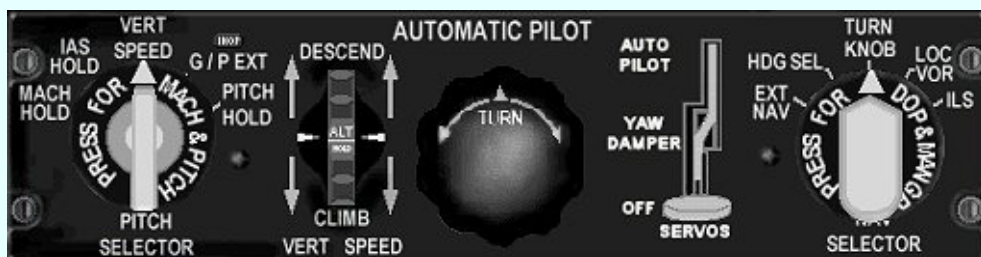
## ENGINE START

Here is what you must to do start the engines: *(start from an engines off situation)*.

- Open up the overhead (Shift 3) and Throttle (Shift 4) quadrant subpanels. **MAKE SURE** all engine fuel cutoff levers are at **OFF** (down) position.
- Turn **ON** the Battery switch.
- Call the ground support guy to plug in external electric power by pressing the "**MECH CALL**" button.
  - ★ You'll hear a short conversation asking you to make sure the parking brake is set then the **EXT PWR** light will illuminate.
- Move Battery switch to **EXT PWR** position.
- When ready to start (after doing all normal preflight preparations), move "Engine and Starter" rotary switch to **ARM**.
- Call the ground support guy to tell him you are ready to start Engine #3 by pressing the "**MECH CALL**" button again.
  - ★ You should hear a dialog again with him telling you that he's giving you some air and that you are clear on 3, then the sound of the ground air power cart can be heard.
- Pull the #3 start button (**Blue**), it should illuminate and N2 should slowly start to rise.
- At **NOT LESS** than 15% N2, move the Fuel Cutoff lever for #3 engine to **ON** (up).
- As N2 increases past 35%, push #3 start switch back in (**OFF**).
- Once #3 engine is started and stable, push **MECH CALL** to disconnect ground air (noise of ground air cart stops).
- Pushback, if required. When ready to start engines 4,2 & 1. Set park brake, push "**MECH CALL**" to let him know your about to start the other engines.
  - ★ Dialog will occur again saying you are clear on 4, 2 & 1)
- Move **ONLY** #3 engine throttle lever (press E key and then 3 on keyboard to select it only) up to achieve about 30 – 32 PSI on "Start Air Pressure" gauge (approx 80% N2).
- Start remaining engines one at time. (Pull **Blue** start switch, Fuel ON at > 15% N2, start switch **OFF** > 35% N2). 4, 2, & 1 is normal, but not required order.
- Bring #3 thrust back to IDLE. Turn rotary Starter & Ignition knob to **OFF**. Reselect all throttles (E + 1234 on keyboard). Release parking brake and have a good flight!



# AUTOPILOT USE



\* **REMEMBER: THERE IS NO AUTOMATIC ALTITUDE CAPTURE!** (Just like the real thing.) The altitude alerter has nothing to do with the autopilot system on most DC-8s. It is just for reminding the pilots what altitude they have been cleared to and to give an aural warning if that altitude is inadvertently deviated from.

## Departure:

- Hand fly, *AT LEAST*, until the flaps are up and you are stabilized in the climb at 250 kts with the climb thrust set.
- As soon as you engage the autopilot servos, current vertical speed (V/S) will be held (autopilot defaults to VERT SPEED for pitch & TURN KNOB for roll upon engagement).
- Move pitch mode selector to IAS HOLD. Move roll mode selector to HDG SEL (or what ever you need). IAS HOLD or MACH HOLD is the normal climb mode!
- At 10,000 ft, select the VERT SPEED pitch mode again and *GRADUALLY* (move a little, WAIT, then move a little, WAIT, etc) decrease your rate of climb to approx. 1000 fpm using the VERT SPEED thumbwheel. Allow the plane to accelerate to 300 kts.
- Once at 300 kts, re-engage the IAS HOLD pitch mode.

\*\* **REMEMBER: THERE IS NO AUTOTHROTTLE!** (Just like the real thing.) Thrust must be adjusted/tweaked *MANUALLY* to ensure climb thrust is set/maintained and engine limitations are not exceeded.

- Once you are indicating approx. Mach 0.78 (occurs at approx. 29,000 ft), move the pitch mode selector to MACH HOLD.

- 500 to 1000 ft prior to level off altitude, re-select VERT SPEED pitch mode and *GRADUALLY* start reducing the rate of climb to 500 fpm or less.
- As you *EXACTLY* reach the desired altitude, click on the center of the VERT SPEED thumbwheel. This will lock the autopilot altitude hold on the altitude at that very instant. It is normal & okay for it to momentarily overshoot initially, it will recover, provided that your rate of climb is less than 500 fpm at the time you center it.

### Descent & Approach:

- To descend, simply move the VERT SPEED thumbwheel, *GRADUALLY* to the desired rate of descent. VERT SPEED pitch mode is the normal mode used for descents. Airspeed is controlled by *MANUALLY* using the thrust levers.
- Again, to level-off... 500 to 1000 ft prior to desired altitude, *GRADUALLY* start reducing the rate of climb to 500 fpm or less.
- As you *EXACTLY* reach the desired altitude, click on the center of the VERT SPEED thumbwheel. This will lock the autopilot altitude hold on the altitude at that very instant. It is normal & okay for it to momentarily overshoot initially, it will recover, provided that your rate of climb is less than 500 fpm at the time you center it.
- HDG SEL is the preferred mode until your heading is within 30 degrees of an ILS inbound course (don't even bother trying anything greater than a 45 degree intercept angle!). LOC VOR or ILS can then be engaged. Airspeed should not be greater than 180 knots when attempting to intercept a localizer! Glideslope should only be intercepted from below (1 dot low or more until on the localizer).
- Disengage the autopilot *NO LATER* than 100 feet above ground (Cat 2 ILS limits) and land manually. There is no autoland capability on DC-8s!



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# Charts

## Take-Off V-Speeds

ALT - 1000 FT			AMBIENT TEMPERATURE - °F					
6 to 7			----	-20 to -15	-5 to 15	15 to 45	45 to 75	75 to 120
5 to 6			----	-20 to -5	-5 to 25	25 to 55	55 to 85	85 to 120
4 to 5			-20 to -5	-5 to 25	25 to 45	45 to 65	65 to 85	85 to 120
3 to 4			-20 to 15	15 to 35	35 to 55	55 to 85	85 to 100	100 to 120
2 to 3			-20 to 35	35 to 55	55 to 75	75 to 95	95 to 120	----
1 to 2			-20 to 45	45 to 65	65 to 85	85 to 105	105 to 120	----
0 to 1			-20 to 65	65 to 85	85 to 105	105 to 110	----	----
FLAP POS	WEIGHT - 1000 LBS.		V1 VR V2	V1 VR V2	V1 VR V2	V1 VR V2	V1 VR V2	V1 VR V2
25	315		137 151 162	139 152 161	141 152 161	142 152 161		
	300		132 146 158	134 147 157	136 147 157	137 148 157	139 149 157	
	280		126 141 153	127 142 153	129 142 153	130 142 152	132 143 152	134 144 151
	260		120 135 148	120 136 148	122 136 147	123 137 147	125 137 147	127 138 146
	240 VBASIC		112 128 144	113 129 143	115 129 142	116 130 142	118 131 142	120 132 141
	220		-- 122 139	107 122 136	108 122 137	109 124 137	111 125 136	113 126 136
	200		-- 120 138	-- 118 135	-- 115 132	101 117 132	104 118 131	105 119 130
	180		-- 120 140	-- 118 137	-- 115 133	-- 110 127	94 110 125	99 111 125
	V1	NORM	120 - -	118 - -	114 - -	110 - -	107 - -	103 - -
	LIMIT	WET/DRY	108 - -	105 - -	102 - -	99 - -	94 - -	89 - -
15	315		139 155 168	142 156 168	144 157 167	145 158 167	147 159 167	
	300		135 151 164	137 152 164	139 153 164	140 154 163	142 155 163	144 156 163
	280		128 145 159	130 146 159	132 147 159	133 148 158	135 149 158	137 150 158
	260		122 139 154	124 140 154	125 141 153	126 142 153	128 143 152	130 144 152
	240 VBASIC		-- 132 149	117 133 149	118 134 148	119 135 147	121 136 147	123 137 146
	220		-- 125 144	-- 126 144	112 127 143	112 128 142	114 129 141	115 130 141
	200		-- 120 139	-- 120 138	-- 120 136	-- 121 136	107 122 136	107 123 135
	180		-- 120 141	-- 118 138	-- 114 132	-- 113 130	-- 114 130	101 115 129
	V1 LIMIT		120 - -	118 - -	114 - -	110 - -	107 - -	103 - -

Take-Off Thrust Setting (EPR)

NORMAL BLEED						
OAT °F	PRESSURE ALTITUDE (1000 FEET)					
	SL	1	2	3	4	5 and above
120	1.64	1.64	1.64	1.64	1.64	1.64
115	1.67	1.67	1.67	1.67	1.67	1.67
110	1.70	1.70	1.70	1.70	1.70	1.70
105	1.72	1.72	1.72	1.72	1.72	1.72
100	1.75	1.75	1.75	1.75	1.75	1.75
95	1.76	1.76	1.76	1.76	1.76	1.76
90	1.77	1.77	1.77	1.77	1.77	1.77
85	1.79	1.79	1.79	1.79	1.79	1.79
80	1.80	1.80	1.80	1.80	1.80	1.80
75	1.81	1.81	1.81	1.81	1.81	1.81
70	1.83	1.83	1.83	1.83	1.83	1.83
65	1.84	1.84	1.84	1.84	1.84	1.84
60	1.85	1.85	1.85	1.85	1.85	1.85
55	1.85	1.87	1.87	1.87	1.87	1.87
50	1.85	1.89	1.89	1.89	1.89	1.89
47	1.85	1.90	1.90	1.90	1.90	1.90
45	1.85	1.90	1.91	1.91	1.91	1.91
40	1.85	1.90	1.93	1.93	1.93	1.93
35	1.85	1.90	1.95	1.95	1.95	1.95
32	1.85	1.90	1.96	1.96	1.96	1.96
30	1.85	1.90	1.96	1.97	1.97	1.97
25	1.85	1.90	1.96	1.98	1.98	1.98
20	1.85	1.90	1.96	1.99	1.99	1.99
15	1.85	1.90	1.96	2.00	2.00	2.00
14	1.85	1.90	1.96	2.01	2.01	2.01
10	1.85	1.90	1.96	2.01	2.02	2.02
5	1.85	1.90	1.96	2.01	2.03	2.03
0	1.85	1.90	1.96	2.01	2.04	2.04
-5	1.85	1.90	1.96	2.01	2.05	2.05
-10	1.85	1.90	1.96	2.01	2.06	2.06
-12	1.85	1.90	1.96	2.01	2.06	2.06
-15	1.85	1.90	1.96	2.01	2.06	2.06
-20	1.85	1.90	1.96	2.01	2.06	2.07
-25	1.85	1.90	1.96	2.01	2.06	2.08
-30	1.85	1.90	1.96	2.01	2.06	2.09
-35	1.85	1.90	1.96	2.01	2.06	2.09
-40	1.85	1.90	1.96	2.01	2.06	2.10

Climb Thrust (EPR)

RAT °C				
	SL - 30T		35T	40T
50	1.46			
45	1.49			
40	1.52 ICING			
35	1.55 BLEED			
30	1.58 ON			
25	1.62 ↓			
20	1.65 ↓			
15	1.69 ↓			
10	1.73 1.66			
5	1.76 1.69			
0	1.80 1.72		1.75	1.72
-10	1.81 1.73		1.76	1.73
-3	1.82 1.73		1.77	1.74
-5	1.83 1.75		1.79	1.76
-10	1 T	1.86 1.77	1.83	1.79
-15	1.89 1.79		1.86	1.83
-16	2 T	1.90 1.80	1.97	1.94
-20	1.92 1.82		1.89	1.86
-25	1.95 1.84		1.92	1.89
-26	3 T	1.96 1.85	1.93	1.90
-30	1.97 1.86		1.95	1.92
-35	4 T	1.99 1.88	1.97	1.94
-40	2.01 1.89		1.99	1.96
-45	2.02		2.01	1.98
-48	5 T	2.03	2.02	1.99
-50	2.04		2.02	2.00

DC-8-50 Landing Reference Speeds (Flaps 35)

	GROSS WEIGHT - 1000 LBS													
	140	150	160	170	180	190	200	210	220	230	240	250	260	270
REF (IAS)	115	119	123	127	131	134	137	140	143	146	149	152	155	158