

ARCHIVED REPORT

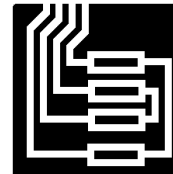
For data and forecasts on current programs please visit
www.forecastinternational.com or call +1 203.426.0800

McDonnell Douglas DC-8 - Archived 09/2003

Outlook

- Further hushkitting potential dims as DC-8 retirements accelerate
- Very modest TCAS II retrofits for remaining cargo variants

Note: Icons indicate area(s) of current retrofit/modernization activity



Orientation

Description. Long-range, four-engine transport.

Developer/Primary Manufacturer. McDonnell Douglas Corp, Douglas Aircraft Company, Long Beach, California, US.

Current Status. Production ended in 1972.

Total Produced. 576 DC-8s were produced.

Application. Long-range commercial transport accommodating 118 to 259 passengers.

Price Range. Prices on the used aircraft market at the end of 1998: DC-8-61CF, \$1.5 million; DC-8-62, \$1.25 million; DC-8-62CF, \$2.5 million; DC-8-63CF, \$4 million; DC-8-71, \$7.5 million; DC-8-71F, \$9 million; DC-8-73, \$10 million; DC-8-73F, \$12 million. Hushkitting adds \$2 million to \$3 million to the value of a used DC-8.

Technical Data

(DC-8-50)

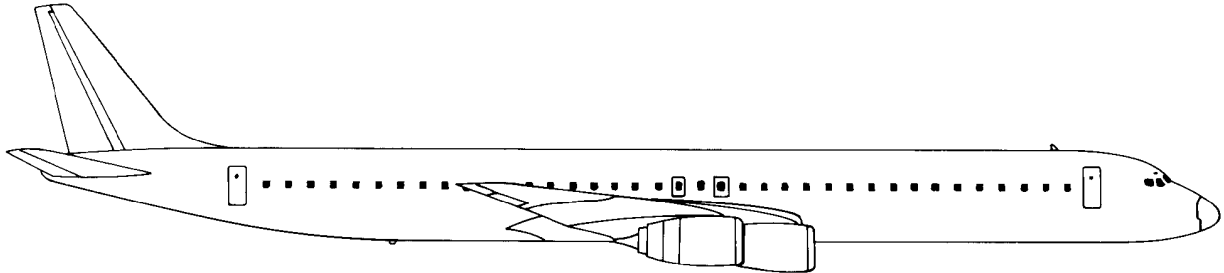
	<u>Metric</u>	<u>US</u>
Dimensions		
Length	45.88 m	150.5 ft
Height	13.21 m	43.33 ft
Wingspan	43.41 m	142.38 ft
Wing area	257.4 sq m	2,771 sq ft
Weight		
Empty equipped	60,022 kg	132,325 lb
Max loaded	142,883 kg	315,000 lb

Performance

Max cruising speed	932 kmph	502 kt
Range w/max payload	9,200 km	4,960 nm

Propulsion

Four Pratt & Whitney JT3D-3 turbofans		
Thrust (each)	80.1 kN	18,000 lbst

DC-8-70 SERIES

Source: Forecast International

Program Review

Background. The four-engine DC-8 was Douglas Aircraft's first commercial jet aircraft. The first DC-8 prototype, a Series 10 equipped with Pratt & Whitney JT3C-6 turbojets, first flew on May 10, 1958. Over the next 14 years Douglas produced a series of DC-8 models, all of which, with the exception of the Series 40, were equipped with Pratt & Whitney turbojet or turbofan engines.

Early DC-8 Series 10-50 aircraft evolved in the mid-1960s to the Super 61, 62, and 63. Each Super Series model featured more powerful engines and fuselage plugs that stretched the aircraft 6 feet 8 inches (in the Super 62) or to a maximum of 36 feet 8 inches (in the Super 61 and 63). Concurrent with the development of the above aircraft in the 1960s was the design of a DC-8F combination passenger/freighter or all-freighter aircraft. Model designations include the 54, 55, Super 61F/61CF, Super 62F/62CF, and Super 63F/63CF.

A program to re-engine DC-8-61, -62, and -63 series aircraft with CFM International CFM56-2C1/2C3 turbofan engines was launched in 1979 under the management of CAMMACORP. Deliveries of the modified aircraft, redesignated Super 71, 72, and 73, respectively, began in April 1982 to Delta Air Lines and United Airlines, and continued until 1986 with the delivery of the 110th and final conversion to NASA. Each of the converted DC-8's CFM56 engines provides 22,000 lbst (97.9 kN), and together they make the DC-8 Super 70 Series aircraft among the quietest four-engine transports in service. In addition, the new engines offer reduced take-off run, increased range, and improved fuel savings.

In a move to meet US Federal Aviation Administration (FAA) noise regulations, an increasing number of DC-8 operators have turned to engine modification packages (known as "hushkits") that are designed to lower engine decibel levels, particularly during approach and landing. Details of these numerous programs may be found in the "Propulsion" section of this report.

Variants

DC-8-10. Initial version. Powered by Pratt & Whitney JT3C-6 turbojets rated at 60 kN (13,500 lbst) each. Intended for US domestic operations.

DC-8-20. Similar to Series 10 aircraft. Powered by P&W JT4A-3 turbojets rated at 70.3 kN (15,800 lbst) each.

DC-8-30. Initial intercontinental DC-8. Additional fuel tanks installed in wing center section.

DC-8-40. Powered by Rolls-Royce Conway R. Co.12 engines rated at 77.8 kN (17,500 lbst) each.

DC-8-50. Fitted with P&W JT3D-3 turbofan engines. Accommodates 189 passengers. Also produced in freighter versions DC-8-54F and DC-8-55F.

DC-8-61. Features lengthened fuselage. Accommodates maximum of 259 passengers.

DC-8-62. Ultra long-range version. Fitted with new wing.

DC-8-63. Combines length of the -61 variant with the wing of the -62.

DC-8-70. Upgraded Series 60 DC-8s installed with CFM56 engines. Designations are DC-8-71, DC-8-72, and DC-8-73.

EC-24A. One DC-8-54F converted by ElectroSpace Systems Inc for fleet electronic-warfare-support group (FEWSG) missions. The aircraft carries ECM, ESM, and C³CM systems and high-power broad-band jamming equipment. The aircraft was delivered to the US Navy in August 1987.

Milestones

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Jun	1955	Development begun
May	1958	DC-8 Series 10 prototype flight
Aug	1959	Series 10 DC-8 receives FAA certification
May	1961	FAA certification of Series 50
Sep	1966	Super 61 receives FAA certification
Jul	1967	Scheduled service of Super 63 begun
	1972	DC-8 production ends
Feb	1976	DC-8 passenger-to-freighter conversions begun
Aug	1981	First flight of Super 71
	1986	DC-8/CFM56 re-engining program ends

Worldwide Distribution

(As of June 1, 2002)

<u>Region</u>	<u>Country</u>	<u>Total</u>	<u>Variant</u>	<u>Avg. Age (Yr)</u>
<u>Africa</u>	Swaziland			
	African Int'l Airways	2	DC-8-54F	33
		1	DC-8-62AF	32
<u>Europe</u>	Belgium			
	Cargo Plus Aviation	2	DC-8-55JT	
	Ireland			
	Aer Turas Teoranta	2	DC-8-63	35
	Airplanes Group	2	DC-8-71F	32
		1	DC-8-73CF	31
	Spain			
	Cygnus Air	2	DC-8-62/AF	35
	Switzerland			
	Jet Aviation	1	DC-8-72	
UK				
MK Airlines	1	DC-8-54F		
	4	DC-8-62	33	
	4	DC-8-55F	34	
	2	DC-8-63CF		

<u>Region</u>	<u>Country</u>	<u>Total</u>	<u>Variant</u>	<u>Avg. Age (Yr)</u>	
<u>North America</u>	United States				
	Aerolease Int'l	1	DC-8-62CF	32	
		3	DC-8-63/CF	31	
		7	DC-8-73/AF/CF	31	
	Air Transport Int'l	5	DC-8-62F/CF	31	
		5	DC-8-63/F/CF	30	
		10	DC-8-71F	29	
	Airborne Express	8	DC-8-61F	32	
		6	DC-8-62F	33	
		17	DC-8-63/AF/CF	32	
	<u>North America (cont)</u>	United States (cont)			
		Atel Leasing	1	DC-8-63F	31
			1	DC-8-71F	32
		Churchill Leasing	2	DC-8-62AF	32
			7	DC-8-54	33
		DHL	7	DC-8-73F/CF	32
		Emery Worldwide	2	DC-8-54	34
		1	DC-8-62AF	34	
		1	DC-8-63F/CF	31	
		5	DC-8-71/F	32	
Fine Air		1	DC-8-51		
		3	DC-8-54JT		
		2	DC-8-61F		
		7	DC-8-62/AF/F		
		4	DC-8-63/CF/F		
GE Capital Aviation Services		2	DC-8-71F		
		2	DC-8-73F		
International Air Leases		2	DC-8-62F	34	
Kalitta Air		2	DC-8-62AF/CF		
Murray Aviation		2	DC-8-63CF	32	
Nationsbanc Leasing		2	DC-8-71F		
New England Merchants Leasing		3	DC-8-63F		
Republic Financial Corp.		2	DC-8-73CF		
UPS		23	DC-8-71F/CF	31	
		26	DC-8-73F/CF	31	
Zantop		2	DC-8-54	36	
<u>South America</u>		Brazil			
	Transportes Charter do Brasil	1	DC-8-52	36	
		2	DC-8-63CF	34	
	Chile				
	LANChile	2	DC-8-71F	29	
	Colombia				
	Arca	1	DC-8-43	36	
	Tampa Colombia	3	DC-8-71F	34	
	Ecuador				
	Aeroshell	1	DC-8-62	32	
	Peru				
	Aeronaves del Peru	1	DC-8-54F	36	
		1	DC-8-61F	34	

Note: The airlines listed in the chart above are the operators of the aircraft, and not necessarily the owners. The following are military/government DC-8 operators:

<u>Region</u>	<u>Country</u>	<u>Total</u>	<u>Variant</u>	<u>Avg. Age (Yr)</u>
<u>Africa</u>	Gabon Gabon Government	1	DC-8-73F	33
<u>Europe</u>	France France Air Force	3	DC-8-72CF	38
<u>North America</u>	United States NASA	1	DC-8-72	32
<u>South America</u>	Peru Peru Air Force	2	DC-8-62CF	35

Opportunities

The remaining DC-8 freighters are being retired at accelerated rates due to slumping cargo traffic and this should effectively preclude any TCAS II retrofits of note.

The softening market is also expected to inhibit further DC-8 hushkitting opportunities. Overall, we are anticipating only about 15 additional hushkit retrofits for the four-engined Douglas design.

PROPULSION

Stage 3 Hushkits. Several firms have offered hushkits allowing DC-8 operators to meet the even more stringent FAA Stage 3 and International Civil Aviation Organization (ICAO) Chapter 3 noise reduction requirements that came into effect at the end of the 1990s.

Quiet Technology Venture (QTV), which had previously developed a DC-8 Stage 2 hushkit that was fitted to 60 -50 and -61 variants, obtained a supplement type certificate (STC) for a -50 Stage 3 kit in mid-1997. Fine Air (which owns QTV) ordered 15 shipsets of the new kit, and QTV has reported total sales of more than 30 shipsets. The kits carry a \$2.5 million price per set.

Burbank Aeronautical Corp signed contracts with MGM Grand Air to develop a Stage 2/3 hushkit for the JT3D-7-powered DC-8-62/-63s. The kit contains an extended inlet cowl and an extended nose cone bullet. In 1990, Burbank received an STC from the US FAA for this hushkit. The company has delivered more than 75 of the kits to date, at about \$3.15 million per aircraft.

Burbank has also developed Stage 3 kits for the DC-8-50/61 variants, and although the company had been looking at a potential market for some 45 shipsets, the events of September 11 have dimmed this outlook.

ELECTRONICS

Cockpit/Avionics Upgrades. Dee Howard of San Antonio, Texas, has retrofitted a new "glass cockpit"

package aboard 49 DC-8-70s operated by United Parcel Service.

The Rockwell Collins digital avionics upgrade includes the EFIS-86 electronic flight instrument system, APS-85 digital autopilot, ADS-85 air data system, WXR-700 weather radar, Litton LTN-92 ring laser gyro inertial nav system (INS), and new navigation sensors.

In 1997, Universal Avionics Systems was chosen to supply a GPS-based flight management system for eight Arrow Air DC-8-60Fs.

Honeywell has developed a Full Aircraft Management/Inertial System (FAMIS) package to replace existing INSs on older aircraft. The suite, of modular design, includes a new INS and a flight management system incorporating laser gyros, a global positioning system (GPS), and satellite communications. FAMIS is targeted at 747-100/ -200/-300, L-1011, DC-8, DC-10, and A300 transports.

Most of the DC-8s in service had already received such upgrades prior to September 11, and the accelerated retirements of the aircraft since that date will all but preclude further opportunities in this area.

TCAS II. Since December 31, 1993, all commercial airliners seating 30 or more passengers operating in US airspace have been fitted with a Traffic Alert/Collision Avoidance System (TCAS II) as mandated by the US FAA. TCAS is a family of airborne systems that operate independently of ground-based ATC systems. According to FAA officials, current TCAS II devices feature state-of-the-art Version 6.04A software that significantly reduces the false alarm rate.

Both Rockwell Collins and Honeywell manufacture TCAS II systems, which cost \$120,000 to \$145,000 each. TCAS II manufacturers will continue to refine and upgrade this equipment in the years ahead.

TCAS II retrofits in the United States will get a further boost from the FAA's recent ruling requiring this equipment for all US-registered freighters. Collision-avoidance systems were mandated for passenger-carrying transports in 1987, but all-cargo/freight transports were specifically exempted at the time.

In anticipation of the ruling, UPS announced it would begin fitting automatic dependent surveillance-broadcast (ADS-B) systems to 90 of its 727 and DC-8 aircraft.

FI's Opportunity Outlook

Program	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
---------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

PROPULSION

Stage 3 Hushkits

Anticipated <=====> 10-15 DC-8 (Int'l)

Program	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
---------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

ELECTRONICS

Cockpit/Avionics Upgrades

Available <=====> 10-15 DC-8 (Int'l)

TCAS II

In Progress +==> 10-15 DC-8 (US, Int'l)

Anticipated <=====> 20 DC-8 (US, Int'l)

Program	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
---------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
