

# CFE Company CFE738

**Turbofans**  
**April 2017**

## Program Briefing

The CFE Company is a 50/50 joint venture company between General Electric and Honeywell (then Garrett) formed to develop the 6,000-lb-st CFE738 for the corporate jet market.

The engine was chosen as the power plant for the Dassault Falcon 2000 in 1990, two years after the launch of the program. The CFE738 was unable to follow the success of the Dassault Falcon 2000 program, however, when the Pratt & Whitney Canada PW307 won the 2000EX application.

Honeywell has long moved on with development of the HTF7000 family of turbines in the same power class. GE has not yet announced a competing turbofan, which would be at the lower end of its power range.

Teal Group expects no further applications to appear for the CFE738,



### Quick Specs:

Power Class:	5,957 lbst (26.5 kN)
Bypass & Pressure Ratios:	5.3:1 & 23:1
Airflow:	210 lb/sec (95.3 kg/sec)
SFC:	0.369 lb/lbst-hr (10.5 mg/Ns)
Configuration:	1F; 5A+1C HPC; Annular; 2A HPT; 3A LPT

eventually leading to slow production in support of the existing Dassault Falcon 2000 fleet.

## Manufacturers

CFE Co.  
P.O. Box 62322  
111 S. 34th St.  
Dept. 67-60  
MS 503-3J  
Phoenix, AZ 85082-2332  
tel: (602) 231-4570  
fax: (602) 231-5030

### Partners in CFE Co.

- GE Aviation, Cincinnati, OH
- Honeywell International, Phoenix, AZ

## Summary Forecast

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Units Produced	—	—	—	—	—	—	—	—	—	—	—
Value (2017 \$ Millions)	—	—	—	—	—	—	—	—	—	—	—

## Technical Description

### Components

#### Fan

Single-stage fan with 28 inserted titanium blades with part-span dampers and pointed spinner. Front end of LP shaft held in a high-capacity bearing. Pressure ratio is 1.7:1. Mass flow of 240 lb/sec (109 kg/sec). Bypass ratio is 5.3:1. Driven by LP turbine.

#### HP Compressor

Five axial stages followed by a single centrifugal stage. The first three stator stages are variable.

#### Combustor

A centrifugal diffuser leads to single annular combustor with 15 fuel nozzles.

#### LP Turbine

Three axial stages drive the fan.

#### HP Turbine

Two axial stages of single crystal design driving the HP compressor.

#### Other Components

Engines are equipped with a Honeywell FADEC.

### Specifications

#### (Imperial Units)

Model	Thrust (lbf)	Pressure Ratio	Bypass Ratio	Airflow (lb/sec)	Cruise SFC (lb/lbf-hr)	Max. Dia. (in)	Length (in)	Weight (lb)
CFE738-1-1B	5,957	23:1	5.3:1	210	0.369	48	99	1,325

#### (Metric Units)

Model	Thrust (kN)	Pressure Ratio	Bypass Ratio	Airflow (kg/sec)	Cruise SFC (mg/Ns)	Max. Dia. (m)	Length (m)	Weight (kg)
CFE738-1-1B	26.5	23:1	5.3:1	95.3	10.5	1.219	2.514	601

### Applications

Engine	Aircraft	Engines per A/C
CFE738-1-1B	Dassault Aviation Falcon 2000	2



Falcon 2000 powered by two CFE738-1-1Bs

## Marketing Data

### Costs

Although active production of the CFE738 is winding down, we estimate a list price of just under \$2 million for each engine.

### The Competition

The CFE738 competed in the same power class at the Pratt & Whitney Canada PW300, Rolls-Royce AE3007 and the Honeywell HTF7000.

### Delivery History (production engines; estimated)

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>		
CFE738-1-1B	—	3	4	30	48	40	45	76		
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>Total</u>
CFE738-1-1B	67	84	70	28	23	14	11	1	—	544

## Milestones

<u>Date</u>	<u>Milestone</u>
June 1987	Garrett Engine Div. of Allied Signal and GE Aircraft Engines form CFE Co.
Apr. 2, 1990	Dassault selects CFE738 for Falcon X (Falcon 2000)
Mar. 4, 1993	First flight of Falcon 2000
Dec. 17, 1993	CFE738-1 certificated by FAA
Feb. 2, 1995	FAR Pt 25 and FAR Pt 36 Stage 3 noise level certification
Feb. 16, 1995	First delivery of Falcon 2000

## Program Overview

### Background

#### Engine Development

CFE Company was established in June 1987 as a joint venture between General Electric Aircraft Engines and Garrett Engines to develop a new 5,000- to 7,000-lb-st turbofan for the business and regional jet market using a combination of demonstrated off-the-shelf components.

GE provides the core which essentially is that of the GE27 turboshaft developed by the company for the US Army under the Modern Technology Demonstrator Engine (MTDE) program. Also, the engine uses aspects of the T407/GLC38 program. GE ships completed cores, including the

engine control system, to Phoenix for completion.

Garrett contributes the fan, turbine and accessory gearbox, based on the successful TFE731 engine. (Garrett Engines was subsequently taken over by Honeywell.)

#### Power for the Falcon 2000

On Apr. 2, 1990, Dassault announced that it had selected the CFE738 to power its new Falcon X business jet (later renamed the Falcon 2000). First flight of the aircraft occurred on Mar. 4, 1993. First delivery took place Feb. 16, 1995.

#### Initial Version of the CFE738

The first version of the engine, the CFE738-1, was certificated by the FAA on Dec. 17, 1993. Deliveries for the Dassault Falcon 2000 ensued shortly thereafter.

#### Only the Falcon 2000

The engine was unable to win any other applications beyond the Falcon 2000, most notably the follow-on Falcon 2000EX, and other possible airframes were cancelled (including the Falcon 9000 and Shorts FJX). Extended production is only expected as support for the Falcon 2000 program.

### Teal Group Evaluation

As one of the joint venture partners of the CFE Company, Honeywell has long signaled the demise of the CFE738 turbine through its development of the modern HTF7000

turbofan in generally the same power-class (see report herein).

The other partner in the joint venture, General Electric, has not yet shown (or divulged) serious interest

in producing a turbofan engine in the power class beyond their failed attempt at purchasing Honeywell.

Teal Group does not expect any further applications for the CFE738.

### Production Forecast

Units	Through 2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
<b>CFE738-1/1B</b>												
Falcon 2000	544	—	—	—	—	—	—	—	—	—	—	544