The DC-8-61 BECOMES The DC-8-71

The DC-8-61 is going through a transformation and, although it will not dramatically change the look of the airplane, the modification will prolong the life span of the plane at least a decade.

When the first Delta DC-8-61 to complete the modification returns to the fleet next month, it will have a new identity, the DC-8-71, and in fact, will be a new generation aircraft in terms of fuel efficiency and noise levels, according to C. Julian May, vice president—engineering.

New federal requirements for noise levels and operational demands for fuel efficiency recently made retirement seem inevitable for the DC-8. But the Los Angeles management corporation CAMMACORP, working with McDonnell Douglas, developed a plan to modify the DC-8 aircraft to meet those new requirements.

May said since both the noise and fuel problems with the DC-8 originate with the engines, the most crucial part of the modification is the installation of new General Electric/SNECMA CFM56 engines, replacing the Pratt and Whitney JT3D engines.

The CFM56 features a low noise level and low fuel consumption. It has a certified 24,000 pound takeoff thrust (which will operate at 22,000 pounds) and a low pollutant factor. The DC-8-71 consumes approximately 20 percent less trip fuel than the DC- 8-61, with a corresponding increase in the aircraft range.

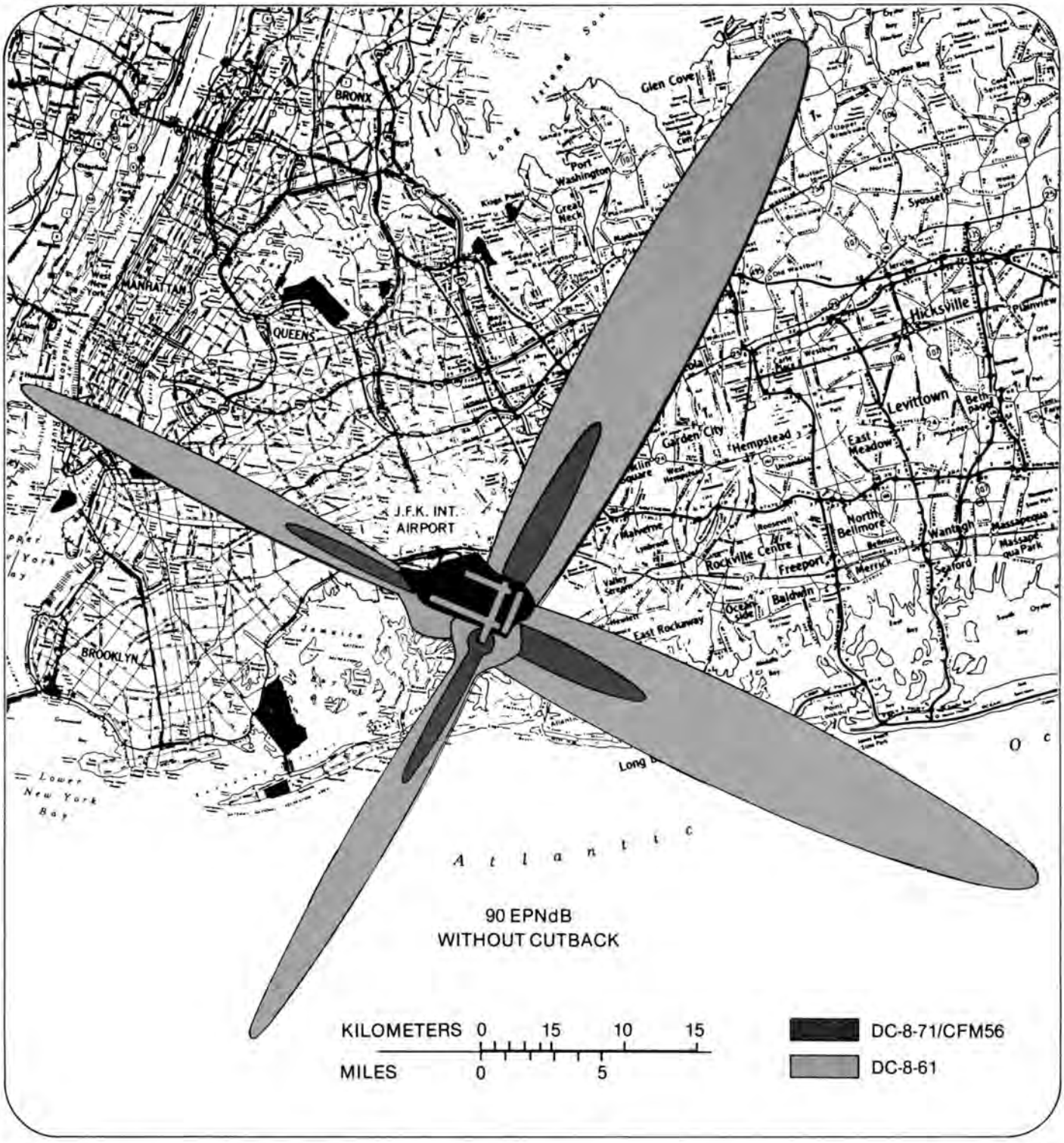
The new engine will also mean greater performance at takeoff. The new Series 71 aircraft can develop up to 16,000 pounds more thrust and use about 10 percent less runway than the Series 61. The gained performance applies to high-altitude, hot-temperature airports, as well as airports near sea level. In addition to this new takeoff performance and the greater range, the cruising altitude may be increased up to 4,000 feet.

The new engines make the DC-8-71 a "good neighbor" aircraft with noise levels that comply with the same noise certification regulations that new technology aircraft are required to meet, according to May. Noise levels are approximately 13 decibels quieter than those of the DC-8-61. In some areas, this equates up to a 90 percent noise reduction. Residences and businesses adjacent to metropolitan airports will find aircraft noise levels significantly reduced.

Honeycomb, acoustical suppressive material, and inlet and exhaust duct design account for some of the engine's noise suppression, but its quiet nature is primarily due to the high-bypass ratio. This same bypass feature is also a contributing factor in the CFM56's fuel economy.

The catalyst behind the program to extend the life of the DC-8 aircraft through re-engining has been CAMMACORP which acts as the exclusive contracting company. Headed by Jackson R. McGowen, former president of McDonnell Douglas-West, Long Beach, California, CAMMACORP has a management team made up of a cross-section of aerospace executives and specialists. As the program manager, the corporation oversees contract negotiations with the airlines and manufacturers concerning engineering, procurement, marketing,

DC-8-71 Will Be A Good Neighbor



NOISE LEVELS *of the DC-8-71's General Electric/SNECMA CFM56 engine comply with the same noise certification regulations that new technology aircraft are required to meet. Residences and businesses adjacent to metropolitan airports will find aircraft noise levels significantly reduced. The areas surrounding John F. Kennedy International Airport in New York City affected by aircraft noise will be dramatically reduced as shown in the drawing above.*

MODIFICATION OF THE FIRST DC-8 *at Delta's Technical Operations Center in Atlanta began on February 1 and will be completed next month. Hundreds of hours of training were conducted for overhaul and aircraft maintenance personnel as they prepared to modify and maintain the DC-8-71 aircraft. A total of 300 mechanics, electricians and inspectors attended the 20-hour modification training classes and another 200 have attended the 20-hour maintenance classes.*

design and overall program coordination. Although CAMMACORP sought orders for the re-engining from the airlines, McDonnell Douglas is doing the engineering, development, modification and certification testing for the project. Today, the corporation has 94 firm orders and 40 options for the work from over a dozen airlines.

The project calls on CFMI (Commercial Fan Motor International) for the engines and reversers; AiResearch for air conditioning; Grumman Aircraft for the pylon and engine pods, Douglas Aircraft Company—Long Beach for engineering, flight tests and product support, and Douglas-Tulsa for the actual modification of most of the aircraft.

Conversion work on the aircraft of most airlines will be performed at the Douglas Tulsa facility, but Delta and the French Air Force will do most of their own conversion work. The first United DC-8-61 conversion was completed several months ago and that aircraft has completed the flight test program as the certification prototype. Although DC-8 Series 70 (DC-8-71 for Delta) is the common designator for the re-engined aircraft, the Federal Aviation Administration (FAA) is issuing a supplemental type certificate to the original DC-8 certification.

Conversion of the first Delta DC-8-61 was begun in November at the Douglas Tulsa facility. Modification of the first plane was done at the Douglas facility so Delta personnel could observe Douglas' modification methods. That plane, Ship 867, will re-enter service in the Delta fleet next month. Meanwhile, conversion on the first DC-8-61 (Ship 871) to be re-engined at the Delta Technical Operations Center in Atlanta began on February 1, and it too will re-enter service next month as a DC-8-71.

Many factors were weighed as Delta decided to do our own modification work, rather than contracting for the work to be done in Tulsa, May explained. "We can realize an additional airplane year of operation by doing our own work because of the flexibility we will have in planning the downtime," he said. "Also, by doing the work ourselves, we can combine the modification with routine maintenance."

Each aircraft will receive block maintenance while the re-engining is being completed. Such a block is required following each 20,000 hours of flying time. Certain structural sections of the plane receive a complete cleaning and inspection and are replaced or refurbished as necessary.

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THE DC-8-71 will begin regular service in Delta's fleet next month. The plane, modified from the DC-8-61, is a first generation jetliner that can compete with third generation aircraft in noise levels, fuel economy, range and performance. The DC-8-71 consumes approximately 20 percent less trip fuel than the DC-8-61, with a corresponding increase in the aircraft range. All 13 Delta DC-8s should be modified by early 1984.

DC-8-71

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In addition to the re-engining and block maintenance, each plane will also receive a new air conditioning system, a seating reconfiguration featuring new seats, and a modernization of flight instruments. A modification will also be made to the wing skin to increase its strength and to extend the life of the wing structure.

The air conditioning system, cooled by Freon on the DC-8-61, is being replaced by an air cycle system similar to the B-727 installation. The seating of the plane is being reconfigured from 198 passengers (with 172 in tourist and 26 in first class) to 212 passengers with 194 tourist and 18 first class. New light-weight seats will be installed which are designed to optimize knee room since the pitch between seats will be decreased from 34 to 32 inches in the tourist section.

Modifications to the flight instruments of the DC-8 include the modernization of the vertical speed, attitude, compass and radio altimeter indicators. A horizontal situation indicator will also be added. Also the OMEGA navigational system (presently used on the L-1011) is being installed. This system will increase the aircraft's versatility for over water and long-range flights.

Delta's 220 DC-8 pilots will receive five to eight hours training on the new flight instrumentation which is similar to that of the B-727.

Hundreds of hours of training were conducted for overhaul and aircraft maintenance personnel as they prepared to modify and maintain the DC-8-71 aircraft. Last June, Ground Training assembled a team of instructors from Maintenance, Quality Control and Ground Training who spent five months in vendor schools. Later they observed the modification of the DC-8 at the McDonnell Douglas facility in Tulsa. Information about the modification was assembled in two training guides—one covering the modification itself and another covering the maintenance of the modified plane.

When Delta began its first in-house modification of the DC-8-61, 300 mechanics, electricians and inspectors had attended the 20-hour modification training classes and another 200 had attended the 20-hour maintenance classes. Training will continue for Line Maintenance personnel as the modification continues and at least 200 mechanics at Delta's line stations will have received the DC-8-71 training by the time the aircraft enters scheduled service.

All 13 Delta DC-8-61s should be modified to DC-8-71s by early 1984, according to May. Each modification requires 42,000 man hours of work by the Delta maintenance departments. May pointed out, however, that many of those hours are spent on the routine block maintenance that the aircraft would have received anyway.

So, Delta's DC-8-61s become DC-8-71s, first generation jetliners that now can compete with third generation aircraft in noise levels, fuel economy, range, and performance.

THE INTERIOR of the DC-8-71 *will also have a new look as the seating of the plane is reconfigured from 198 to 212 passengers. New light-weight seats will be installed throughout. Also the air conditioning system, cooled by Freon on the DC-8-61, is being replaced by an air cycle system similar to the B-727 installation. Michael Parker works on the interior of the plane which has been stripped of its old furnishings.*

NEW ENGINES *are just one of the modifications being made as the DC-8-61 becomes the DC-8-71. A modification to the wing skin will increase its strength and extend the life of the wing structure. Working on the first DC-8 aircraft to be modified at Delta's Technical Operations Center are, left to right, Rick Loffert, Dwight Hallock, Alan Lockwood and Randy Hawkins.*