

FLIGHT TIMES

737
SPECIAL



REFLECTING:

737 Becomes Boeing No. 10 In Western's Family Album

The 737 comes from a long and distinguished family of Boeing aircraft that have flown the Western route system. It is, in fact, the 10th on a list of Boeing-built aircraft that stretches back to 1929.

The first Boeing plane to carry the Western insignia was the Model 204 flying boat. It was used on the Catalina Island run in 1929-31.

In 1930, the open-cockpit Boeing 95 biplane joined the fleet. It was followed that year by the Model 40-B-4, also a biplane. The pilot sat in an open cockpit, while four passengers sat in an enclosed cabin.

Western took delivery of its first multi-engine Boeing in 1935. It was the famous 247D. Western used nearly 40

of them, owning some, leasing others, and acquiring several through mergers.

Two rather obscure Boeing planes crept into the company's family tree of aircraft: the Boeing 80A and the Monomail. Both were used extensively by some other airlines, but played only minor roles with Western.

The 80A was used by National Parks Airways (acquired by Western in 1937) for scenic flights over Yellowstone National Park. The two Monomails were operated by Inland Air Lines, acquired by Western in 1944.

For almost 20 years, no Boeing planes served Western. But when they returned to the fleet in 1960, it was in a big way: the 707 jet. Western leased two of them, bringing the company into

the age of jet travel.

The following year, the 720B fanjet donned Western's livery. Today, the company has 27 of the four-engine jets, comprising the bulk of Western's fleet.

The merger with Pacific Northern Airlines in 1967, added three 720s to the family.

When the thirtieth 737 is delivered in 1969, it will outnumber all other types in the fleet.

The new 707-300C intercontinentals and 727-200 trijets, scheduled for delivery to Western this year and next, will be the 11th and 12th Boeing aircraft types to join Western.

No other airline in the world has flown more Boeing aircraft types than Western.





A Longer Shadow

To Our Customers, Employees and Friends:

Western's 737s have arrived.

As a fitting climax to long months of planning, testing and training – and in the anticipation of new jet service – inaugural flights to Western cities are being hailed with champagne toasts and ribbon cuttings.

The 737's passengers, residents of communities to which the new jet delivers mail and cargo, and Western employees will benefit from the presence of these new aircraft on the airline's system.

The 737 represents progress – the first jet service to a number of cities, increased schedules and greater comfort to others, and improved job opportunities for thousands of men and women who work in and around these aircraft.

When an airline invests well over \$100 million (that's the cost of the 737 order not counting training, construction of hangars and other necessities) in an aircraft designed to provide shorthaul service, it does so with the confidence that the aircraft will be operated efficiently and will be accepted by the traveling public.

Covering the purchase price alone of the 737s means

selling the equivalent of 7.6 million San Francisco-to-Los Angeles tickets at \$13.50 each or 1.7 million \$60 tickets between Calgary and Denver. To cities that have been served by 94-passenger Electras or 92-passenger DC-6B's, 737s will be providing increased schedules, faster flights and 107 seats to fill.

Experienced Western employees know this means working at top efficiency while providing pleasant and safe ground and in-flight services. To employees systemwide, the 737s bring better jobs and working conditions while increasing future opportunities.

The 737's customers are encouraged to enjoy its comforts and the Jet Age conveniences it brings to their communities while keeping in mind that their continued patronage is, in fact, an investment in improved and expanded air service with the most modern equipment.

It's this sort of "joint venture" that has brought the airline industry into the jet business and has given the U.S. the finest transportation system available anywhere in the world.

In the development of every transport aircraft there is always an individual or a company that makes a contribution which results in a better product than was originally designed by the aircraft manufacturer. In some cases, were it not for the requirements of one airline, the aircraft might not have been built at all.

Two companies, located more than 5,500 miles apart, played major roles in the development of the Boeing 737. They are Lufthansa, the German airline, and Western.

But for an executive of Lufthansa, the newest member of the Boeing family of commercial jet transports might never have left the drawing boards.

Without Western's demands, the twin-jets might not have had the airport versatility they now have.

Gerhard Hoeltje, chief technical executive of Lufthansa, began his association with the plane which ultimately became the 737 in late 1962, when he directed Lufthansa engineers to study requirements for a "Type X" transport — a shorthaul jet liner for domestic German routes.

Lufthansa studies continued in 1963 and 1964, and the carrier decided that it wanted an 82-passenger plane capable of carrying 44 pounds of baggage for each traveler and about 1,000 pounds of cargo over ranges up to 500 nautical miles.

Hoeltje evaluated the other twinjet models and in 1964 visited Boeing, which had not yet decided to go ahead with the 737. Lufthansa's board of directors postponed their decision on shorthaul jets until February 1965.

On Feb. 9, 1965, (10 days before the decision was to be made), "We had a letter from Boeing saying the company would proceed with the 737 program subject to completion of a satisfactory sales agreement with Lufthansa," Hoeltje recalls.

Heavily committed with its Model 727 program at the time, Boeing obviously had hoped to sign more than one customer before embarking on a major new commercial project. It also knew that it well could see Lufthansa go for the DC-9 if it delayed its decision beyond the German carrier's February 1965 board meeting. Hence, Boeing decided to proceed with just the Lufthansa order.

Special Needs of Western, Lufthansa Provide Better Plane For All to Fly

By ROBERT L. TWISS
Seattle Times Aviation Editor

Later sales, including major 737 purchases by such major domestic airlines as Western and United, have borne out the Boeing judgment. Free-world carriers have ordered more than 210 Model 737s so far, and Boeing is looking forward to a production run extending well into the 1970s.

Other carriers, Western in particular, influenced the 737's design. As a result of discussions with Stanley R. Shatto, Western's executive vice president, and other airline executives, Boeing realized it would have to add wing span and area to meet Western's operational requirements at airports such as mile-high Denver on hot summer days.

"Because Western insisted on an aircraft that would meet certain altitude and temperature conditions, we redesigned the wing and the other airlines ended up getting a better airplane than they originally bought," a Boeing designer said.

Carrier faith in the 737 has been vindicated by the twinjet's performance in its early service.

In Germany, for example, where the 737 entered scheduled service in February 1968, the plane's passenger appeal led to many travelers' requests for the 737 flights.

Dispatch reliability of the 737 was exceptionally high in its introductory period, and Lufthansa extended service to several major German and other European cities as more transports of its

24-plane 737 order were delivered.

Model 737 service began in the United States in late April in the Midwest and East, and now the 737 is seen in the Far West with the distinctive markings of Western Air Lines.

Despite the late start of the 737 in competition with the Douglas DC-9 and British Aircraft Corp. Model 111, Boeing has great sales hopes for the plane. When the first 737 was christened last year, 17 airlines had announced orders for 129 of the new transports.

At a comparable time in the highly successful 727 program, five lines had bought 127 trijets. The 17 Model 737 buyers constituted a record number by first flight of any airliner in history. More carriers have ordered the 737, and Boeing officials look forward to sales of more than 500, perhaps 600 or more, 737s by 1975.

Sales of more than 600 Model 737s would mean a commercial program totaling more than \$2 billion, indicating the 737's importance to Boeing and its employees.

The over-all 737 program has been later than Boeing had planned for several reasons. Production delays stemmed from the firm's rapid buildup to meet the world-wide demand for jet transports of all types and shortages of certain key skilled personnel and supplies.

Passenger response, however, indicates the sleek new 737 was worth waiting for.

Western First To Use Space Age Iceboxes

The astronaut circling the globe — or even walking around the launch pad at Cape Kennedy — or the surgeon performing delicate eye surgery, or the passenger enjoying an in-flight meal aboard one of Western's jets would seem to have little in common.

But all three are benefiting from a Space Age breakthrough in the field of cryogenics — literally in "keeping cool," by using gases super-cooled to their liquid state.

The small suitcase-like packs astronauts carry around and which are attached to their space suits by a hose are small refrigeration units containing liquid nitrogen to keep the astronaut cool in his suit.

Physicians use super-cooled gases to destroy diseased tissue and to preserve healthy organs awaiting transplant.

Passengers on Western's planes are eating food that has been kept cool through a new galley refrigeration unit which uses liquid nitrogen.

Developed by Airesearch Manufacturing Company, a division of the Garrett Corp. in Los Angeles, specifically for Western, the new liquid nitrogen galleys keep food colder, longer, more efficiently and cheaper than any other system used.

The first unit was installed on the company's first 737, is on use on WAL's 707s and will be on all subsequent aircraft delivered.



The new system is so good and so simple that it will no doubt be adopted by all the airlines, according to Airesearch. It was developed at Western's request to meet certain standards.

"Until now, no airline had a really satisfactory way of keeping food chilled," said Richard P. Ensign, Western's vice president of inflight services.

Ensign and his staff spent months in planning the new system, working closely with Airesearch, REF Dynamics, the galley makers, Union Carbide Linde Division, which supplies the liquid nitrogen, and The Boeing Company.

The U.S. Public Health Department requires food to be kept at no more than 45 degrees F. Forty degrees will be required when technically feasible. So Western decided to shoot for the 40 degrees now. At that temperature, there is almost no growth of bacteria. As the temperature increases above that point, bacteria multiply rapidly.

There are many advantages to the liquid nitrogen system. It is non-toxic and non-flammable. The liquid nitrogen, which is about -320 degrees F, is changed into its gaseous state and circulated through the food compartment. It completely envelops the food, insuring uniform cooling throughout the compartment. Also, nitrogen retards oxidation, or "wilting," of salads, keeping them fresh.

"The new system will let us vary the menu with foods that have to be kept cooler, such as salad dressings made with oil, and cream-filled desserts," said Ensign, who was a micro-biology student in college.

Simplicity is the keynote of the system. The liquid nitrogen storage tank, called a "Dewar," named after its inventor, is like a large vacuum flask and

is mounted beneath the cabin floor.

Here's how it works.

Liquid nitrogen is fed from the Dewar through a tube to a "heat exchanger" located in the top of the galley food compartment. On its way to the heat exchanger, the liquid nitrogen turns to gas. In the exchanger, it mixes with the air in the compartment and circulates throughout the compartment.

This insures even cooling throughout and eliminates so-called "hot spots" and "cold spots." Tests by Western show that there is no more than one degree temperature variation throughout the compartment.

The only moving part in the entire system is the thermostat — a spark plug-size component in the heat exchanger. This is preset to 40 degrees. In the company's new 707s, now being delivered, there is one compartment for frozen foods in which the thermostat is preset to zero degrees.

Liquid nitrogen can be obtained all over the world and is inexpensive — about four cents a pound.

Western's present galley refrigeration system consists of dry ice packs inserted in the back of the food compartment. Dry ice is expensive; it cools the food closest to it the best, which means uneven cooling; it does not reduce the temperature of the food but merely keeps the temperature about the same; and the system cannot be shut off when not in use as can the liquid nitrogen system.

With nitrogen, the food compartment can be cooled from 65 degrees to 40 degrees in a little over 20 minutes.

It's another "first" for Western, another in a long series of contributions the company has made to the development of the airline industry.

EASY REFILL — Liquid nitrogen tanks are mounted on front of Western's commissary trucks for convenient refilling, as demonstrated by Glenn Smith, during inflight food loading operations.





737s Carry 'Extra' Engines, Stairs, Can Travel Anywhere

From some angles, the 737 appears to be a "trijet."

A small exhaust duct in the tail cone of the plane, similar to that in the larger trijet, causes the confusion. The smoke emitted from the duct does come from a jet engine, and although not an engine in the usual sense, it is an important new feature on the 737.

This small engine actually gives the 737 electrical and air power when the aircraft is on the ground and the big engines under the wings are shut down. It is called the auxiliary power unit (APU), and it makes the 737 a self-sustaining aircraft.

While other aircraft need ground support equipment for starting the engines and providing cabin air conditioning the 737, with the aid of the APU, can be started anywhere — an obvious advantage at smaller stations, places of seasonal operation (such as West Yellowstone) or in case of alternate field landings.

The APU also can, if needed, be used while the 737 is in flight to provide back-up air for the cabin air conditioning and pressurization.

The unit is shock-mounted in a sound-proof compartment and is equipped with its own fire detection, warning and extinguishing system. It is designed for easy accessibility so that normal ground servicing, including refueling, may be accomplished while it is in operation.

THIRD ENGINE? — *Western mechanic George Whitehead checks small jet engine located in tail of company's new 737. This \$26,000 engine makes the 737 self-sustaining by giving it air and electrical power necessary for starting.*



EYE TO EARTH? — *Belly-view of 737 in flight shows another of the aircraft's new features: landing gears (tires) which are enclosed by an inflated rubber seal instead of behind heavy, hydraulically operated doors as on earlier planes.*



STEP RIGHT UP — *Housed in compartment below doorway, 737 stairs extend at terminals without loading bridges.*

Why Engines Under Wings?

Design Gives 737s Roominess, Workability

The jet engines tucked under the wings of Western's 737s give them an appearance in keeping with other jets in the company's fleet, but it is this design feature which makes them stand apart from the other twin engine short-range aircraft which are used by domestic airlines in the U.S.

Why did Boeing choose to put the 737's engines on the wings instead of on the fuselage under the tail, as was done for Boeing's own 727 and on other commercial twinjets?

Actually, the 737 engine placement represents an award-winning design. As with all Boeing aircraft, a number of configurations were studied before the 737 decisions were made.

Two separate teams of preliminary design engineers competed to find the most favorable location for the twinjet's engines. One concentrated on aft-mounted engine configurations, and the other team concentrated on wing-mounted configurations.

The investigations included a full series of wind tunnel tests for both designs. All relevant factors on performance, operations and maintenance were carefully evaluated.

Boeing admits frankly that the win-

ning decision was based primarily on economics.

While wanting to bring jet aircraft to shorter route segments and smaller cities, the airlines have faced a difficult economic problem. Such segments are marginally profitable at best and often unprofitable. To convince airline officials, Boeing needed an aircraft that could be operated profitably in these circumstances by means of a low cost per mile and a large passenger capacity.

It was found that this was most likely in an airplane of the 737's ultimate design.

The under-the-wing design allows for the unusually wide body of this smaller jet, and this, of course, makes room for more passengers. Any aft engine aircraft has an area between the side engines which cannot be used for carrying passengers. On the 727 this space was used for restrooms and for the large ventral stair compartment and its two side maintenance areas. The situation is more critical in a smaller two-engine aircraft because the relative size of the side engines is greater. With engines on the wing, passenger seats can be installed into the body tail cone until limited by the cone itself. Con-

sequently, about three more rows of seats could be carried in the same body length.

In Western's 737s, this valuable "extra" space is being used for three galley units which are spacious by aircraft standards.

An important result of this is passenger appeal. Stepping into the 737 cabin, today's Jet Age traveler should feel right at home—it's as wide as Western's other jet aircraft and has the same six abreast seating. It will hold 107 coach passengers; the 720B holds 104 passengers in its coach section.

Improved balance, access through front and back doors and weight saving also were major considerations in the choice of the 737 design. The total weight saved by under-the-wing placement approximated 1500 pounds, thus allowing for the added weight of a wide body, larger payloads and higher landing weights.

In addition, maintenance is aided by the 737's engine location making access attainable without the aid of a stand. The philosophy of "eye level" maintenance has been applied throughout the 737 to allow quick and convenient access on a tight turnaround schedule.

Dash-9 Adds 'Oomph' To Twinjet's Take-offs

The powerplants which the 737 wears under its wings are the new Pratt & Whitney JT8D-9s, a more powerful variety than the JT8D-7s which were originally planned for the 737s.

The Dash-9 engine has a power rating of 14,500 pounds of thrust, compared to 14,000 pounds of thrust for the Dash-7; it is this extra 500 pounds which makes the new aircraft more suitable for operation out of high-altitude airports.

In short, 500 pounds of thrust means extra "oomph" for take-off and climb. At Denver, for example, where the airport elevation is 5,331 feet, the Dash-9 will enable the 737 to take-off with 1,800 pounds greater payload than if it were powered by the Dash-7.

Western is the first airline to receive the 737 equipped with the Dash-9s.

The new engines each weigh 3,150

pounds and cost \$265,000.

The company's 720B engines weigh 4,200 pounds and cost \$267,000 each. Both are fan-type engines.

Two noticeable technical differences between the Dash-9 and the JT3D (on the 720B's) are visible: the Dash-9 doesn't have the characteristic "collar" that houses the giant fan section and expels a portion of the intake air near the front of the nacelle. In the Dash-9, the air stays inside the engine cowl and is expelled through the exhaust cone.

The second feature is that the Dash-9's thrust reverser (which creates the braking action after landing) is entirely in the tail cone section. In the 720B engines, part of the thrust reverser is in the "collar" near the front.

Having the entire thrust reverser unit in the rear of the engine increases maintenance efficiency.



KAREN WELLS

'Fun To Fly, Great Systems, Dream Galleys...'



C. V. CHRISTIANSEN

Perhaps only an airline employee would look at a \$3.4 million, 525 m.p.h. machine and coo "... isn't it cute?"

Undoubtedly the compact 737 brought this first-sight reaction from countless Western employees, but upon closer inspection, especially as they began training to work with it, this reaction turned to respect for the airplane and the big job it's designed to do.

"I think our passengers will find it a more convenient airplane," said Karen Wells, Los Angeles-based stewardess.

One of many Western employees who participated in the 737's interior design plans, Karen especially noted the closet space, a convenience feature for passengers who travel with garment bags, and the self-service water fountain just inside the aircraft's forward entry door.

Beaming like a boy with a new car, Capt. Ralph Baxter, WAL flight instructor, commented "this is the most fun to fly of any jet."

Baxter calls it a stable and amazingly responsive airplane. Like parking a car with power steering compared to one without, "the 737 does what you want, when you want it to in the approach, landing and take-off sequences."

From a servicing standpoint, C. V. Christiansen, maintenance instructor, singled out the easy accessibility to major systems as an important factor for reducing minor repair and major overhaul times.

"About 85 percent of the maintenance work is at eye-level," Christiansen noted. "The only thing a mechanic needs a ladder to reach is the auxiliary power unit (APU) in the tail."

The APU was called "one of the plane's best features" by Baxter. Designed to make the 737 completely self-sustaining, the unit provides air conditioning and electrical and compressed

air power for starting the aircraft anywhere. "We can go into alternate fields without any concern for having ground support equipment," he said.

Reduction in hydraulic systems and elimination of Freon packs for air conditioning and refrigeration were high points listed by all three.

The 737's air conditioning packs, located in the center of the fuselage between cargo pits, will operate on pneumatic air from the engines (and from the APU when the plane is on the ground), eliminating the need for Freon compressor units.

Likewise, the liquid nitrogen used in food and beverage refrigeration eliminates mechanical compressors. It requires only a solenoid valve to regulate the flow of liquid nitrogen and a switch to turn the system on.

Baxter noted that the 737's autopilot, which employs a new concept called "control wheel steering" takes much of the work load off flight crews.

The autopilot is designed to sense different air conditions and respond automatically thus making a smoother flight for passengers and requiring less attention from crew members.

While the 737 cockpit panels hold

106 instrument warning lights, only one — the fire warning — requires a pilot's immediate attention, Christiansen said.

Other warning lights simply indicate that a standby system has automatically taken over the job of the unit which has failed. No pilot corrections are needed.

The 737's landing gear also brought comments from Baxter and Christiansen. The seal around the main gear, under the center of the fuselage, eliminates heavy doors and the hydraulic systems necessary to open them.

Christiansen noted that the nose gear doors are of a fiberglass honeycomb construction, cutting down on weight and corrosion. In case of a malfunction, all landing gears can be lowered by three handles in the cockpit with no manual cranking required.

While the latest innovations in operational features highlighted maintenance and pilot reactions, Karen and other stewardesses pointed to galley and in-flight passenger service features.

Karen regards this as a "dream galley" with individual work areas for all three stewardesses and with one galley reserved for beverage services. The beverage galley includes 12- and 40-cup coffee makers along with refrigeration units. Ovens in the other two have fans which circulate warm air continually, keeping all hot foods at the same temperature.

"And there are safety locks on all galley doors that keep them from jarring open and spilling food during take-off," she said.

Another time-saving, passenger-pleasing feature, Karen believes, is that all passengers except one have pull-down tray tables right in front of them. There are no plug-in trays to remove before and after food and beverage services, and the passenger has a work table when he needs it.

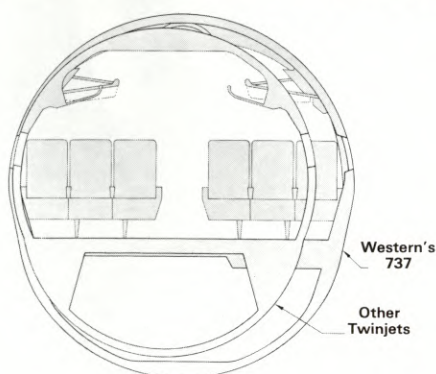


RALPH BAXTER

How Does It Compare?

MODELS	737-200	720B	707-300C
CRUISE SPEED (m.p.h.)	525	570	560
CRUISE ALTITUDE (feet)	25,000	31,000	33,000
MAXIMUM ALTITUDE (feet)	35,000	41,000	42,000
CRUISE RANGE (statute miles)	1,000	3,700	5,500
PASSENGER SEATING			
Coach	107	104	127
First Class	—	20	24
CARGO CAPACITY (cubic feet)	875	1,010	1,315
GALLEY UNITS	Three	Four	Four
LAVATORIES	Two	Four	Five
COAT CLOSETS	Two	One	Two
DIMENSIONS			
Wing Span	93'	130'10"	145'9"
Overall Length	100'	136'9"	152'11"
Height	37'	41'3"	42'5"
Fuselage Width	12'4"	12'4"	12'4"
Wing Sweepback	25 degrees	35 degrees	35 degrees
TAKEOFF WEIGHT (pounds)	103,200	229,000	326,000
ENGINES (Pratt & Whitney)	JT8D-9	JT3D-1	JT3D-3B
ENGINE THRUST (pounds)	14,500	17,000	18,000
COST (millions)	\$3.4	\$6.5	\$8.2

CROSS-SECTION COMPARISON



EXTRA ROOM — *Cross-section comparison of Boeing 737 with other manufacturer's twinjet shows extra cabin and lower deck roominess. Also note fuselage width (above) in comparison with bigger Boeing jets.*

Reprints Available

Souvenir copies of the photograph showing Western's 737 in flight (see Pages 6 and 7) can be obtained by contacting the company's Public Relations office at the address given at right.

Think Life's Too Hectic? Just Try This Up, Down, Turnaround Routine

Business traveler, are you feeling overworked and . . . tired of fitting appointments around flight schedules? Consider this itinerary for a three-day "business" trip:

First day, 7:35 a.m. — leave Los Angeles for Sacramento and on to Reno. Turnaround and go back to Sacramento, Los Angeles and on to Ontario. Go from Ontario to Los Angeles and then Oakland. From Oakland to Los Angeles, Ontario and Palm Springs. Leave Palm Springs, touch down in Ontario and go on to San Francisco. Turnaround and go back to Ontario, arriving at 9:52 p.m. to spend the night.

Second day, 8 a.m. — Two round trips between Ontario and San Francisco and another trip to San Francisco, arriving at 5:12 p.m. Go to Long Beach and San Diego, from San Diego to Las Vegas and back to San Diego. A day's work is completed by 9:51 p.m.

Third day, 7:20 a.m. — San Diego to Long Beach and San Francisco round-trip. A San Diego-Palm Springs-Las Vegas roundtrip then back to Long Beach and San Francisco. From San

Francisco to Ontario and back home to Los Angeles by 8:10 p.m.

After covering eight cities and a total of 7,614 miles in three days, the traveler, a WAL 737, can look forward to (. . . what else?) starting the whole pattern again . . .

It's typical of the kind of traveling required to do the 737's job — that is, putting big jet services into short haul markets.

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FLIGHT TIMES

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