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SKYMASTER

THE DOUGLAS DC-4/C-54/R5D

By R.E. Williams Managing Editor AAHS Journal

(All photos courtesy McDonnell Douglas via Harry Gann or author)

Contributions to the development of world aviation by Donald W. Douglas and the Douglas Aircraft Company are legion. His DC-3 gave wings to the world in the 1930s and the DC-4 gave them global range. The four-engine Douglas DC-4 was the first modern airliner to make transoceanic air travel an everyday occurrence.

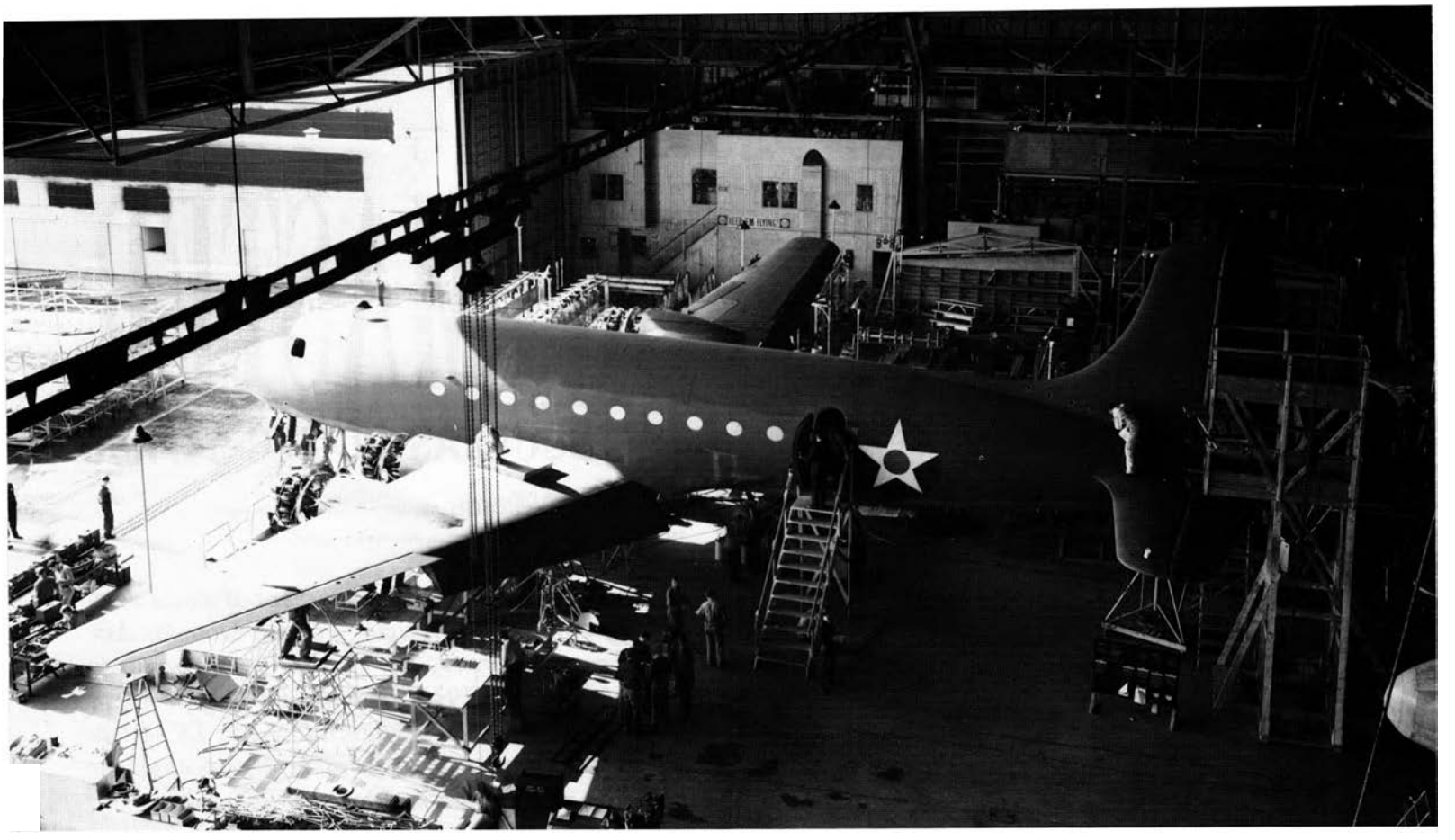
THE DC-4E, DEVELOPED AS A JOINT VENTURE BY DOUGlas, United Air Lines, American Airlines, Eastern, TWA, and Pan American, proved to be unsatisfactory. It proved to be too ambitious a project, ahead of its time technically. And by general agreement of its sponsoring consortium the program was abandoned in favor of developing a smaller, less sophisticated airliner.

Thus in the summer of 1939 the Douglas engineering team led by Arthur E. Raymond and Ed Burton began work on the new design. To avoid confusion the new design was designated DC-4 and the old one DC-4E (experimental). The DC-5 was then already flying.

Economy of operation, ease of maintenance and safety were features guiding the development of the DC-4. The tricycle landing gear of the DC-4E was retained though modified considerably. The main gear, with dual wheels, retracted forward into the inboard engine nacelles instead of laterally into wing wells, as in the DC-4E. The dual wheels provided greater tire safety and better weight distribution on runways and parking areas.

The new fuselage design was 10 inches smaller in diameter than the DC-4E, with seating for 40 passengers in 10 rows of two seats on each side of a center aisle. Consideration was given for a 28-passenger sleeper version similar to the DC-4E arrangement, though none were produced. The unpressurized round fuselage had a constant section for most of its length, presenting uniform seating modules and excellent growth potential. The fuselage could be easily stretched (as in

The Air Transport Command, which was larger than all the world's airlines before the war, flew C-54s throughout the free world. Seen In flight is one of the ATC C-54BS.



the later DC-6 and DC-7 series) by adding fuselage sections fore and aft of the wing.

A single vertical fin and rudder, which became a traditional Douglas shape seen on many later designs, replaced the unusual three-fin arrangement of the DC-4E.

The DC-4 wing design was considerably smaller than on the DC-4E, but the higher aspect wing was more efficient. And the traditional swept leading edge and straight trailing edge of the earlier DC models was changed to a constant taper on both leading and trailing edges. The three-piece wing construction featured a three-spar center section incorporating the engine nacelles, main landing gear and integral fuel tanks, with single-spar outer panels.

The DC-4 was initially powered by four Pratt & Whitney *Twin Wasp* R-2000-2SD1-G 14-cylinder radial engines developing 1,450 horsepower each. An alternate engine offered to the airlines was the 1,000-horsepower Wright SGR-1820 nine-cylinder radial, but was never installed by Douglas.

After evaluating the new design in 1940, United Air Lines and American Airlines placed an order for 24 production DC-4s. (No prototype was built.) The war in Europe was a year old when Douglas started DC-4 production.

When Pearl Harbor was attacked on December 7, 1941, drawing the U.S. into the war, nine of the first 24 DC-4s were in various stages of production. The War Department instructed Douglas to cease work on the DC-4 and concentrate on the design and production of combat aircraft and the DC-3. However, Donald Douglas, after committing so much time and money in creating the DC-4, did not give up easily. He convinced the War Department that proceeding with the DC-4 would in no way affect delivery schedules on military contracts.

His tenacity at continuing DC-4 production despite objections from the War Department was to their advantage, for it gave the U.S. military forces their first intercontinental transport fully operational, without the normal development cost or lead time—and when it was most needed.

Before the first DC-4 was completed the U.S. Army Air Corps (USAAC) commandeered the entire DC-4 production into military service as C-54s. The first C-54 (41-20137) was completed in February 1942 with military markings. First flight was at Clover Field, Santa Monica, on February 14 with Carl Cover in control.

Its maiden flight and flight test program were so trouble-free that delivery to the USAAC was made four months later on July 26, 1942.

The first 24 C-54 transports were completed to the original commercial specifications with very few changes. However, the 2,012-gallon fuel capacity of the DC-4 was increased to 3,580 gallons by the installation of four auxiliary fuel tanks in the main cabin.

Chicago C-54 Production—U.S. military requirements for heavy transport aircraft increased rapidly following our entry into World War II prompting many follow-on orders for C-54s. In need of additional production space a new factory was opened at Park Ridge, Illinois, near Chicago. The first C-54 built at this new facility (42-72166) was delivered to the USAAF on October 1, 1943. Nearly two-thirds of all C-54s were produced at this facility.

C-54 production increased rapidly after the Chicago factory

The first DC-4 was nearing completion on January 1, 1942. By then it was called a C-54 (41-20137) with olive drab finish and military markings.

A wartime view of the Douglas C-54 assembly line in Park Ridge, Illinois, near Chicago where nearly two thirds of all C-54s were produced.

A Chicago-built C-54 seen in flight over downtown Chicago. The photo had been retouched to delete military markings, no doubt a wartime security measure.

A Douglas C-54 (42-32936), the first production C-54, was photographed in flight in 1942.

The VC-54C "Sacred Cow" was specially modified for U.S. president Franklin D. Roosevelt with a sumptuous interior and an elevator in the lower aft fuselage to accommodate the president's wheelchair.

opened. Only 24 C-54s were delivered in 1942 and 74 in 1943 but jumped dramatically to 354 in 1944, and 710 in 1945. And, following contract cancellations after VJ-Day, only one was delivered in 1946.

C-54A—Total C-54 production reached 1,242 aircraft in several variations. The C-54A, the first military version of the DC-4, was built to carry 50 troops or 32,500 pounds of cargo. It had a reinforced floor, a large cargo door in the left rear fuselage and built-in twin boom cargo-loading hoist. Gross weight increased to 73,000 pounds. Ninety-seven were built in Santa Monica and 155 in Chicago for a total of 252, of which 56 were assigned to the Navy with the designation R5D-1.

C-54B—Similar to the C-54A except for integral fuel tanks in the outer wing panels and a fuel capacity of 3,740 gallons, the C-54B production totaled 220. One hundred were built in Santa Monica and 120 in Chicago. The U.S. Navy received 30 as R5D-2s, and one went to Great Britain for use by Winston Churchill.

VC-54C—The single VC-54C "Sacred Cow" was a C-54A (42-107451) specially modified for President Roosevelt with an electric elevator for the president's wheelchair. It featured a stateroom, three conference rooms and accommodation for the president and a staff of 14 plus a crew of seven. Fuel capacity was increased to 4,510 gallons by integral fuel tanks in the outer wing panels.

C-54D—The C-54D was produced in the largest numbers. It was similar to the C-54B with the same 3,740-gallon fuel arrangement but powered by 1,350-horsepower R-2000-11 engines. All 380 C-54D *Skymasters were* built in Chicago, with 86 going to the Navy as R5D-3s.

Many C-54Ds were later modified for special missions. A few, fitted with special electronic equipment to monitor airways, were redesignated AC-54Ds; nine were modified for missile nose-cone recovery and became JC-54Ds. Another 38 became SC-54Ds when modified by Convair for MATS Air Rescue Service (later redesignated HC-54D). Trainer versions became TC-54Ds, and VC-54Ds were modified as staff transports.

C-54E—Santa Monica-built C-54Es were designed to be rapidly convertible, carrying 32,500 pounds of cargo, 50 troops in canvas bucket seats or 44 passengers in airline-type seats. The cabin fuel tanks were replaced by collapsible rubber fuel cells in the center wing panel. Of the 125 C-54Es produced, 20 were assigned to the Navy as R5D-4s.

C-54F—One XC-54F was a Chicago-built C-54B modified in Oklahoma City with two paratroop jump doors, for use by

Troop Carrier Command. Production would have used C-54D airframes but no others were built.

C-54G—Primarily troop carriers, the C-54Gs were C-54Es with P&W R-2000-9 engines. One hundred sixty-two were built, all in Santa Monica, of which 13, as R5D-5s, were delivered to the U.S. Navy. C-54GMs were Rolls-Royce powered DC-4 derivatives built in Canada under license by Canadair. More about these later.

Other versions of the C-54 planned for special jobs but did not go into production are mentioned as part of the overall picture. Neither the C-54H paratroop transport nor the C-54J staff transport got past the planning stage, but a single XC-54K was a C-54E fitted with Wright R-1820-HD engines. And the single C-54L was a C-54A modified to test a new fuel system.

C-54M—The C-54M designation applied to 38 C-54E *Skymasters* stripped to carry coal during the Berlin Airlift, with payload increased to 35,000 pounds. And the 30 MC-54Ms were C-54E conversions for aeromedical evacuation during the Korean war, with 30 stretchers and accommodation for medical attendants.

The last of 1,242 C-54 *Skymasters* (45-636) was delivered to the USAAF on January 22, 1946.

C-54 Operation—Following its introduction into service with the USAAC on July 26, 1942, the Air Transport Command (ATC) began building a network of air routes linking our worldwide bases of operation. The superior range of the C-54 made flights over the North Atlantic and South Atlantic, Pacific and Indian Oceans, as well as across Africa and the Himalayas a daily routine.

The scope of the ATC and the dependable efficiency of the C-54 were brought into focus by foreign correspondent John Gunther, in a 1944 article describing his transatlantic flight from New York to Africa. Of the ATC he said:

"Little by little I began to learn something about the Air Transport Command. The ATC is the division of the Army Air Forces which flies planes and human beings from the United States to every battlefront, from New York and San Francisco and Miami to the extreme ends of the earth. We have, I believe, garrisons or task forces at not less than 70 outposts scattered throughout the world. The ATC not only serves them all; it is the indispensable and in some cases the only link between those outposts and home. As such, it is incomparably the largest and at the same time the most costly articulated aerial transportation system in existence.

"Its total routes amount to more than 10 times those of all airlines of the world combined before the war. — It flies an average of 3,000,000 miles per day and in one season it carted more than 50,000 people across the Atlantic Ocean without losing a single person or ship."

In praise of the C-54 he said:

"Only after breakfast (at Gander, Newfoundland) did I begin to realize how remarkable all this was. Here I was in tropical uniform, half freezing in Newfoundland on the way to Africa. Yet the most remarkable thing about the whole flight was, in a way, that it was so unremarkable. The most extraordinary thing about it was that it was so ordinary."

The airlift from Burma and India into China during WWII was the largest and most successful single air transport operation in the history of the U.S. Army Air Force. Flying over the Himalayas, the highest mountain range on earth, to supply Chung Kai-shek's forces from India began in February 1942. The newly formed 10th Air Force started with a handful of C-47s, but grew rapidly into a force of over 600 aircraft and 25,000 personnel by the end of the war.

The C-54 started flying the "Hump" in 1944. Its greater range permitted direct flights from India to China making it a great asset to the operation.

This C-54G of MATS Continental Division had been in operation over 10 years when this photo was taken.

A C-54G with natural aluminum finish is seen in flight off the Southern California coast.

A U.S. Navy R5D-3 (C-54D) *Skymaster* was one of three Douglas transports to land at the South Pole during the Geophysical year in 1956—the year your AAHS Society was formed.

A Chicago-built R5D-3, one of the last of 86 C-54Ds assigned to the Navy, was photographed prior to delivery.

Seen at Los Alamitos Naval Air Station with white upper and medium grey lower fuselage is a U.S. Navy R5D-2 (C-54B) BuNo 50868.

However, maintenance of the C-54 in the China-Burma-India (CBI) theater was initially a problem, contributing to low aircraft utilization. Service facilities were scattered and personnel were inexperienced in maintenance of large aircraft.

General William Tunner, when he became commander of operations, introduced the Production Line Maintenance (PLM) system. Aircraft moved down a Detroit-type production line staffed by different systems specialists at each station performing one specific service. The PLM system worked so well that soon aircraft utilization in the CBI reached an all-time high. The C-54 reached 11.65 hours per day in July 1945 when the Division had 132 *Skymasters* in operation. Over 70,000 tons of supplies were airlifted into China that month alone.

R5D Operation—The U.S. Navy and Marine Corps had over 200 R5Ds in service during WWII. The five main versions were the same as their USAAF counterparts and performing similar duties. Many were still in service more than 20 years later.

The R5D *Skymasters of* the Naval Air Transport Service (NATS), Pacific operated airlines stretching more than 75,000 miles over the vast Pacific Ocean from San Francisco to Honolulu to the Marshalls and the Gilberts, to Guadalcanal,

General Eisenhower's personal C-54 *Skymaster* is seen under the camouflage netting at the Douglas Santa Monica factory.

Immediately following WWII the Douglas conversion facility was quite busy as airlines of the world anxiously awaited their "new" converted DC-4s.

The United Air Lines DC-4 *Mainliner* here was a converted C-54B, still bearing its military serial number 44-9025.

the Admiralties, New Guinea, Australia, New Caledonia, New Zealand and the Philippines.

Operating R5D *Skymasters,* NATS was the equivalent, in miles flown and passengers and cargo carried, of the entire U.S. domestic airline system before the war.

In one month (May 1944) NATS, Pacific flew more than two million miles—more than 80 times around the world at the equator, averaging more than a million miles per month for 15 months—and all over water! And in 15 months of operation, NATS, Pacific never lost a ship, or even injured a passenger or crew member on a scheduled flight. That remarkable safety record is a great testimony to the quality of the NATS operation and to the safety and dependability built into the Douglas R5D *Skymaster.*

The Naval Air Transport Service continued to operate as a separate organization until June 1, 1948, when it was merged with the USAF Air Transport Command to form the tri-service Military Air Transport Service under the command and direction of the United States Air Force.

C-54s in VIP Service—C-54 *Skymasters* served as personal transports for several world figures during and after World War II. The most notable was the VC-54C (42-107451) used in the continental U.S. by President Franklin D. Roosevelt, named the "Sacred Cow." The *Sacred Cow* was used extensively by the White House staff. It was flown to the Yalta conference in the winter of 1944-45, though F.D.R. was not aboard, and was used extensively on worldwide missions by Harry Truman. Both Winston Churchill and Charles DeGaulle were assigned personal C-54s, and both generals MacArthur and Eisenhower had personal *Skymasters.* General MacArthur's C-54 was named appropriately the *Bataan.*

The U.S. Army and Navy had over 1,000 C-54s in service in all theaters by September 1945 when the war ended. *Skymasters* of ATS and NATS built a wartime reputation for safety and reliability, completing 79,642 transoceanic flights with only two ditchings and only one with loss of life.

C-54s in Foreign Service—In addition to the U.S. Armed Forces, Douglas *Skymasters* served in the RAF during the last year of World War II. One C-54B (43-17126) was delivered to the British in the fall of 1944. Assigned the RAF serial EW999, the *Skymaster* was operated by the VIP Flight of No. 246 Squadron for the Prime Minister, Winston Churchill. Twenty-two C-54Ds were to be delivered to the RAF beginning in February 1945 with serials KL977 to KL986, and

KL988 to KL999. But only the first 10 were delivered and, being Lend-Lease aircraft, they were returned to the U.S. after VJ-Day.

Eventually C-54s and DC-4s were operated by the armed forces of at least 15 nations besides the U.S., France and Great Britain. In 1971 some of these aircraft were still flown by the air forces of 14 countries.

C-54s/DC-4s in Postwar Service—With the coming of peace hundreds of C-54s were declared surplus and many were sold, forming the nucleus of equipment urgently needed by U.S. domestic and overseas airlines, and airlines of other countries. The first surplus C-54s went to American Airlines and United Air Lines, the original DC-4 customers.

Overhaul and modification centers were kept busy transforming the spartan C-54s into plush commercial airliners. Douglas was deeply involved in this lucrative activity during their period of transition to peacetime aircraft manufacture, with conversion lines set up at Santa Monica and El Segundo.

American Airlines began DC-4 service on their New York-Chicago route in February 1946, and United and Eastern began soon after. American reopened its transcontinental service between New York and Los Angeles on March 7, 1946, with only one stop compared to three for the DC-3, cutting nearly four hours off the one-way time.

Other U.S. domestic carriers flying the DC-4 in the United States included Northwest, Northeast, National, Pan Am, Capital, Delta, Chicago and Southern, TWA and Western.

Transatlantic commercial flights were inaugurated on October 23, 1946, by American Overseas Airline with a converted C-54. It flew between New York and London, with stops at Gander and Shannon, in 23 hours and 48 minutes. Soon after, Pan American, KLM, Air France, SAS, Sabena

and Swissair started their North Atlantic flights with DC-4 *Skymasters.*

Transpacific routes with DC-4s were also initiated in 1946, by Pan Am and Australian National Airways which flew between Sydney and Vancouver, British Columbia.

Flota Aerea Merchante Argentina started flights with DC-4s between South America and Europe. And following a trial flight on November 10, 1946, KLM and KNILM reopened their prewar route between the Netherlands and the East Indies.

Postwar DC-4 Models—Anticipating a big demand for new DC-4s in the immediate postwar period, Douglas was ready with two new designs, the DC-4-1009 and DC-4-1037. The DC-4-1009 with many refinements was offered with accommodation for 44 day-passengers and crew of five, or for 22 passengers as a sleeper transport. The DC-4-1037 was a cargo transport with the large C-54 cargo door. Both models were to have 1,450-horsepower Pratt & Whitney R-2000 radial engines and a normal fuel capacity of 2,868 gallons, which could be increased to 3,592 gallons.

The advertised rapid delivery of the new DC-4s was possible because of the large stock of partially completed airframes and parts left over when C-54 contracts were canceled after VJ-Day. The first of 79 DC-4-1009 *Skymasters* built (NC1021) was delivered to Western Air Lines on January 18, 1946. DC-4 production ceased when the last DC-4-1009 (ZS-BMH) was delivered to South African Airways on August 9, 1947. No DC-4-1037 cargo transports were built, which is understandable considering the large number of surplus C-54s available at bargain prices.

The career of the DC-4 on major commercial airline routes was relatively short-lived. Larger, pressurized aircraft like the DC-6 and the Lockheed *Constellation* gradually replaced it. And, like the DC-3, the *Sky master* was relegated to secondary routes and cargo operations, and to emerging countries. Other DC-4s are still flying with nonscheduled airlines.

DC-4MC Merlin-Powered—In 1944 Canadair was formed in Montreal to build a pressurized, Rolls-Royce Merlin-powered version of the DC-4 under license from Douglas. Initial customers were Trans-Canada Airlines (TCA) and the Royal Canadian Air Force (RCAF). A Douglas-built C-54G fuselage and other components were utilized for the prototype. It was powered with four 1,725-horsepower *Merlin* 620 liquid-cooled engines with annular radiators.

Designated DC-4M-X *(Merlin*-powered experimental) it made its first flight at Cartierville in July 1946, piloted by Bob Brush of Douglas and Al Lilly of Canadair.

Seventy-one Canadair-built DC-4MCs were produced for four customers, the RCAF, TCA, BOAC and PCA. Some, but not all, had pressurized cabins. And 70 had Rolls-Royce *Merlin* engines, but the last one, produced in 1950, was a pressurized VIP transport for the RCAF with 2,100-horsepower Pratt & Whitney air-cooled radial engines.

The RCAF DC-4MCs, called *North Stars,* were operated extensively on domestic and long overwater flights to Korea and Europe. *North Stars* saw service with the RCAF from April 1948 to October 1966 when the last one was retired.

Merlin-powered DC-4MCs, with a gross weight of 79,600 pounds, cruised 60 to 80 miles per hour faster than the DC-4 but were much noisier. TCA developed a crossover exhaust system for their aircraft which helped reduce cabin noise. TCA flew to Europe, the United States, Bermuda and trans-

TWA operated DC-4s on both passenger and all-cargo routes. Seen here Is an ex-C-54, now a TWA *Sky Freighter.*

American Airlines began DC-4 transcontinental service between New York and Los Angeles on March 7, 1946, with only one stop.

Japan Air Lines, among the international carriers, used the DC-4 in their postwar route expansion.

The newly converted *Flying Dutchman* on its way to join the KLM fleet in May 1946. KLM started transatlantic service later in the year.

continental Canadian routes till June 1961.

BOAC operated its C-4s (DC-4MCs with mostly British equipment) on its London-Pakistan-India-Far East route, and later to the Middle East. Their C-4s were removed from service in April 1960.

Canadian Pacific flew their DC-4MCs throughout Canada, and on overwater routes to New Zealand and Australia, Tokyo and Hong Kong. Passenger accommodations in CPA aircraft varied from 40 first-class passengers to 62 economy-class. After being replaced by *Super Constellations* they were operated as freighters in Canada until August 1961.

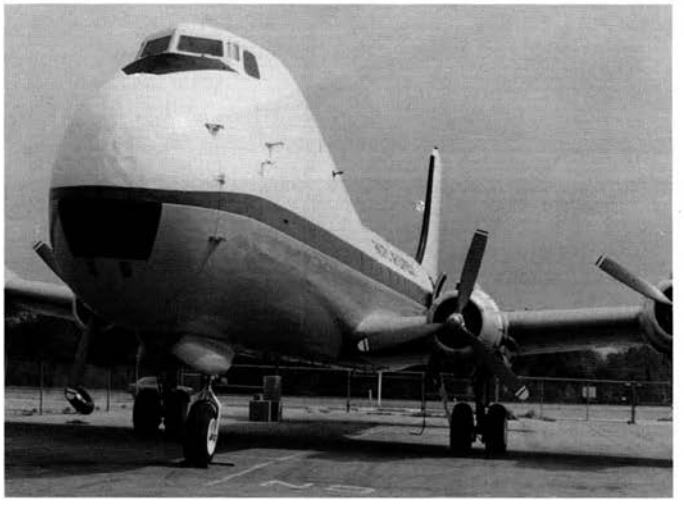
All Canadian DC-4MCs including those of the RCAF, TCA, CPA and BOAC eventually passed on to numerous smaller operators. By the end of 1975 all but one were out of service.

C-54 in Postwar Operation—In the immediate postwar period C-54 *Skymasters were* used in a number of unusual experiments. In September 1947 a C-54D (42-72461) of the All Weather Flying Center was flown from Stephensville, Newfoundland, to Brize Norton, England, completely by electronic equipment with no direct pilot assist. All functions from engine start and taxi, to engine shutdown in England, including all flight controlling, were performed electronically. A year later another C-54D (42-72734) flew nonstop from Fairbanks, Alaska, to Oslo, Norway, via the North Pole, a distance of 6,200 miles, in 22 hours. Yet another C-54D was fitted with Goodyear-built cross-wind landing gear by the Wright Air Development Center as part of a program to increase flying safety under adverse weather conditions. It was the first large aircraft to be so equipped.

Immediately after the war the ATC pioneered its weekly global flight schedule with C-54 *Skymasters.* Flying east from Washington's National Airport on September 28, 1945, and returning there from the west on October 4, the globe-girdling team on the first flight covered 23,279 miles in 116 hours and 23 minutes flight time.

The Berlin Airlift—Though large numbers of surplus C-54s were sold to the airlines following the close of WWII, several hundred were retained for future emergencies. The first opportunity came two years later in the form of the Berlin Airlift. When the Russians blockaded Berlin by land in June 1948, C-54s flown by the newly formed MATS played a vital role in supplying essentials to the two million Berliners cut off from the rest of the world.

American, British and French elements joined in the airlift



The DC-4MC was built under license by the Canadian company, Canadair. The normal 135-hp Pratt & Whitney R-2000 engines were replaced with 1725-hp Rolls-Royce *Merlin* 620 engines. The above photos are of the prototype *North Star* (CF-TEN, Canadair c/n 101) built for the RCAF. The airframe was nearly identical to the C-54G-DO.

One of the remaining DC-4 Carvairs, the brainchild of Freddie Laker, was photographed by the author at the Long Beach, California airport on its way to Pacific Air Express in Honolulu, 3-11-83.

operation which flew in more than two million tons of supplies between June 16, 1948, and September 30, 1949, when operations ceased. Most of the delivery flights were made by C-47 and C-54 aircraft, with 336 *Skymasters* committed during peak operations. The overall operation was a huge success and the blockade was lifted in the spring of 1949, winning an allied victory over Communism by peaceful means.

Korean Service—Shortly after the Berlin Blockade was lifted, trouble flared up in the small country of Korea. Divided at the 38th parallel with Communists controlling North Korea and a democratic South Korea, an uneasy truce existed. War finally erupted on June 25, 1950, when the aggressive North Koreans invaded the South, no doubt to test America's willingness to defend a small ally so far away. In this they made a grave tactical error.

Attacking in full force under cover of bad weather, the South was caught off guard. The first casualty was a MATS C-54 caught on the ground at Kimpo Airfield near Seoul. It was strafed and destroyed by Yak fighters during the first surprise raid. Meanwhile, working around the clock, C-54s of the 374th Troop Carrier Group evacuated 871 American Nationals from South Korea in two days. Soon, United Nations forces moved in on the side of South Korea.

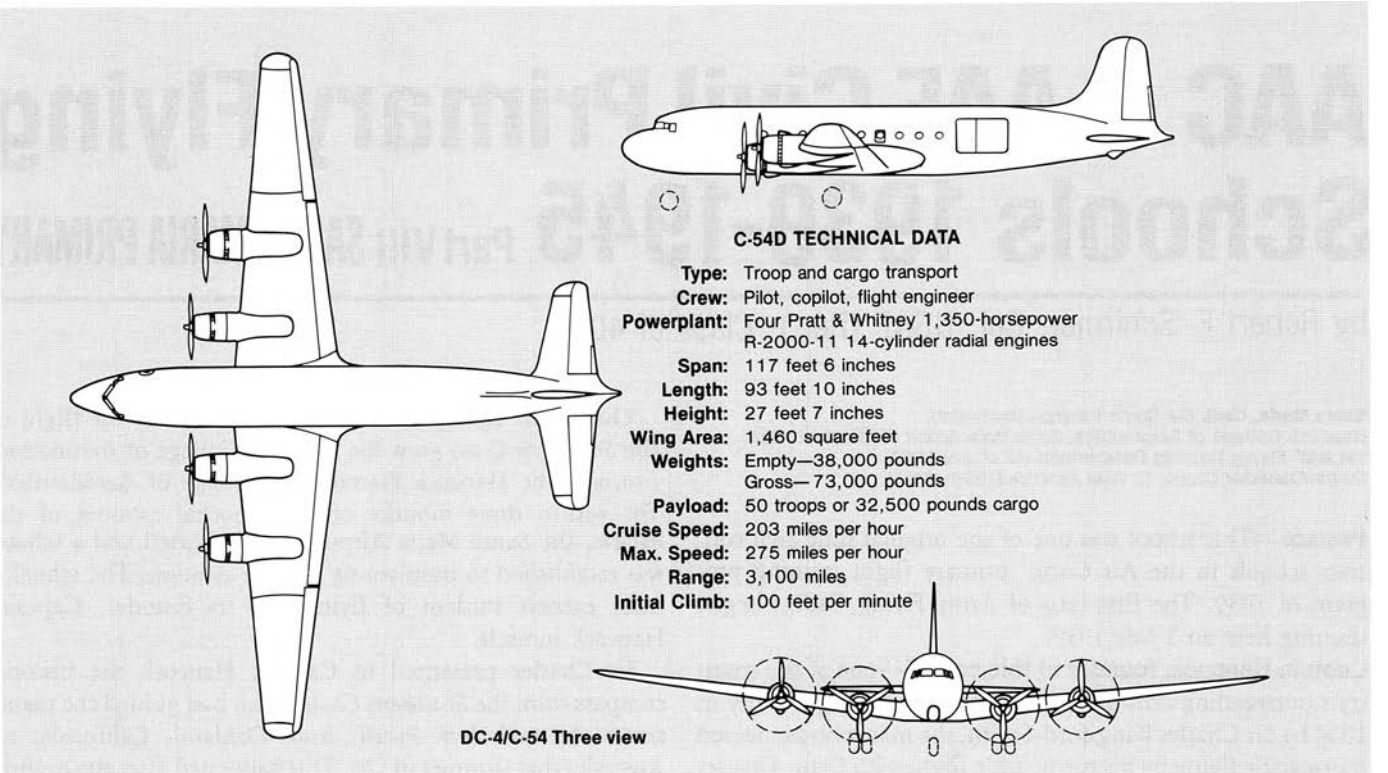
Skymasters provided logistic support for the U.N. forces, flying in military personnel and equipment, and performing aeromedical evacuations with 30 MC-54s converted from C-54Es.

C-54 and R5D *Skymasters* were the prime-movers of men and materiel during the two-year war, gradually being replaced by Douglas C-124 *Globemaster* IIs as they became operational.

Civilian airlines also played a part in logistic support of the Korean War flying *Skymasters.* Northwest Airlines, because of its experience with DC-4s in the Pacific, became a prime contractor early in the conflict. By the end of the war Northwest completed 1,380 airlift round-trip Pacific crossings, a total of 13 million miles. It carried 40,000 troops and 12 million pounds of high-priority military cargo across the Pacific.

DC-4 Carvair—After being phased out of service by the major airlines, DC-4s found their way into many parts of the aviation world community, some being modified for specialized jobs. The most unusual modification produced the DC-4 *Carvair*.

In 1959, Channel Air Bridge in England needed a new



vehicle-ferry aircraft to replace the Bristol *Superfreighter* for operations between England and continental Europe. Because the highly specialized service required only a few aircraft, a new design was out of the question. Freddie Laker, then managing director of Air Charter, Channel Air Bridge and Aviation Traders, believed that conversion of the DC-4 was the only logical solution. Used DC-4s were then plentiful and reasonable for around $100,000 each.

Aviation Traders, working with Douglas engineers, designed an unusual and efficient modification. The forward fuselage was extended nearly nine feet, with a hydraulically operated swing-nose hinged on the left, and the cockpit raised nearly seven feet above the long tubular fuselage. The nosewheel retracted into an external blister and the vertical empennage was enlarged considerably. The cabin floor was lengthened from the original 50 feet to 80 feet, carrying five cars, plus 23 passengers in a rear cabin.

The prototype *Carvair* made its first flight at Southend, England, on June 21, 1961. And, despite an accident in which a forklift nearly severed its aft fuselage, it was certificated on January 31, 1962, and went into service on Channel Air Bridge's Southen-Rotterdam route on March 1.

Between 1962 and 1968 a total of 21 DC-4 *Carvair* conversions were delivered by Aviation Traders, and were operated in at least 10 countries. However, by 1975 only a few were still in service.

On March 11, 1982, one of two *Carvairs* owned by Jim Blumthal of Sky Master Aviation in Tucson, Arizona, was seen and examined by the author at the Long Beach Airport. With the registration N80FA and named "Plain Jane," it was on a delivery flight to Pacific Air Express in Honolulu. At that date only five other *Carvairs* remained in service, two in New Zealand, one in Alaska, one in Northern California and one in Tucson.

The DC-4 was the first four-engine modern airliner to make transoceanic flying routine while upholding the Douglas tradition of safety and dependability. And like its venerable ancestors, the Cloudster, the World Cruiser and the DC-3 (to name a few), contributed greatly to world aviation progress, and has earned a revered place in aviation history. □

SKYMASTER PRODUCTION

C-54	Original DC-4s	20
C-54A		255
C-54B		220
VC-54C	C-54A modified	(1)
C-54D		380
C-54E		125
C-54F	C-54B modified	(1)
C-54G		162
C-54H		0
C-54J		0
XC-54K	C-54E modified	(1)
C-54L	C-54A modified	(1)
C-54M	C-54E modified	(38)
MC-54M	C-54E modified	(30)
DC-4-1009		79
Total		1242
DC-4MC	Canadair	71
Total		1313

ABOUT THE AUTHOR

R.E. (Bob) Williams was born in a small Indiana town sometime after the airplane became an accepted fact. He grew up with *Air Trails,* Tailspin Tommy and Smiling Jack to whet his interest in aviation; there were no airports around. After serving in WWII he completed his education in Dayton, Ohio, and worked five years in Graphic Communication at Wright-Patterson AFB, followed by 30 years at Douglas Aircraft Company in Long Beach, California. At Douglas he authored a series of aviation history articles entitled *Yesteryear* published by Douglas, and internationally by *Koku Fan* magazine. The Douglas DC-4/C-54 *Skymaster,* his third article for the AAHS *Journal,* was developed from two *Yesteryear* stories.