

THE MARTINS OF TWA

1950-1951

by Ed Betts

A NOTE BY THE AUTHOR: *Before continuing with the Martin story I'd like to make an explanation of what is to follow. About 200 pilots and former members of the TWA engineering, overhaul and maintenance departments helped me with the input by letters, tapes and phone calls. After about 40 years since these events took place, many confessed to a hazy recollection as to an exact date (many logbooks are buried deep in an attic or have been disposed of) so this probably will not be in chronological order. It will be an estimate on my part as to where this fits in with the Martin story. Also, quite a number of the pilots almost apologized that they could not help with the input or stories; they spent hundreds, or thousands, of hours flying the Martins with a routine operation. With a few exceptions, the consensus was that the M404 (not necessarily the 202A) with the P&W R2800CB-16 engine was a great airplane to fly, a challenge and lots of fun (when everything was working according to the Flight Operations Manual). All of immediate post-WWII commercial aircraft or engines had many initial "bugs"; the Martins, in the early stages, had more than their share. (Ed Betts)*

TWA'S CHOICE OF A TWIN-ENGINE AIRCRAFT TO REPLACE the DC-3 for short-haul flights had narrowed down to the Martin or Convair. Martin had proposed a larger version of their Model 202 (40 passengers) which would be pressurized. Convair already had their Model 240 in production. Both airplanes used the new P&W R2800 engines which were rated (wet) at 2,400 hp. Howard Hughes requested a series of competitive demonstration flights between the two companies and the results were to be a secret between the three parties involved. A Model 202 Martin, similar to one currently in use by NWA, but with modifications, was used to simulate the Model 404. A major modification was a new step splice, or joint, which connected the two outer wing panels to the center or main spar.

An NWA 202 crashed on 8-29-48, in a thunderstorm or turbulent conditions, when an outer wing panel broke at this joint. Investigation found several of NWA's 202s had evidence of metal fatigue or minute cracks in this critical area. The immediate fix was a modified and beefed-up joint, but the stigma had already been created that the Martin was a "jinxed" airplane. TWA's engineers, headed by Bob Rummel, were satisfied the new joint would be as safe as any airframe currently designed. The Convair outperformed the Martin in many categories, such as speed with the same power and weight, but the Martin was far superior with the single-engine flight performance on takeoff (at 44,900 pounds). It also had a lower stall speed (or warning of same) in all configurations of flaps and gear. TWA considered this important for operating in or out of airports with short runways. An agreement was signed on 2-22-50 for the purchase of 30 aircraft. Eastern, at the same

time, ordered 60. Howard Hughes ordered one and the U.S. Coast Guard two (in 8-51 TWA increased its order to 40, bringing the total orders to 103, which was the break-even number for Martin to possibly make a profit). Pending delivery of TWA's order, a separate agreement was made for Martin to build and lease to TWA (with an option to buy) 12 of the modified 202 (36-passenger) version, dubbed the 202A. This model did not require a new CAA Type Certificate and deliveries of all 12 were promised within a few months. It was not pressurized.

The CB-16 engine was brand new to the industry when they went on the TWA M202A. This engine had a new type of forged cylinder head, a 3" wider impeller which gave it much better altitude performance than its predecessors. The Martin engine cooling was far superior to that of the later model Convair 340, which resulted in lower cylinder head temperatures and better altitude performance than the same engine on the Convair. Also, with the introduction of the low-tension ignition system there were fewer problems with a rough engine.

Two weeks after the agreements were made another NWA 202 suffered a fatal crash on 3-7-50 while making an approach to MSP. It was at night with a 900' ceiling and visibility ½ to ¾ with fog and blowing snow. The wind was down the runway at 27 mph with gusts to 40. What was known about the accident was that the plane was 128' below the ILS glide path and 650' left of the localizer when it struck a well-lighted flagpole, tried to go around and about 3.8 miles from the field the left wing





The Martin 202A, 404, Martinliners, used R2800-CB engines, using water injection and autofeathering for takeoff. The 202 grossed at 43,000 pounds, the 404 at 44,900, lengths 71 feet 7 inches and 74 feet 7 inches, wingspans 93 feet, 3 inches. (TWA photo from the Edward G. Betts Collection)

TWA Martin 202A, N93201. (TWA Photo from the Edward G. Betts Collection)

panel separated. The subsequent CAB investigation found no fault with the airplane's structural integrity, particularly in the area of the joint (the flagpole hit the wing outboard of this area). The NWA pilots did not agree with the "probable cause" (pilot error). As far as the veteran passenger knew, from what he read in the papers, a wing had fallen off another NWA Martin 202, and he chose to fly in a DC-3 (or other aircraft) or take the train.

TWA's (Howard Hughes) choice of the Martin created a great deal of apprehension among the junior pilots who would be flying the airplane in spite of assurances that all of the structural problems were corrected. TWA's engineers submitted their specifications, which included numerous improvements over the 202. Jack LeClaire, who had an engineering background, worked on the cockpit specifications which included instrument locations and lighting arrangements.

As work progressed at the factory, Don Crowley and Mark Antes, from the ground school training, attended NWA's 202 classes and then were briefed by Martin at the Baltimore plant on the 202A differences. A team of maintenance instructors, headed by John McNelley, were checked out by Martin and P&W. Bert Cooper was in charge of Flight Training. Starting 7-25-50, and continuing through 3-1-51, a series of "Martin

Grams" (bulletins) were periodically issued to the pilots and certain ground personnel describing the aircraft, engines and other pertinent information. Deliveries were ahead of schedule and TWA accepted the first plane on 7-14-50. Jack LeClaire made the acceptance tests. It was delivered to MKC by Bert Cooper and Martin Chief Test Pilot, Pat Tibbs. The plane was unpainted except for TWA's usual red stripes and the logo of that circa. The delivery schedule was now four aircraft in July, four in August and four in September.

TWA announced that scheduled flights would begin on 9-1-50. In the interim the "Buddy Club" (Flight Instructors) were checked out which included (alphabetically): Dick Colburn, Joe Imeson, Fritz Jenkins, Al Knudsen, Andy Lundin, Max Parkinson, Gale Storck, Roy Thrush, Busch Voights and Bronson White. There were some pretty senior supervisor pilots (MKC-based) giving line time, such as Earl Fleet, Howard Hall and Les Munger. The course was one week of ground school and eight hours of transition (three landings for a copilot) followed by 30 hours' line time with a supervisor.

For the DC-3 pilot it was quite a transition to the tricycle gear Martin which had nosewheel steering, reversible props and numerous other modern features. It was described by some as if flying a "pinball machine" with all of the warning lights and gadgets, switches and levers. For example, the DC-3 had 22 items on the "before starting engine" checklist (at an origination), the Martin had 44. Before taking off with the Martin the fluxgate compasses had to be erected, the autofeather turned on and checked (and the manual feather), the usual runup and



mag check, after the flaps were lowered a check of engine in high blower, turn on the ADI and fuel pumps, turn off the cabin heater fan, put the cowl flaps in trail and "pour the coal to it." By contrast, the DC-3 pilots often made their engine runup check while taxiing, were ready to go at the end of the runway and, without slowing down (if cleared for takeoff) were on the roll as the copilot (hopefully) put the cowl flaps in trail. TWA, however, had confidence in their pilots as the time allowed in the scheduled flying time for all flights was five minutes after leaving the gate to the time off; if over five minutes, the crew had to radio operations the reason for the delay (10 minutes for Connies or DC-4s).

The ADI (Anti-Detonate Injection) was a mixture of water and alcohol which was used with the usual full-rich gas and air combination burning in the engine for cooling during takeoff or a go-around when maximum power was needed. With ADI, the engine was rated at 2,400 hp, without it the maximum was 2,050 and there were weight restrictions company dispatch would have to compute. Basically, the max takeoff weight for the M202A was 43,000 pounds wet (using 'ADI'), 40,000 pounds dry. For landing it was 41,000 pounds wet and 40,000 pounds dry.

Auto feather was probably the most controversial feature with the Martin as it had to be in operation for every takeoff (except to ferry the airplane for repairs by a special dispatch clearance, and no passengers or nonrevs). A number of questions were raised why the Wright BD (2,500 hp) engine wasn't used without the necessity of auto feather. George Rodney, engineer and test pilot with Martin during the development stages of the 202, had this comment:

"We backed into this when it became very clear early in the certification process that it was not possible to have an economically viable twin-engine transport if you followed the existing CAR regulation of showing 50 fpm positive rate of climb with a windmilling propeller. Both Martin and Convair came to the same solution of the auto feather system. Many pilots were not comfortable with it, although it was easy to demonstrate that you were in fact much more safe to rely on it."

The system created a lot of problems for the pilots and maintenance for quite a while after the 202As were introduced; one engine feathering on takeoff because of a system malfunction rather than an engine failure. There were also a number of embarrassing minutes following the pre-takeoff check when the engine feathered. In order to restart the engine a mechanic had to be posted outside with a fire extinguisher (per a CAA regulation). Sooooo, there you sat, at the runup area waiting for a mechanic to arrive in a truck with the fire extinguisher and take his post while you started the engine again. The auto feather was turned off after liftoff and a safe speed with the first power reduction, the ADI was turned off after reducing to climb power. A number of pilots confided that they never used auto feather unless there was a check pilot or CAA inspector aboard.

As mentioned in the introductory article with regard to post-WWII aircraft, the Martins had two revolutionary features (compared to the DC-3) for the pilots to consider during an approach and landing, or when the flaps were extended. One was the excellent center of gravity range (CG), which eliminated the usual restriction where the hostess moved passengers to empty seat areas for takeoff or landing. This was due to the horizontal stabilizer arrangement, which provided for automatic

A landing shot of TWA Martin 2-0-2A, N93201. (Glenn L. Martin Co. Photo from the Edward G. Betts Collection)

TWA Martin 2-0-2A, N93202. (Photo from Edward G. Betts Collection)

Kansas City, December 31, 1952: First Officer Brad Berg, Captain Art Shutts and Hostess Betty Olson pause to observe the DC-3 that came in on the last scheduled flight with TWA, about to be towed to the storage area for used aircraft sales. The workhorse for the nation's airlines first saw service with TWA on August 15, 1937. (TWA Photo from the Edward G. Betts Collection)



adjustment of the angle of incidence of the stabilizer with actuation of the wing flaps, thus providing the best CG location during takeoff or landing. The TWA arrangement was quite an improvement over the original Martins that had a series of torque tubes connecting the flap drive system to the horizontal stabilizer. The old torque tube system was located under the cabin floor and was very noisy when operating. It was subject to breaking at an inopportune time for the pilot, leaving him with a very out-of-trim situation with the elevator controls. TWA's system eliminated the torque tubes and used a combination electrical and mechanical system to adjust the stabilizer. On the 404 there was a red warning light on the forward panel to alert if the flaps and stabilizer were out of phase. Both the Model 202A and 404 had aileron boost.

Elias LeBoeuf (engineering) told about an early problem with this system. "The variable incidence stabilizer, operated by an electric motor, had a habit of freezing up during winter operations which rendered the stabilizer inoperative at the worst possible moment. We finally corrected the problem by ventilating the motor and controls to the fuselage and covering the mechanism with a rubber boot. The main cabin heaters were always becoming inoperative when flying in to icing conditions. This was finally corrected by replacing the combustion air pressure regulator with a ventilated type."

Both model Martins had a built-in protection for the wing flaps which prevented them from lowering above certain airspeeds (or they would retract if this speed was exceeded) such as takeoff (12.5 degrees) was 165 kts, approach (24 degrees) 130 kts and landing (45 degrees) 105 kts. The minimum landing speed at the max weight, with full flaps and 50 feet over the approach end of the runway was 90 kts. It was during the transition from approach to landing speeds when a number of pilots had their ego broken . . . if they were too fast the flaps weren't in the position selected, and when they did slow down the flaps extended which caused a higher nose attitude and a series of "balloon" type landings or bounces. As Ben Young described it, "The Martin was not an airplane you flew, you aimed it. On final approach you put the end of the runway three quarters of the way up in the windshield and aimed it until touchdown, then on with the gust lock."

The Martins were accepted and introduced during the summer and fall months when there was not much occasion to fly in icing conditions. Another feature new to the TWA pilots was the hot air system for anti-icing the leading edges of the wings and tail. The pilots were used to the inflatable rubber boot system for de-icing. There will be much more to follow on this subject when discussing the winter operations and the M404.

The Martin was designed for a fast ground time at intermediate stops. The passengers would load by the rear steps while the ground service personnel utilized the forward door. If refueling was needed (and the equipment available) the plane had an underwing system which eliminated the need for ladders and

climbing around in freezing weather (the standard overwing fueling was also available). This almost developed into a tragedy on 8-30-50, when Gene Fox (later a maintenance instructor) was refueling for a pilot check operating from the KCK overhaul base. After unhooking the nozzle from the wing it was carried to the bumper of the fuel truck. The pump engine was engaged to supply power to reel in the hose and, at that time, some eight gallons of gas poured out on the pump engine and it was ignited. He was able to disengage the clutch and stop the flow of fuel, but the fire had burned his hands, neck, face and ears. The truck suffered some damage, but not the plane, as his lead man extinguished the fire and drove the truck away. Gene was hospitalized for eight days plus a month recovering from the burns. Following this incident TWA came up with a new procedure that required a check of the nozzle with a screwdriver, after it was removed, which assured it was completely closed. Later a nozzle was perfected that eliminated this check.

Prior to the inaugurating of service a series of publicity and demonstration flights were made to the stations (all east of MKC) that would initially have Martin service. After the mechanics and ground service personnel were checked out there was the usual proving runs for the benefit of the CAA. Urb Kampsen, on dispatch duty at the time, told about John Col-

lings' reaction to one which was set up to go MKC to DCA with a fuel stop at CMH. John asked: "Why the fuel stop?" When it was explained the plane didn't have the range to go nonstop he remarked: "What the hell kind of an airplane is this?" Dick Colburn and Dave Richwine flew one of the proving runs (MKC-LGA-MKC) on 8-17, 8-18-50; another was flown by Ed Flynn and Floyd Valentine.

There was little publicity given when service began . . . TWA President Ralph Damon was afraid the press would rehash some of the old NWA problems. Initially there were two daily flights (each direction) between MKC and LGA on 9-1-50. (I don't know the inaugural crews other than Ed Flynn flew one MKC-MDW-PIT-LGA.) By late September, with all 12 planes in the fleet, there were five daily departures from LGA and one from PHL. All went by way of PIT and from there five flights landed at CMH and DAY en route to MDW (one), CVG (one), STL (two), and MKC (two). Eastbound there were the same originating stations and en route stops to LGA and PHL. The shortest flight (63 miles, 30 minutes) was between CVG and DAY, the longest (420 miles, 2:15) from PIT to MDW.

Total daily (scheduled) flying time for the fleet averaged 66 1/4 hours, which was flying time for about 30 bid captains. The pay for a full month (85 hours, half day, half night) for an eight-year captain was about \$1,200 a month, the same for the DC-4. This compared to \$1,025 on the DC-3, \$1,298 on the small *Connies*. Copilots still had no bid privileges (other than domicile and vacations) and were paid a maximum \$570 monthly salary after 5 1/2 years (domestic). TWA initiated the "A" Plan retirement in May of 1950.

TWA personnel had been well briefed on the problems NWA had experienced, which included cabin heater fires, control problems in icing conditions, and hydraulic leaks. On 9-4-50, just three days after TWA inaugurated service, NWA suffered another serious accident although there were no injuries or fatalities. Brooks Johnson (our RAPA President) was on his first captain trip on the equipment and was getting line checked by Ira Bortles. It was a hot day and both pilots had their side windows open as the takeoff roll was started out of Billings, Montana. In a short time after accelerating rapidly the cockpit suddenly filled with smoke and Brooks attempted to abort (the

The wreckage of Northwest Airlines' Martin 2-0-2, N93051, one of several 2-0-2 accidents suffered by NWA in the late '40s. (Photo Courtesy of Brooks Johnson, Sr.)

The carry-on bag rack on the TWA Martinliners. (TWA Photo from the Edward G. Betts Collection)

The self-contained rear entry stair featured by both the Martin 2-0-2A and 4-0-4. (TWA Photo from the Edward G. Betts Collection)

runway had a 2 1/2 to 3 degree downward slope) about the half-way point). What had happened, and unknown to the crew, was that the hydraulic (mineral oil in those days) fitting in the emergency brake system (at the accumulator) failed and was squirting fluid on the inverter in the area creating the smoke (there was no fire). A letter from Brooks tells what occurred in the remaining seconds during the abort:

"When the cockpit filled with that very pungent and blinding smoke, I cut the power and went into full reverse—believing that we had a fire. There was deceleration; however, the a/c had gone beyond the runway break. The nose wheel steering, brakes, emergency brakes . . . were all totally ineffective. Reversing the propeller pitch to maximum power failed to stop the a/c. As we 'drifted' off the runway and approached a rock-filled culvert and an adjoining runway light fixture, I pulled the master switch. I have never heard such a (momentary) quiet—and then sickening crunch as the right gear collapsed, taking flap and eyebrow flaps as we crossed the aforementioned culvert. The right outboard wing panel dragged across the floodlight fixture, rupturing the fuel cell. The a/c came to rest tail down (the nose wheel held) with the right wing on the ground. 350 gallons of 100 octane fuel covered the surrounding terrain."

The NWA problems with the 202 continued for the next four months. On 10-13-50, a training flight crashed near Alemelund, Minnesota, following the right propeller reversal en route, killing all six aboard. On 11-7-50, 22 lives were lost when the plane crashed into a mountain during an approach to Butte, Montana. Snow showers were reported in the area of the crash and the plane hit about 30 feet below the crest of a 8,250-foot ridge. NWA voluntarily grounded its remaining fleet of 202s for a week to inspect all center wing sections as there was possible turbulence associated with the weather. Another possible cause was the aileron controls as the plane had a reputation among the pilots for being "squirrely" with certain icing conditions. The CAB accident report, issued 6-22-51, found no fault with the airplane and blamed the pilot and NWA's operating procedures. Their recommendations were more of an edict and effective (retroactive) to early 1951.

The CAB ordered higher ceiling and visibility minimums. The establishment of a concentrated pilot training program for all pilots. A comprehensive inspection of all NWA aircraft. Limited operations to 150 miles for two-engine aircraft (225 miles for four-engine) unless an airport having higher weather minimums was available within such distances and restricted flight schedules to allow sufficient time to accomplish necessary maintenance. These were all temporary restrictions pending the pilot training program and aircraft inspection. However, the 202s were out of the NWA operations by the time this edict was issued.

On 1-16-51, a flight experienced a sudden loss of control in cruise and crashed near Reardon, Washington, killing all 10 aboard. There were no positive clues as to the probable cause





other than the crew radioed "they were out of control and going in." The remaining fleet of planes were again grounded, however, the NWA pilots had already announced they would never fly them again. They were parked until late in 1951, when they were either sold by or leased from NWA.

During TWA's first winter with the 202As there were numerous problems, either mechanical or with icing conditions. In February 1951, John Collings issued an operations bulletin with an order that no flights would be dispatched into a known or forecasted area where icing conditions existed. I don't have many examples of the very early problems, but here are a few:

Joe Bartling told of one with auto feather which gave him the best view ever at the "Rudy Patrick Monument to Grain and Seed" (I think this might be a grain elevator near the old KC airport). On another flight he could not maintain assigned altitude between MDW and DAY with METO power because ice had built up on the wings so fast that the "anti-ice" couldn't cope with it. Joe also told how the prop reversers were good for dispersing fog, if needed. He had taxied out from MDW one night, but the fog was too thick for takeoff. It was now so thick he couldn't see to return to the ramp, but by reversing the props he could blow about 20 or 30 feet of forward visibility and, gradually through this sequence he crept back to the ramp before the tanks went dry. Joe also told how he once set a record by going through two engine starters on a very cold morning, when the oil congealed and they overheated.

Bob Adickes told of an interesting trip (naturally it was at night and stormy) over Wheeling at 8,000 feet with the ice from the props banging on the fuselage . . . with takeoff power he

was barely able to maintain 105 kts until he was finally cleared to a lower and warmer altitude.

Ed Flynn told about a flight out of PIT when light buffeting occurred and the control wheel slowly started to roll to about the 45 degree position with the aircraft straight and level. All that could be observed on the wings were several streaks of ice behind the leading edges and ahead of the ailerons. On another flight he had taxied out of LGA during heavy wet snow. The wings and tail were glycoled and watched carefully. The wind was strong from the NW and he was facing 90 degrees to runway 31 while waiting takeoff clearance. When cleared to go, another visual inspection was made (the temperature right at freezing) and soon after airborne he discovered the rudder wouldn't move. The LGA weather was worsening and the PIT weather was clear, so proceeded there . . . all the time trying to loosen the rudder. PIT maintenance found the entire left side of the fin and rudder covered with ice and the gap between was solid clear ice. It was necessary to use 50 gallons of the hot glycol to remove the ice.

Dick Hempel was copilot with Will Knudsen one dark night and, after landing and reversing at Louisville, every light in the plane (including landing) went out. The 202A had all electrical items connected into one master circuit breaker. He also mentioned that things got so bad that ALPA Council 3 (KC) had an emergency meeting to consider grounding the airplane.

Reggie Plumridge recalled how when TWA first got the 202A everyone, including himself, was afraid to fly in turbulence. One night between MDW and FTW he hit the worst turbulence he had ever been in (before or after) at a low altitude. Several times he lost control of the plane and couldn't read the



instruments . . . but the airplane held together. One of the passengers sent a note to the cockpit to settle a bet that at one time the airplane was upside down.

D.H. Smith checked out in January 1951 and told about one of his experiences after departing MKC on a night when the area was well infested with thunderstorms. He had been cleared to maintain 3,000 feet on an easterly heading. Upon reaching this required altitude for temporary separation, the power was reduced and the plane was performing exceptionally well . . . it continued to climb, even with the power off, the nose pointed down and the gear extended! This smooth, but rapid rise, continued until reaching 9,500 feet and then all hell broke loose with hail, heavy rain, moderate turbulence and lots of cloud-to-cloud lightning. The Martin performed admirably.

TWA had one 202A damaged when it ran off the runway after landing at Louisville on 1-20-51. On 2-19-51 another 202A was damaged when the gear folded after the landing at DAY. TWA was experiencing a number of malfunctions with the warning system at the time. Stan Corey was copilot with Dale Fulton and sent a copy of his report at the time:

"Normal straight-in contact approach was made to runway 24. About 3 to 5 miles out, a check was made to determine if warning horn was inoperative since visual nose indicator had been malfunctioning. Before gear was extended, the throttles were pulled back and no horn blew.

"The tower was asked to give a visual check when we lowered the gear. The gear was then extended and the magnesyn indicated 'down and locked.' The tower said the gear appeared down and normal.

"A normal landing was executed and immediately after touching down the plane slowly settled to the ground and skidded to a stop. There was no indication of a fire breaking out and

all passengers were deplaned in an orderly fashion.

"At no time on the approach on subsequent landing did the horn blow, or other than a safe indication show, on the magnesyn indicator."

Stan also told about another incident when he was copilot with Dale on 3-19-51, when they taxied through a lot of slush prior to departure on a flight from CVG to CMH. After takeoff the plane wanted to dive down and to the right when the flaps were retracted. By returning the flaps to the takeoff position, the problem was temporarily corrected. This was among many of the TWA pilot experiences with an unexplainable control problem due to an icing condition.

The 3-1-51 *Martin Gram* told how the public was accepting the TWA Martins with great enthusiasm. They liked the convenience of being able to carry on and off their own baggage, the low noise level, the comfortable and spacious interiors, the high speed in the air and the reduced ground time at intermediate stops. It also named a few 'annoying' problems such as difficulties with the prop reversing mechanism (installing new blade switches), cabin heater difficulties (were being corrected by removing the combustion air blowers) and miscellaneous difficulties with such accessories as landing gear warning lights, the engine cowl flap mechanism, engine supercharger and carburetor system.

Einar Einarson (Overhaul) explained about the gear warning problems which were primarily with the nose gear because of the location of the position indicator switch box. Moisture collected in this area. When a suitable epoxy was developed this was sealed off. In the meantime the "pogo stick" was installed on the cockpit bulkhead and a hole was cut in the step up to the cockpit which allowed a view of the lock mechanism pushing. If it was not locked the pilot used the stick to push the nose gear

A TWA Martin 4-0-4, N40401, with the new "Half White" paint scheme.
(TWA Photo from the Edward G. Betts Collection)

The belly cargo compartment of the TWA Martinliners. (TWA Photo from the Edward G. Betts Collection)

Under-wing refueling was an innovation on the Martinliners.
(Author's Collection)



lock plunger to a down and locked position. Einar also told how TWA tried to soften the main gear struts, which were as stiff as two telephone poles, by installing a hydraulic damper piston in the drag strut assembly. As far as the pilots were concerned, the M220A had a *very* stiff gear.

As mentioned before, the joint (or splice) that connected the outer wing panels to the main spar were of major concern to pilots who flew the Martins. TWA did not have a failure at this joint during the entire tenure of the Martin fleet, but it did cause extra inspection and care by the overhaul base. John Rouche, Structural Engineer at KCK, told about this:

"The wing spar lower cap joint problem resolved itself into a never-ending round of disassembly, inspection, re-assembly and sealing at relatively frequent intervals. At some time early on the fleet—probably at first base overhaul which was at very low hours in those days—a sample inspection of several bolts revealed a fretting corrosion on the bolts and in the bolt holes. Correction involved reaming the holes in the next larger bolt size, new bolts and improved sealing.

"Unfortunately, the fretting corrosion was still evident at the next inspection, forcing a need to ream in much smaller steps (so as to preserve material in the cup flanges) and setting up an exceptionally large stock of bolts in a multitude of diameters. Fortunately we were able to carry the aircraft through to when they were phased out without having to replace a spar cap."

John also told of a serious flaw discovered early with the 202A, the upper engine mount attach bolt. The mount was somewhat unconventional in that it had only three attach points to the firewall. TWA experienced one failure of this bolt during a landing (don't know the pilot or place), fortunately the plumbing and cables provided enough support to allow the pilot to taxi to the terminal where the unusual droop was discovered. The bolt was found to have suffered some corrosion and a fatigue failure. The fix involved reaming, a larger bolt and more frequent inspection periods.

"Murphy's Law" prevailed on one occasion; fortunately the takeoff was aborted before any damage was done. The 15-gallon ADI tank and 15-gallon alcohol tank were installed in opposite wing fillets; there was always concern that a switch in service would happen, and it did happen at MKC. On the takeoff roll when the ADI cut in the engines torched badly along with a very noticeable drop in power which led to the abort.

A letter from Bill Murphey summed up the situation at the time. He checked out as c/p in August of 1950. Later he tried to drop his qualification on the 202A because the airplane had such a bad reputation (NWA problems). On the day his landings (three in 90 days) expired he was assigned a trip, refused to take it and was fired by his Chief Pilot, Jim Eischied. Thanks to the efforts of Ray Johnson, Ed Breen and others, he was "un-fired" the same day. About the same time the pilots appealed to the MEC for help with regard to the Martin problems and possible corrective action.

Many of the MEC members were flying the Martins at the

time so there was little problem getting their support. A committee of Bob Buck, Bob Adickes and Bill Murphey was formed to make an investigation and a report. They went directly to Martin and were surprised to learn from their engineering staff that many serious uncorrected problems still existed on TWA's aircraft. Following the committee's report the MEC held a special meeting to discuss the TWA pilot stand as a possible boycott or refusal to fly the Martin was under consideration. A letter from Floyd Hall describes what transpired:

"We at TWA had relatively good experience with the Martins. Largely because of the way TWA (Ralph Damon and Frank Busch) approached solutions to the wild rides on other airlines.

"I think it was 1951 when pilots on NWA had reported strange (and sometimes exciting) happenings that really stirred up the pilots on other airlines that used Martins. We at TWA had only a few bad reports from TWA pilots, such as buffeting when ice had accumulated on the wings or fuselage. Once, severe buffeting occurred when an inspection plate on the underside of the wing was left open. Also there had been two incidents at PIT, where the pilots reported a 'sinking' just before landing.

"The MEC met in CHI to consider our position. We were



Baltimore, November 13, 1952: Martin employee Eleanor Page, "Mrs. Baltimore of 1952," christens the *Skyliner Baltimore* with a fire extinguisher as TWA District Manager John Brock and Mayor Thomas D'Alesandro look on. (TWA Photo from Author's Collection)

Models of the Martin 4-0-4 are presented to June Hill, Frank McKee, George Shaw (Martin VP who made the presentation), Mayor D'Alesandro, Joe Peterson and John Brock after the christening ceremony. (TWA Photo from the Author's Collection)

Martin 2-0-2A, N93202, of TWA at the Glenn L. Martin factory in Baltimore, Maryland, circa 1950. (Author's Collection)



fashion we could think of to produce the sink just before landing, and we were unable to duplicate significant sinking."

As a result of this meeting a joint TWA-ALPA committee of Bob Buck, Joe Bartles and Arne Lundberg was appointed who would make an independent investigation and report on the Martin situation. Bob added how Arne's engineering background was valuable to this effort. They made recommendations for about 60 modifications. Ralph Damon promised full company support.

Starting in March of 1950, there had been many changes in TWA's fleet when the first of 28 L794A *Connies* were delivered. The five *Stratoliners* were sold and DC-4s were shifting from the International Division to Domestic. Many of the pilots were qualified on all of the equipment: DC-3, DC-4, Martin and the three models of the *Constellation*. It wasn't easy to keep current with the required three takeoffs and landings every 90 days. Due for delivery in 1952 was the new "super" L1049 model which would require a separate rating. The new equipment hadn't increased the pilot ranks as the DC-3s were phasing out. There had been furloughs and many of those hired as late as July of 1948 never returned. Hiring resumed again on 5-14-51 and a total of 85 copilots were added during 1951, making a total of 1,041 on the system. "Dutch" Holloway was number one, and junior man was Vern Laursen, hired 11-26-51. Vern was also TWA's youngest pilot as he was the last to reach age 60 (February 1987).

The first M404 test hop was on 7-11-51, by "Pat" Tibbs. Also under test was a new "white top" paint job for TWA. If it proved satisfactory the L1049s would be delivered with the same motif and the current fleet of *Connies* and Martins painted as they came through overhaul. A month later TWA announced that it had increased the order for the M404 from 30 to 40 aircraft.

However, the KCK overhaul base received a severe blow on 7-13-51, when the rampaging Missouri and Kaw Rivers overflowed the dikes protecting the airport and flooded the area. There were 11 TWA planes in for overhaul and six were hastily prepared to evacuate. One 202A was among those unable to fly and was damaged.

Clarence Kulp with a *Connie* (a mechanic was copilot) flew the last plane to escape . . . just ahead was Glen Knudsen (also with a mechanic as copilot) flying a Martin. The runway was very wet and, according to Clarence, the 202A used all of the runway and, just at liftoff, one engine had a big backfire. He thought they had "bought the farm," but it was a successful evacuation. John Collings had issued an order that nobody was to take any chances by ferrying planes out of the already flooded airport. Later, according to Urb Kampsen, crew records requested the names of the pilots . . . Urb filled in "Smiths" for the unknown copilots. When Collings looked over the reports he remarked

urged by other airlines to join them in a nationwide grounding of the airplane. Our MEC was sympathetic, but TWA had no really bad experience to go on, and we knew that grounding would probably end the airplane's life and deal a severe blow to TWA, which was already in severe financial trouble.

"The MEC was meeting in Chicago and about 5:00 P.M., I received a call from Ralph Damon saying he wanted to meet with the MEC about the Martins. We, of course, accepted and suggested we come to the TWA offices in CHI, but Mr. Damon said he preferred to come to us, and he did so.

"He was obviously under a strain. When he seated himself in our meeting room, and after a few amenities, he asked us (very bluntly) if our purpose was to promote safety of the plane, or to seek leverage for negotiating on pay scales. We assured him safety was our only consideration for the TWA pilots and (this I remember clearly) he relaxed, leaned back in his chair, unbuttoned his vest and said, 'We have no problem, then.'

"TWA arranged for a small group of MEC pilots to come to MKC where the company would provide any tests we wanted to assure ourselves that the plane was sound. Since 'sinking' was the major complaint that might affect safety, Marv Horstman had an airplane removed from service and we tested it in every

that there were a lot of "Smiths" with the airline, and with a smile complimented all for a job well done.

Bob Buck included a copy of a letter Ralph Damon sent the three committee members which illustrates the company cooperation at the time. This is dated 8-21-51:

"I have received and read with interest the reports of the committee to date and have appreciated them.

"I have particularly appreciated the constructive spirit in which the committee went to work on the problem, the cooperation exhibited and the results that were being achieved, prior to the July 13 Flood in the overhaul shop which of course delayed the progress.

"I am looking forward to further reports from the committee at its convenience based upon assumption of a program in the overhaul shop, which I now understand will begin again approximately 1st September.

"Again thanks for the cooperation exhibited, the help given, and the spirit shown in this joint venture."

(signed, Sincerely, R.S. Damon, President)

The TWA pilots had been stalemated with contract negotiations since early 1950. Karl Ruppenthal was MEC Chairman; negotiating were Dave Kuhn, Fred Austin, John Murphy and Dick Ruble. On 10-11-51, a contract was finally signed that had many of the senior pilots complaining that they were "sold down the river." Copilots (after two years) had full bidding privileges and they were on increment pay (the same base scale as captains plus 48 percent of the applicable flight pay). Copilots were no longer considered temporary apprentices . . . it could be (and was) years in the right seat for a larger number. Although there was no big increase for the captains, all pilots

received a flat \$100 a month retroactive pay.

The M404 received its CAA certification in October and a month later the first plane was accepted and delivered by Jack LeClaire (Jack accepted 11 of the 202A and 36 of TWA's 404s) to MKC. The TWA ground school and "Buddy Club" were more than just busy with all of the training: new copilots, 749A *Connies*, qualifying pilots new to the Martins (both models), checking out those already qualified on 404 differences, copilots or pilots who were bidding different equipment (or transferring to or from International), and the usual semiannual proficiency checks. TWA had 12 M404s by the end of 1951, the remaining 28 were due by June of 1952. Both TWA and EAL planned to inaugurate service in mid-January of 1952.

One important test flight by "Pat" Tibbs was witnessed by a group that included Floyd Hall, Bob Buck and Bob Adickes from ALPA. The TWA representatives included Clarence Robey, Jack LeClaire, Russel Rourke and Gordon Granger. This was to demonstrate a single-engine takeoff with a maximum gross weight of 44,900 pounds. The original certified weight was 43,750, but the M404 received a new certification by the CAA. ALPA wasn't convinced, particularly if the temperature and humidity factors were considered at a high elevation airport. On the day of the tests it was 92 degrees with a high humidity at Baltimore. On the takeoff roll the engine was cut at V1 (the point of the decision to abort or continue), it auto feathered and, according to several of the men observing from the ground, with little climb staggered around for a landing. Bob Buck remarked: "A brave guy indeed!"

Russ Rourke had been with P&W during WWII as a service engineer and came to TWA in 1945 as a planner (in later years





was VP-System Planning). He had observed the first takeoff and reported the takeoff distance to V1 and initial climb was acceptable, but from there on it was marginal. On the next flight he sat in the jumpseat and reported it wasn't as frightening from the air; for more altitude it would be necessary to use full takeoff power (with water injection) instead of METO. However, the CAA wouldn't go for the additional time (more than the two-minute maximum) without increasing the water injection tankage. The pilot group wouldn't go along with the increase in weight (and certain company reps were in agreement) and TWA operated the M404 at the 43,650 pounds maximum during its entire tenure with the company. Eastern, however, operated theirs at the CAA maximum of 44,900. It should be noted that Eastern didn't operate out of some mile-high airports such as ABQ. If compared to today's jumbo jet weights this 1,250 pounds difference appears trivial, but it was important to TWA's marketing as it could mean the difference of seven or eight passengers if a high fuel load was necessary for a flight, or it could be a restriction for "fueling through" at an intermediate stop.

The alternative would be a maximum of five minutes (three of them dry) at full takeoff power. The Martin design permitted excellent engine cooling compared to other commercial aircraft of that era. Norm Parmet, Power Plant Engineer (later VP-Engineering) told about TWA tests to have this raised to a five-minute limit. Norm was no stranger to the Martin aircraft—he was a B-26 pilot in WWII.

"On the 404 aircraft we made an effort to increase the gross weight. My part of this effort was to obtain CAA certification of engine operation for 5 minutes instead of 2 minutes. This was to prove that the airplane would be properly operated at takeoff power in the event of an engine failure at takeoff. Well, we proved the engine could operate for 5 minutes at takeoff power without exceeding any limits. TWA chose not to pursue this further, to my exasperation. I can say this—Clancy Kulp and copilot Knudsen and I spent the better part of two weeks making single engine takeoffs—an experience not calculated for the faint-hearted. We proved however that the airplane could maintain a positive rate of climb on a hot day on a single engine for the five minutes that the engine was at takeoff power."

I am not certain of the timing, but Norm Parmet had the task of correcting the auto feather problems during the early stages of the M202A. The system pickup was mounted on the front of the engine and was a hydraulically operated device connected to the engine torque-meter system. A hydraulic line was connected to this device and routed over the cylinders to the rear of the engine, where the hydraulic signal was converted to a signal to feather the prop in the event the pressure in the line dropped below a certain value. TWA had a number of cases where the external line froze causing an auto feather to occur. The correction was to change the line where it connected to the pickup on the front of the engine. It was rerouted to the base of the cylinders where the surroundings were much warmer. Later, the line was replaced with one having an electrically heated blanket and the problem went away never to reappear.

Russ Rourke also included an observation about stall characteristics. I realize a lot of this is technical, but it certainly helps describe what we were flying back in those days. Quoting Russ:

"The M202 when first certified had no stall warning and spoilers near the wing root were required to induce a stall warning. Shades of the later stick shaker. As to the 404 a similar problem, but different, occurred during certification. The 404 was stretched 39 inches to add a row of four seats. This stretch may have altered the CG somewhat and changed the lift of the fuselage, but the more likely effect was to change the effectiveness of the horizontal tail. As it happened the 404 stall was not traditional with warning, pitch over and no roll. Instead the 404 mushed and lost altitude."

"For certification the CAA required installation of spoilers on the top of the wing near the leading edges. They were about 14 inches long and outboard from the wing root. At least, when close to the ground, it would be better to mush in than nose into the ground."

It was not exactly "Murphy's Law," but one incident was certain to happen, and it did happen on 12-8-51, when an M404 training flight landed at St. Joseph (Mo.), with the gear up. It was often the practice by the instructor on a transition flight to disarm the aural warning in the cockpit that the gear wasn't down and locked when the power was reduced with the flaps extended. The loud horn could be a distraction when practicing

A Martin 4-0-4, N40410, as it appeared fresh from the Glenn L. Martin Company. (Author's Collection)

A full Martin cabin, all first class. (TWA Photo from the Author's Collection)

TWA pilots Grant Nichols and William Sellers in the cockpit of a Martinliner. (TWA Photo from the Edward G. Betts Collection)

stalls or other maneuvers where the gear was not required to be lowered. Roy Thrush was the instructor pilot during a training flight when the gear should have been down; nobody, including another pilot in the jumpseat, realized the mistake until it was too late and a smooth belly landing was made. The training procedures were changed and the aural warning system was not to be deactivated.

George Falkner and Dick Hempel were pilots on one of the M404 proving runs from MKC to DCA and return; both men wrote me their reflections about the trip and I will try to combine their accounts . . . it was a lulu! The load was about 15 observers, half were CAA and the others from TWA or Martin. Ceilings were 200 feet to 400 feet with fog and freezing rain from STL east. About halfway to STL the anti-icers were turned on, they didn't work, so returned to MKC for a plane change. It was later determined the wiring was backwards so the systems could not operate. No problem on the second attempt to STL, but Terre Haute was below limits on the next leg so proceeded to IND. Dayton was the next stop, but it was below limits so proceeded to CMH. However, over DAY the cabin compressor broke which required an emergency descent en route to CMH. The next stop, Wheeling, was below limits so the flight was canceled for the night. The next morning it was off again to DCA. The weather was fair. However, when taxiing out, it was discovered the flight controls were still locked with the unlocking lever swung aside. A Martin rep on board, Phil D'Ambarogi, was summoned to the cockpit and he tore down the side panel and readjusted the mechanical levers which locked the controls . . . another delay, and on to DCA.

Next day they returned (same route, the weather good), but leaving DAY they had a red gear nose light after retraction. They cycled the gear several times and, in any position, the light remained on. George decided to proceed direct to MKC. The passengers were briefed for a possible gear collapse after landing. This included removing the emergency exits (windows) which made the cabin very noisy and cold, the passengers cinching the seatbelts tight and bending over with a pillow on top of their knees during the landing and the emergency equipment standing by. The landing was without incident. The CAA approved TWA with the M404, although they did frown on the Martin man fixing the lock controls instead of a TWA mechanic. It was later determined a 25 cent micro switch was the fault with the gear warning light.

ANOTHER NOTE BY THE AUTHOR: *This second "chapter" about the Martins has been a rather negative description of what was basically a fine airplane (and engine) and probably too technical (I'd like to take the CAA written exam again). There were more than the usual teething "bugs" experienced when a new airplane was introduced. Much credit goes to our ALPA representatives, TWA engineers, maintenance (and instructors), check pilots and the line pilots for making the airplane "air-worthy." A great deal was learned the hard way, by experience.*



Also, many thanks to the TARPA members who answered with their help . . . I didn't have a chance to answer each of you personally. More of your input is to follow. I had a lot of help from many other sources, including (alphabetically): Bob Adams (electronics), Marc Antes and Warren Berg (ground school), John Bing, Einar Einersson, Gene Fox, Harry Gann (Douglas Aircraft), Keith Hagy (ALPA engineer), Brooks Johnson (NWA), Elias LeBoeuf, Lee Maupin, Norm Parmet, Les Patt, Jon Proctor, John Rouche, Russ Rourke and Bob Rummel. □

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