Minicraft Eastern Electra L-188

By Paul Hackmann

Background

The design for the Electra L-188 came about in 1955 as a replacement for the Constellation. The original concept was for a four-engine, mid-size, mid-range airliner to meet the needs of inter-city routes. Lockheed chose to forego a big radial engine and elected to instead use an Allison 501 turbo-prop engine driving a Hamilton Standard propeller, a combination that offered more reliability and fuel economy than either the radial or jet turbine engine could provide. The fuselage and wings were lengthened to allow more fuel and passengers, accommodating Eastern's request for more range and larger seating capacity. The final design offered a seating capacity of 78-104 depending on layout, range of over 2000 miles with a speed of 375 mph at an operating altitude between 20,000 - 25,000 ft.

The first prototype Electra flew on December 6, 1957, with the first production versions flying by May 19, 1958. The Electra received its FAA Flight Certification on August 22, 1958. It entered service with both American Airlines and Eastern Airlines in January 1959 but due to a strike at American, Eastern flew the first commercial route on January 12. The first flight with American was a couple of weeks later.

Three in-flight losses of the Electra between February 1959 and March 1960, led to the Electra losing its certification and being taken out of service. The subsequent investigations reveled that all were caused by the in-flight loss of one of the wings. The accident reports list structural failure of the wing resulting from forces generated by undampened propeller whirl mode. What was happening was that the engine/propeller combination produced a wind vortex that exactly matched the flapping frequency of the wings. This would begin a harmonic vibration within the wing structure that would oscillate more and more until there was an eventual failure of the structure. Lockheed's analysts experimenting with wind tunnel models discovered that once started, the onset of wing failure would take less than 30 seconds. *A similar situation, wind-induced vibrations, led to the failure of the Tacoma Narrows Bridge in November 1940. For more information on this phenomenon and to view videos of both the bridge failure and Lockheed's wind tunnel tests, refer to the Smithsonian Air & Space Magazine site:*
http://www.airspacemag.com/ASM/Mag/Index/2001/FM/Hammer.html

Lockheed redesigned the internal wing structure, engine mounts and nacelles. The FAA recertified the Electra on January 5, 1961. Unfortunately by that time, the Electra was no longer in demand as Boeing produced an all-jet airliner that had the carrying capacity and

range to be profitable. As an aside, no further losses of either the Electras or military variant the P-3 Orion were attributed to this problem.

Eastern designated the redesigned Electra, the Super Electra. Super Electra's continued operating with Eastern throughout the 1960's and 70's, mainly serving a shuttles between major northeastern cities. I can remember flying from Miami to New York in a 727, then flying an Electra from there to Boston and Providence, RI. Eastern was the last major US carrier to operate the Electra, finally retiring it from service with Eastern on November 1, 1977 after carrying, according to Eastern's Fact Sheet, over 27,000,000 passengers.

Markings

I elected to use the markings as supplied in by Minicraft that are for the Electra depicted below:

The paint scheme is the basic white over natural metal. The forward portion of the cowling and prop spinners are red, with Testor's Flat Red being an almost perfect match to the decals.

Building the Kit

I purchased the Minicraft kit with much anticipation. Having read reviews on Minicraft's MD-80, 737 and 757 series of models and purchased the DC-3; I really expected the Electra kit to be on the same par. Wow, what a let down. While the aforementioned airliners offer finely scribed panel lines, the Electra is totally devoid of any except for the two prominently scribed passenger doors on the left side of the fuselage. The Minicraft scriber must have apprenticed at Matchbox.

Construction begins with the vertically-split fuselage, with only minor sanding required to remove the glue seam. The 3-piece wing was tackled next, no problems so far. The next step was to mount the forward portions to the 4 nacelles to the wing. OK, here I experienced some fit problems. Each nacelle was slightly larger than where it attached to the wing, leaving a step that had to be sanded down. Since the nacelles are so small, or maybe my hands too big, this took a lot of effort with 320 grit and sanding sticks. Once I was satisfied with the joins, I attached to wing to the fuselage.

More trouble, the one piece lower wing encompasses part of the lower fuselage and it's too small, not even touching the forward and aft portions of the opening. Fortunately, the upper sections of the wing fit fine. I used some gap filling CA to fix the lower fuselage and then polished the fuselage with finer grits of sandpaper ending with 12000. I finished up the fuselage by putting enough lead shot in the nose to avoid the model from becoming a tail dragger. Since the passenger windows are decals, I painted the inside of the cockpit windshield black and glued it into position.

I washed the model to remove any dust and oils and allowed it to dry. Painting was straight forward. I began with an overall coat of Flat White, followed by a couple of coats of gloss white. Once dry, the areas to remain white were masked off and the model and horizontal stab sprayed with SNJ Aluminum. Lastly the nacelles were masked and the forward portions sprayed with flat red. All masking was removed and the entire model was given a protective coat of Future. While not needed for the decals, the hard acrylic coat provides protection for the gloss white.

The rest of the little parts were painted. The 4-bladed props proved especially challenging to remove from the sprues. Despite care, I ended up breaking one blade from the spinner. The blades were painted medium gray, with flat black cuffs. Spinners were brush-painted flat red to match the nacelles and decals. The nose mount and main mounts are Testor's Polished Steel, with the tires done a hand-mixed charcoal.

While waiting for the little parts to dry, I began decaling the main model. Here I discovered another little problem with the kit. Either the scribed entry doors are too low or the door outline on the fuselage decal is too high. I found that when I lined up the door outlines on the decal with the scribed door on the model, the passenger windows appear to be too low on the fuselage. ***Were I to do this model again, I'd fill in the scribed doors and sand flush. Then I could position the fuselage decals properly and not have to worry about the door decal lining up. Having learned this lesson, I've taken this step on the Minicraft Constellation.***

I finished up by attaching all of the miscellaneous remaining parts. When everything was hanging off at the appropriate place, the model was given a final coat of ½ gloss and ½ flat.

OK as compared to some of the other new releases, I've got to think that this model was done by a neophyte as it has nowhere near the level of detail as the other releases. By the way, the recently released Constellation is also devoid of any hint of panel lines. The model was pretty easy to build, with only the few problems mentioned. The decals went on great, but do take about 5 minutes of soaking before releasing from the paper backing. In all, I'd recommend the kit to someone who would like to try building an airliner. I had fun with it and now I've got three done for my collection.

I made an interesting discovery while researching information for the background portion of this review. I always wondered why Eastern elected to use two tones of blue in their scheme. Refer to the photograph and look at the original Eastern logo located just below the Electra's cockpit. You'll note that Golden Falcon splits the sphere into two halves, one light blue and one dark blue. This was to advertise that fact that Eastern was capable of operating both during the day and at night. These two tones of blue were carried over to the more familiar hockey-stick markings.