

F-35A Could Cost \$80 Million With Multi-Year Orders, Lockheed Says

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GEELONG, Australia—Lockheed Martin F-35A Lightnings could cost about \$80 million each if the stealth fighter is ordered in multi-year lots, the manufacturer says, conditionally backing a call for lower prices from the Pentagon's program chief.

Meanwhile, F-35s at a Red Flag exercises in January and February notionally killed far more than 20 enemy fighters for each F-35 loss, not the initially reported 15, says Brig. Gen. Scott Pleus, the U.S. Air Force officer responsible for introduction of the model into service.

Lockheed Martin's comment on potential unit costs of the F-35A follow a statement of the Pentagon's Joint Strike Fighter program manager, Lt. Gen. Chris Bogdan, that a long-standing price target of \$85 million in 2019 was not low enough. The price in 2019-20 should be \$80 million, Bogdan said at the Australian International Airshow at Avalon, Geelong, this week. The most recently negotiated figure, for production lot 10, is \$94.6 million.

The \$80 million target is reasonable, says Jeff Babione, head of the program for Lockheed Martin, also speaking at the Australian show. But cooperation from customers is needed, he adds: the price can come down if customers contract for several years of production at a time, rather than the usually yearly lots.

Babione suggests that customers should negotiate a contract for three years of production, then one for five years.

These prices include the aircraft's Pratt & Whitney F135 engine and compare with the \$60-65 million unit price of the F-16, a much smaller fighter, of 9.21 metric tons (20,300 lb.) empty weight. The F-35A's empty weight is around 13.2 metric tons.

The F-35A, the most numerous version of the Lightning, operates conventionally from concrete runways. F-35Bs, capable of vertical landing, and F-35Cs, designed for catapult launch and arrested recovery on aircraft carriers, are more costly.

Lockheed Martin is looking for ways of reducing the cost of the program other than multi-year contracts. One is to build a simpler version of the elaborate engine trailer, one that would be used on land only and lack features needed for handling the F135 at sea. The company has talked to the trailer manufacturer, Marand of Melbourne, Australia, about changing the design, Babione says.

As director of the U.S. Air Force's F-35 Integration Office, Pleus says he took a close interest in the first appearance of F-35As this year at Red Flag, a regular exercise Nellis Air Force Base, Nevada, that presents U.S. and allied forces with highly realistic and challenging air combat training.

Asked to comment on Aviation Week's report that the F-35 achieved a 15:1 exchange ratio at the exercise, Pleus said the result was in fact "well north of 20:1." Like Bogdan, Pleus emphasizes that data collected and shared by F-35s in the exercise raised the effectiveness of accompanying fighters of earlier types.

Differences in pilot quality was not a factor in the F-35A's performance, he adds. F-35As at Red Flag averaged 90% readiness for full mission capability, the air force officer says.

Even without multi-year contracts, production costs for the F-35 are falling. This is usual for manufactured items. Aircraft production commonly shows something like an 80% learning curve, meaning that each time the number of units is doubled the marginal unit cost falls by 20%.

Babione says the F-35's learning curve is steeper than that at Lockheed Martin's Fort Worth facility, which does much of the fabrication of the fighters, plus final assembly and checking out. For production lot 9, currently in manufacturing, the learning curve factor is 75-78%, Babione says.

For one of the two major airframe manufacturing partners, BAE Systems, the curve is flatter, meaning costs are falling more slowly, because that company's processes are heavily automated, Babione says. Highly automated work tends to be efficient but not easy to improve. For the other big airframe partner, Northrop Grumman, the curve is steeper.