WASHINGTON—The U.S. has brought its dispute with the European Union over its support for Airbus back to the World Trade Organization, arguing Friday that Brussels failed to halt billions in subsidies for the aircraft producer.

The EU says it has fully complied with the WTO decision from last June, but the U.S. disputes those claims and is asking the global trade body to set up a panel to decide the matter.

The U.S. and EU have waged a seven-year proxy war on behalf of the world's dominant plane makers, and the WTO has found that the governments provide billions of dollars in unfair support to Airbus, a unit of European Aeronautic Defence & Space Co. and U.S.-based Boeing Co. Now the governments, which also support the aircraft companies through military contracts, are jockeying over how to comply with the subsidy rulings.

U.S. Trade Representative Ron Kirk helped escalate the quarrel Friday, arguing in a statement that not only are Europe's subsidies still in place, but the EU has even provided new ones.

"The European Union's aircraft subsidies have cost American aerospace companies tens of billions of dollars in lost revenue, which has cost American workers their jobs and hurt their families and communities," Mr. Kirk said.

The U.S. has requested the WTO to meet on April 13, with the aim of establishing a compliance panel. If the WTO determines the EU hasn't complied, the U.S. could seek permission to impose retaliatory measures expected to approach $10 billion a year.

Earlier in March, the WTO largely upheld a ruling from a competing case the EU launched against the U.S., finding that Boeing received billions of dollars in illegal subsidies from U.S. federal and state agencies.

EU trade spokesman John Clancy expressed disappointment in the U.S. move and pointed the finger at the U.S. for not confirming its compliance with WTO obligations in the case of Boeing.

Many experts expect the final outcome to be a negotiated settlement, and some note the U.S. appears to have the upper hand, given that Airbus, which is partly government owned, has emerged as the more heavily subsidized. Last May, the WTO found that European countries had given Airbus about $18 billion in illegal launch aid, while the Boeing ruling turned up closer to $4 billion in unfair subsidies.