Under the RADAR: Modeling the RADAR Cross-Section of Aircraft To Enhance Stealth Capabilities

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The element of surprise in the world of military aviation is stealth which determines an aircraft's survivability. Exploring advanced aviation technology influenced the investigation into the stealth aspect of aircraft. This experiment will assess the shapes of aircraft and their reduction of RADAR Cross Section (RCS). Glue a perfect cube with six pieces of cardboard into one cubic meter. First, make a hole in the center of one side for the flashlight, then cut three sides of an 80cm by 30cm flap opening towards the hole side 30cm away. Poke a paperclip hook at the center of the side under the flap. Loop a string from the flashlight to the center of the flap; place the Lux meter to secure the string around it. Position the sensor above the flashlight in the box and use a toothpick to tape the cord against the side. Carve three-dimensional aircraft foam models at 1:100 dilation. Suspend model using a 200cm string loop at paperclip hook. Activate the flashlight for 15 seconds and record the Lux reading for five trials at each model. Record the box for control. The Sukhoi Su-57, Chengdu J-20, B-2 Spirit, and F-35A Lightning II read 53.32, 49.22, 36.32, and 36.40 Lux respectively. The Lux value corresponds to the light reflected back, or a plane's perceptibility on RADAR. If an aircraft has curved edges and a streamlined profile, then there will be a smaller RCS.

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