The NASA Langley Beechcraft B200 King Air (NASA 529) is an all-metal, twin-turboprop research aircraft. NASA Langley acquired this aircraft in 1996 for program support. The aircraft has been modified with two nadir-viewing ports: 29.5 x 29.5-in. in the forward section of the passenger cabin and 26.75 x 22.5 in. in the aft section. These downward-looking portals allow the use of a wide variety of optical, laser, or R-F based devices that might require a nadir look angle out of the aircraft. Research-supporting subsystems, such as electrical power distribution, TCAS, GPS and satellite phone communications also have been installed. The crown of the aircraft has been structurally modified to accommodate atmospheric sensors, such as an isokinetic aerosol inlet. Finally, a pylon has been mounted beneath each wingtip. These pylons are suitable for carrying aerosol probes with weights of up to 50 lbs. In its current configuration, the aircraft serves as the primary flight platform for a suite of aerosol and cloud remote-sensing instruments, including the NASA Langley High Spectral Resolution LIDAR (HSRL). The aircraft is fully IFR capable.

The research power system contains three 50-A AC inverters which supply up to 4200 W of research power. An Iridium satellite phone system has been installed to facilitate both remote voice communications as well as data modem transfer.

This aircraft nominally flies mission profiles up to altitudes of 28,000 ft, but with prior coordination, is capable of conducting operations in the National Airspace System up to the aircraft's service ceiling of 35,000 ft. Typically, the aircraft can carry a 1000-lbs payload, three crewmembers (two flight crew and one system operator) and remain airborne for four hours covering approximately 800 n.mi. The aircraft is limited to a maximum certified takeoff weight of 13,500 lbs. The aircraft has successfully operated in both domestic and international deployments. In summary, the NASA Langley B200 aircraft and its flight team provide an efficient and effective operational platform for small to medium-sized science payloads, especially those requiring or desiring unique integration, dedicated flight profiles, coordinated flights with other platforms, or flight patterns in congested airspace.