= Project Isinglass =

Project Isinglass was the code name given to two heavily classified , manned reconnaissance aircraft studied by the Central Intelligence Agency (CIA) as potential replacements for the Lockheed A @-@ 12 and SR @-@ 71 during the mid 1960s . The first proposal under the Isinglass name , a high @-@ altitude plane to fly at Mach 4 to 5 , was considered an insufficient advancement over existing aircraft ; the second , much more advanced design , sometimes referred to as Project Rheinberry , was an air @-@ launched , Mach 20 rocket @-@ powered boost @-@ glide aircraft that would use a very @-@ high @-@ altitude trajectory to avoid defenses . This aircraft was considered too costly for development , and the project was abandoned in 1967 .

= = Origins = =

Project Isinglass was developed as a result of the vulnerability of existing manned reconnaissance aircraft , such as the Lockheed U @-@ 2 and the Lockheed A @-@ 12 , to Soviet air defenses in the early 1960s , catalysed by the shooting down in May 1960 of Francis Gary Powers . Although there were continuing plans to overfly the Soviet Union with the A @-@ 12 ? referred to by the CIA as Project Oxcart ? these failed to come to pass , and the CIA began plans for an aircraft with superior performance to replace Oxcart .

= = The Convair proposal = =

The initial aircraft proposed under the Project Isinglass name was developed by the Convair division of General Dynamics , and was developed from work done on the Super Hustler , FISH , and Kingfish programs , as well as leveraging off work done on the F @-@ 111 tactical bomber . Convair 's design utilised avionics and hydraulics systems that had been developed for use by the F @-@ 111 , and was intended to be capable of cruising at speeds of Mach 4 to Mach 5 , at an altitude of 98 @,@ 000 ft (30 km) . The feasibility study conducted by General Dynamics was completed in the fall of 1964 ; the aircraft was determined to be too costly , and was also still considered potentially vulnerable to projected Soviet air defense capabilities , so the project was halted .

= = The McDonnell proposal = =

= = = Design and development = = =

An alternative design completed by McDonnell Aircraft in 1965 is usually considered part of Project Isinglass , however some documents refer to the aircraft as having been codenamed Project Rheinberry . McDonnell 's proposed boost @-@ glide aircraft , submitted to the CIA independently of the Convair Isinglass proposals , featured a small , manned , rocket @-@ powered craft with a high lift @-@ to @-@ drag ratio that would be air @-@ launched by a B @-@ 52 bomber while flying over the Atlantic Ocean . The aircraft would ignite its rocket engine and adopt a trajectory that would take it over the Soviet Union at speeds of Mach 20 and at an altitude of over 200 @,@ 000 feet (61 km) , before descending over the Pacific Ocean to a landing at Groom Lake , Nevada , as a glider , landing on the lake bed using a skid landing gear .

The Isinglass / Rheinberry concept was considered to be superior to spy satellites in a number of ways , including rapid turnaround time and quick response capability . As there was little funding to be had from the CIA budget , McDonnell developed the aircraft using its own funds , although technical support gleaned from Oxcart was supplied by the CIA . The McDonnell Isenglass / Rheinberry proposal 's shape remains classified , although it has been described as being similar to the Space Shuttle , albeit much reduced in size . A 1 / 3 cross @-@ sectional model of the aircraft was constructed to illustrate the principles used in its construction .

Simulations showed that the aircraft would be essentially unstoppable by existing or projected air defenses ; even surface @-@ to @-@ air missiles armed with nuclear warheads could do no better than force the aircraft to change course to avoid the fringe effects of the explosions .

= = = Cancellation = = =

Following fourteen months of work , McDonnell had developed the aircraft to the point where serious proposals were made for its construction . However , neither the CIA or the National Reconnaissance Office had an official requirement for such an aircraft ; in addition , the projected cost of the aircraft was astronomical , the cost for eight aircraft being projected to be $ 2 @.@ 6 billion USD in 1965 dollars (inflation adjusted US $ 19 @.@ 52 billion in 2016) , a sum considered to be far too high for the available budget . In addition , there were concerns that the aircraft 's trajectory could be mistaken for that of an incoming ballistic missile .

When the CIA failed to receive approval for funding , McDonnell approached the U.S. Air Force with the project ; however the Air Force proved uninterested in adopting the CIA project , despite the support of General Bernard Schriever , chief of the Air Force Systems Command . Therefore , in late 1967 the Isinglass project was terminated , with a brief effort to revive the project in 1968 proving unsuccessful .

= = Engine development = =

Although the development of the Isinglass / Rheinberry aircraft was conducted using McDonnell 's own funding , the United States Air Force 's Air Force Rocket Propulsion Laboratory did fund the development of the aircraft 's intended engine , the Pratt & Whitney XLR @-@ 129 , intended to be a reusable rocket engine . To be powered by liquid hydrogen and liquid oxygen and producing 250 @,@ 000 lbf (1 @,@ 100 kN) thrust at full throttle , development of the XLR @-@ 129 continued even after the cancellation of Project Isinglass , and was considered for use by the Space Shuttle , but was cancelled in the early 1970s .