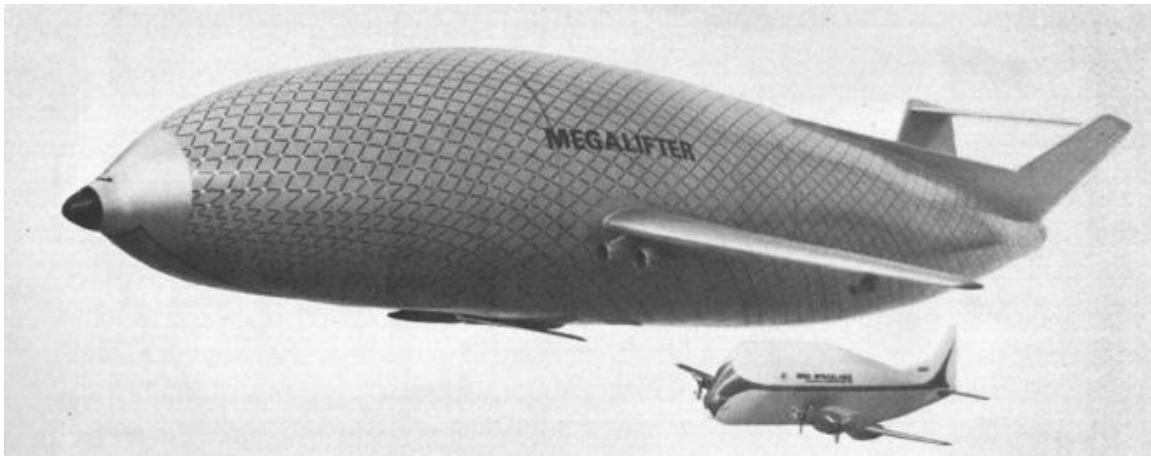


Magalifter hybrid airship

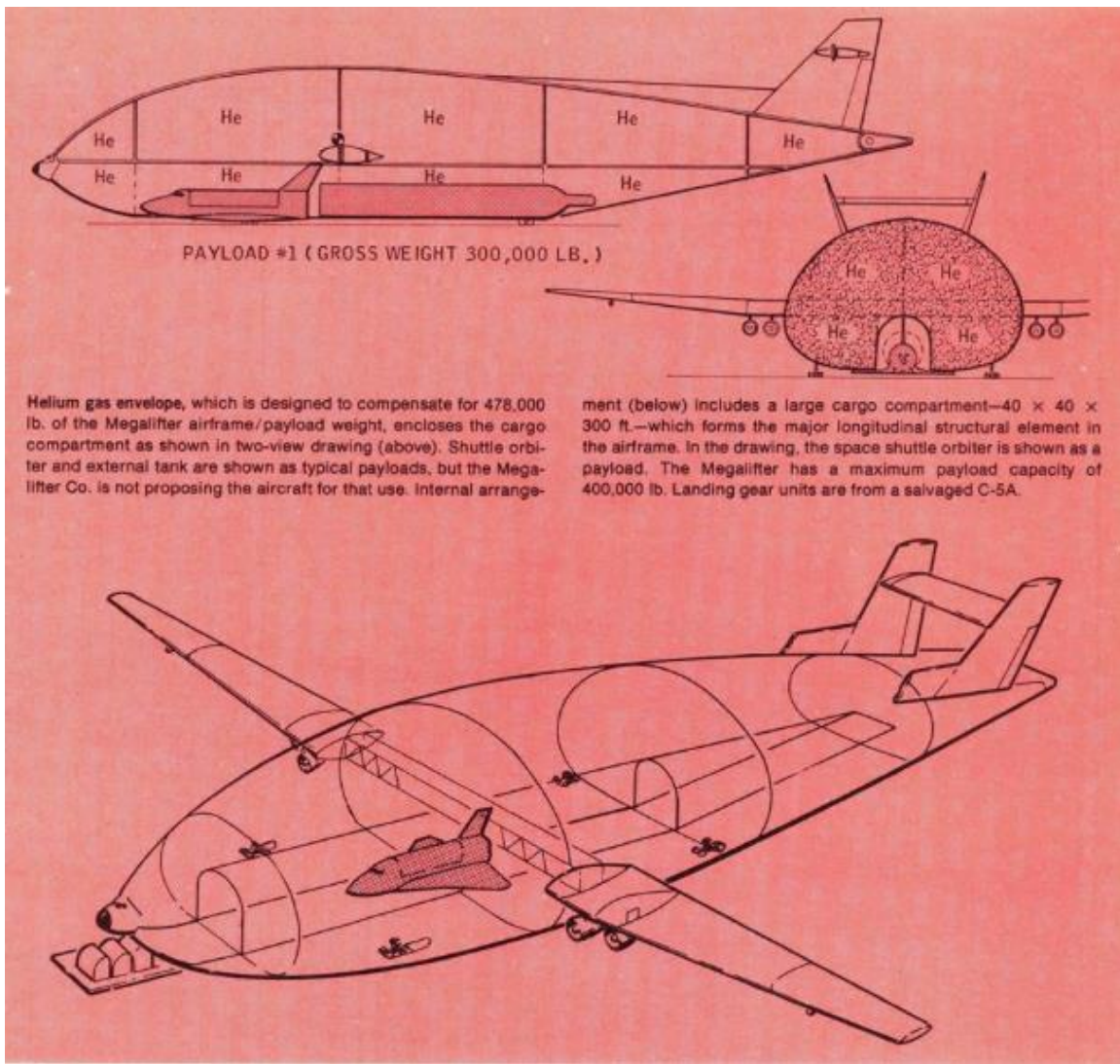
Peter Lobner, 1 May 2019

The concept for a semi-buoyant, heavy-lift cargo aircraft with a helium-filled fuselage seems to have originated in 1972 with Frank M. Clark, one of the founders of Magalifter Co. The main advantages claimed for this giant hybrid aircraft design included greater stability, larger payloads, lower cost and shorter takeoff distances than conventional transport aircraft. With financial support from Howard Hughes (or Summa Corporation), work on the Megalifter continued until Hughes' death in 1976.

This giant aircraft was 650 feet (198 meters) long, had a maximum fuselage width of 115 feet (35 meters) and a wingspan of 530 feet (115 meters). The shape of the Megalifter's rotund, lifting body fuselage was defined by an "exoskeleton" comprised of geodesic-shaped, small-diameter, tubular structural members. Within that framework, the helium lift cells were positioned around a 300 x 40 x 40 foot (91.4 x 12.2 x 12.2 meter) cargo compartment. The cargo compartment was designed as the structural spine of the aircraft, running from the flight deck to the tail structure and integrated with the transverse wing box and the tail structure to establish a rigid frame.



*Scale comparison: Megalifter and the Aerospacelines Super Guppy.
Source AW&ST magazine 29 July 1974*



PAYLOAD #1 (GROSS WEIGHT 300,000 LB.)

Helium gas envelope, which is designed to compensate for 478,000 lb. of the Megalifter airframe/payload weight, encloses the cargo compartment as shown in two-view drawing (above). Shuttle orbiter and external tank are shown as typical payloads, but the Megalifter Co. is not proposing the aircraft for that use. Internal arrange-

ment (below) includes a large cargo compartment—40 × 40 × 300 ft.—which forms the major longitudinal structural element in the airframe. In the drawing, the space shuttle orbiter and external tank are shown as a payload. The Megalifter has a maximum payload capacity of 400,000 lb. Landing gear units are from a salvaged C-5A.

General arrangement of the Megalifter aircraft and its helium gas cells. Source AW&ST magazine 29 July 1974

The aircraft would have had an equivalent weight of 247,000 pounds (112,037 kg) when the gas envelope was filled with 7,000,000 cubic feet of helium, which has a sea level buoyancy 478,000 pounds (216,817 kg). Maximum payload was about expected to be about 400,000 pounds (181,437 kg / 181 metric tons).