

SNAPSHOTS  
OUT OF THE PAST

PORTRAIT OF AN EARLY ROTARY WING  
ENGINEER/ENTREPRENEUR  
GLIDDEN S. (GLID) DOMAN:  
HELICOPTERS TO WIND TURBINES

by John Schneider

**F**ifty-some years ago, our friend, Glidden S. (Glid-for short) Doman could not have predicted that far in the future he might be prospecting in the world of giant wind mills! The pursuit of modern wind (mill) turbine technology has led him into developing rotors in the 200 to 300 ft. diameter range in several countries around the world. Glid may not have thought he would even be in the helicopter (or rotor) business when he graduated from the University of Michigan in 1942 with a B.S. in Aeronautical Engineering. But he was soon caught up in the helicopter world, founding his own company, Doman Helicopters, within 3 years of graduation (after a stint with the Engine Div. of Fairchild and then Sikorsky Aircraft).

Glid created the Doman Helicopter Company in August, 1945 with the purpose of developing new rotors based on a semi-rigid, four-bladed hingless gimbal-hub rotor. The aim of this design was to eliminate the coriolis forces by using a non-rotating rotor system ball joint along with a constant-velocity drive shaft universal joint within a stationary pylon — in essence, a vibration-free and low fatigue-stress system.

**W**ith the development of the first rotor, his team began tests of the rotor installed on their LZ-1 (Fig.1) helicopter (using the Air Force-loaned R-6



fuselage). Successful demonstrations of the LZ-1 quickly led to the need for more capital and Doman-Frazier Helicopters was incorporated. A further need for manufacturing space for development of the LZ-1A and LZ-2 (with Doman-designed fuselage and systems) resulted in a move from Stratford to Danbury, CT in late 1947, followed by a company realignment and a return to the name, Doman Helicopters, Inc.

Further improvements to the concept were embodied in their LZ-4 (Fig.2) which was purchased by the then-suffering Curtiss-Wright Corporation in 1950 in an attempt at diversi-

fication into the helicopter business. Called the CW-40 by Curtiss, flight operations/demonstrations were flown by Doman Helicopters as part of the deal; but no further business developed for Curtiss-Wright for they had stepped on HST's toes in the



*Top: Figure 1. The Doman-Frazier rotor system shown above as used with the fuselage of an Army R-6 helicopter. Middle: Figure 2. Doman LZ-4 (Curtiss-Wright CW-40) of 1950. Bottom: Figure 3. Doman YH-31 (LZ-5) 8-place helicopter.*



Figure 4. 4MW WTS-4 Wind Turbine (257 ft. diameter).

WWII congressional investigations of airplane contractors.

In the meantime, Glid (and Doman) had continued with further development into a larger and higher-powered improvement — the Doman LZ-5 (Fig. 3), a six-to eight-place, 400 hp, 48 ft. diameter rotor helicopter of about 5,000 lbs. gross weight.

In September 1953, Stanley Hiller announced the purchase of production rights! The U.S. Army had shown an interest in the helicopter and the proposed Army version had flown in April 1953. The Hiller acquisition was engineered by Colonel Bill Bunker of the Army Transportation Corps. With Hiller H-23 production declining towards the end of the Korean War, it seemed that there was a need for the Hiller-Doman sized H-31

between the 3-place Bells and the larger Sikorsk's and Piasecki's. However, others within Army Aviation had other thoughts, and in the showdown between Col. Bunker and General Bob Williams, the Army elected to develop a slightly larger new helicopter powered by the upcoming Lycoming T-53 shaft turbine! This eliminated consideration of the YH-31 and Hiller pulled out of their deal. Another company, Fleet manufacturing, Ltd. of Fort Erie, Ontario (in a jointly owned operation, Doman-Fleet Helicopters) subsequently flew the improved Doman-Fleet LZ5-2 in Canada but it was too late. The Bell Huey was well underway and couldn't be caught!

Like many others attempting to enter the post-WWII expanding helicopter field, some with much-better cash reserves and others with better timing, Doman was not to progress much further. His banner LOH design study for the Army (copied by others) and his mid-60's LZ-5 civil variant, the D-10B (nursed along by Glid and by ex-Vertol Don Berlin) led to no-further business. There was just too much competition, the usual problem in a post-war economy!

In 1970, Glid Doman joined Boeing Helicopters (where I first met him) heading up the HLH rotor blade design activities and later on he contributed to the UTTAS proposal efforts. Glid would never, as I said before, have guessed that his next step would lead to giant wind turbines, built around the world. In 1974, Glid became Research Manager/Rotor Technology, and in 1975 Principal Investigator on the Energy Research and Development Administration (ERDA) contract for investigation of Dynamic and Structural Characteristics for very large wind turbines (Some may remember that another helicopter pioneer, Wayne Wiesner, was also a member of that same Boeing group).



Recent photo of Glid Doman.

Following a Boeing decision to not pursue wind turbine contracts, Glid joined Hamilton Standard where he subsequently became System Design Manager on the 3MW and 4MW WTS-3 and WTS-4 (Fig. 4) wind turbines and most recently, on the Italian GAMMA 2MW System.

I recently visited with Glid at an AHS Forum (Fig. 5). I thought how can an engineer who has been through as many ups and downs of a 50 year aerospace career look so great? I salute you, Glid!

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