



DOMAN HELICOPTERS

Helicopter Pioneers

American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

MAY 11



Pioneers: Kaman,
Doman, Sikorsky,
Hiller, Piasecki . . . 38

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The Helicopter
Industry Today 26

35 cents

1953 American
Aviation cover story
identifies helicopter
“pioneers”

Charles Kaman,
Glidden Doman,
Igor Sikorsky,
Stanley Hiller,
and Frank Piasecki



Glid Doman and the Doman LZ-5 helicopter, circa 1953

God takes care of helicopters.

Igor Sikorsky



INTRODUCTION

In 1943, a 22-year-old engineer named Glidden Doman learned that a Sikorsky helicopter had broken a blade during a delivery flight. Helicopters were needed in the War effort, but their rotor blade life was unsatisfactory. The infant helicopter industry barely understood rotor dynamics.

Doman took a job at Sikorsky and, with intensive experimentation and flight testing throughout the War, made considerable improvements in the helicopters' blade life.

He didn't find all the answers right then, but became intrigued by questions no one else was asking.

In 1945 he left Sikorsky
and founded his own firm to pursue them.

Doman Helicopters began work in a Connecticut cow pasture. Over the next 24 years, it won contracts with the U.S. Army and Navy and drew potential commercial customers on four continents.

The company constantly innovated solutions decades earlier than larger competitors. Some of these ideas are now standard in helicopter technology.

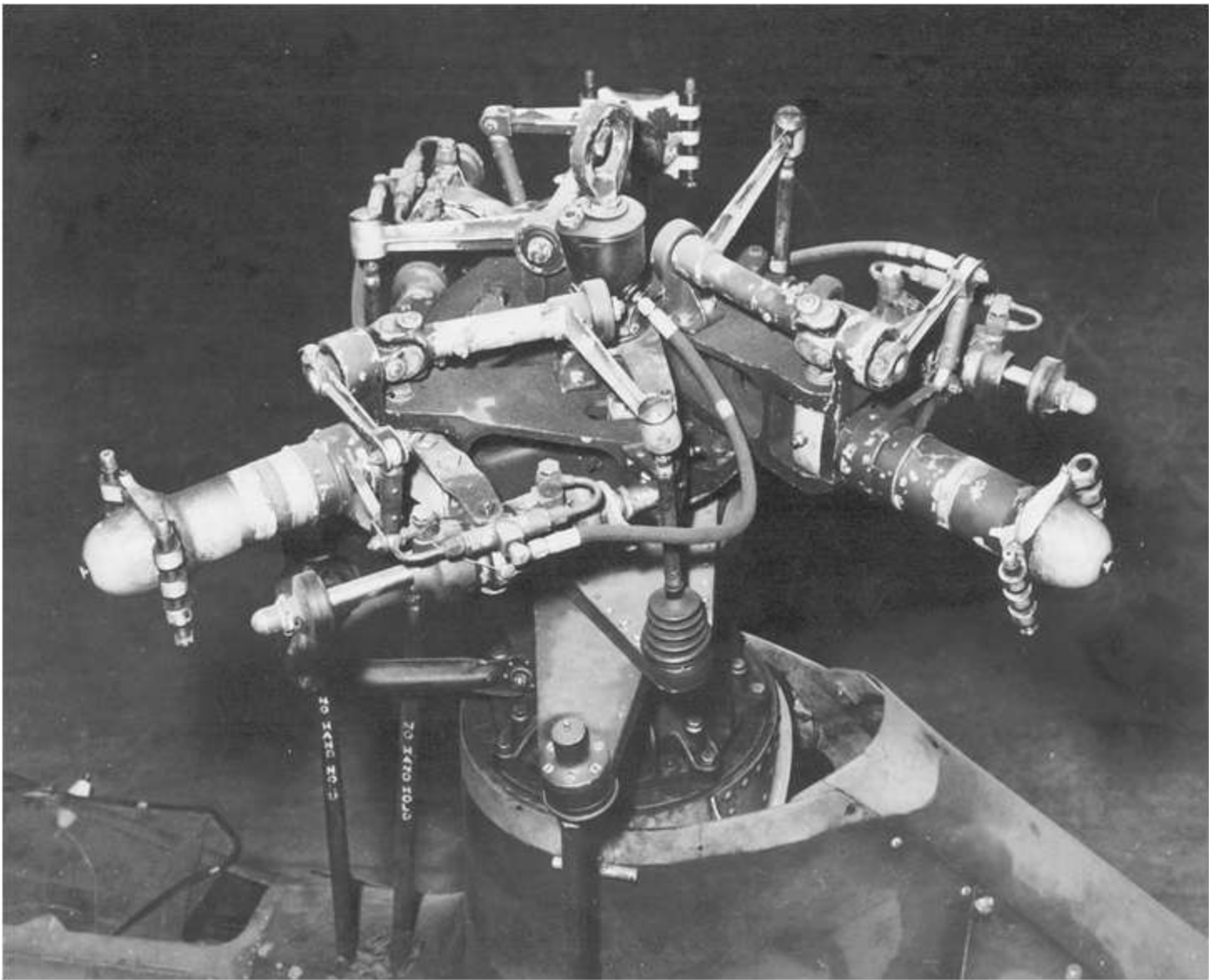
Some, arguably, still await widespread adoption.



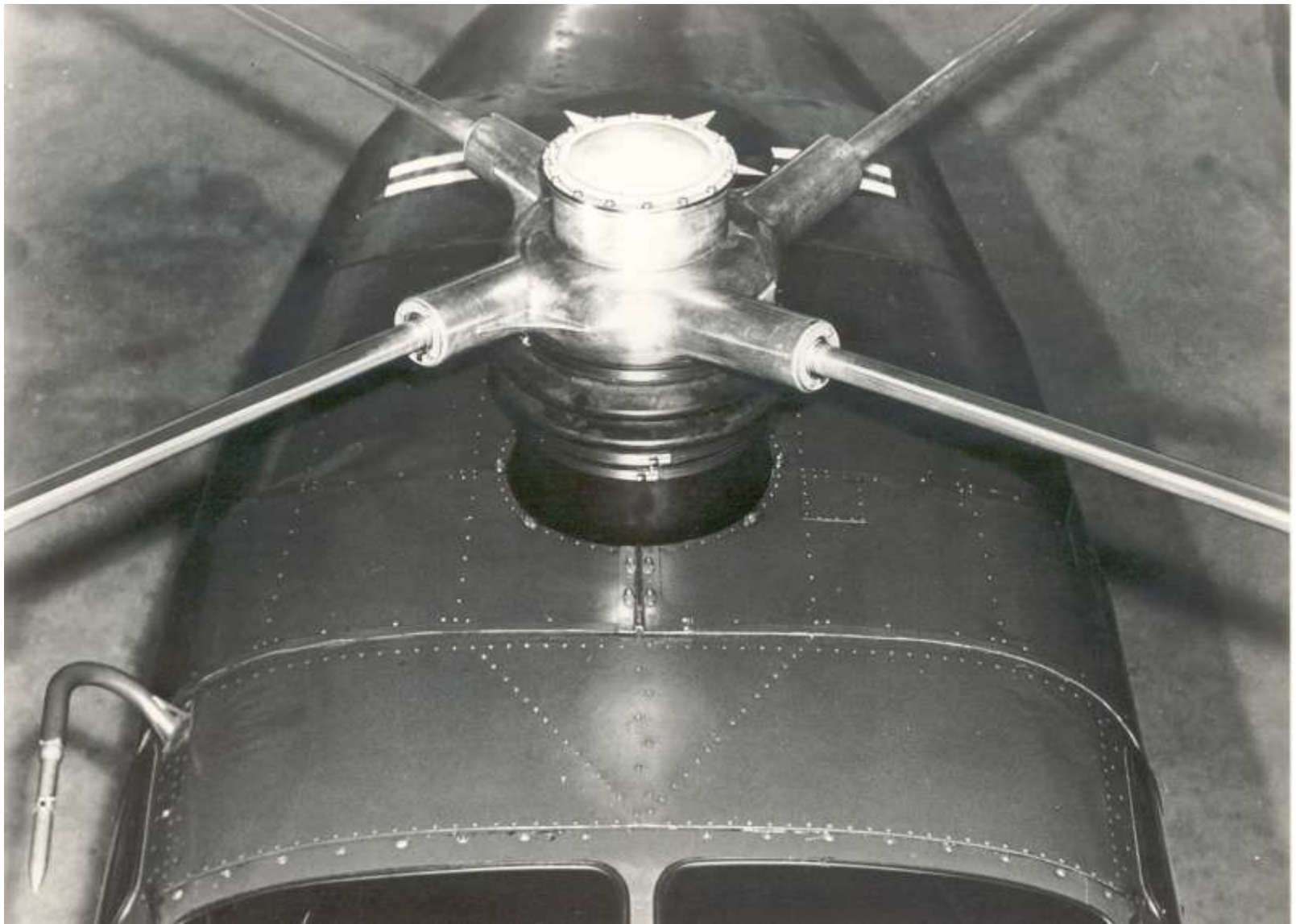
The driving force behind Doman engineering was sharp focus on understanding what the helicopter and especially its blades and rotor hub were doing.

The resulting insights produced the firm's hallmark trait – aeronautic design with almost elegant simplicity.

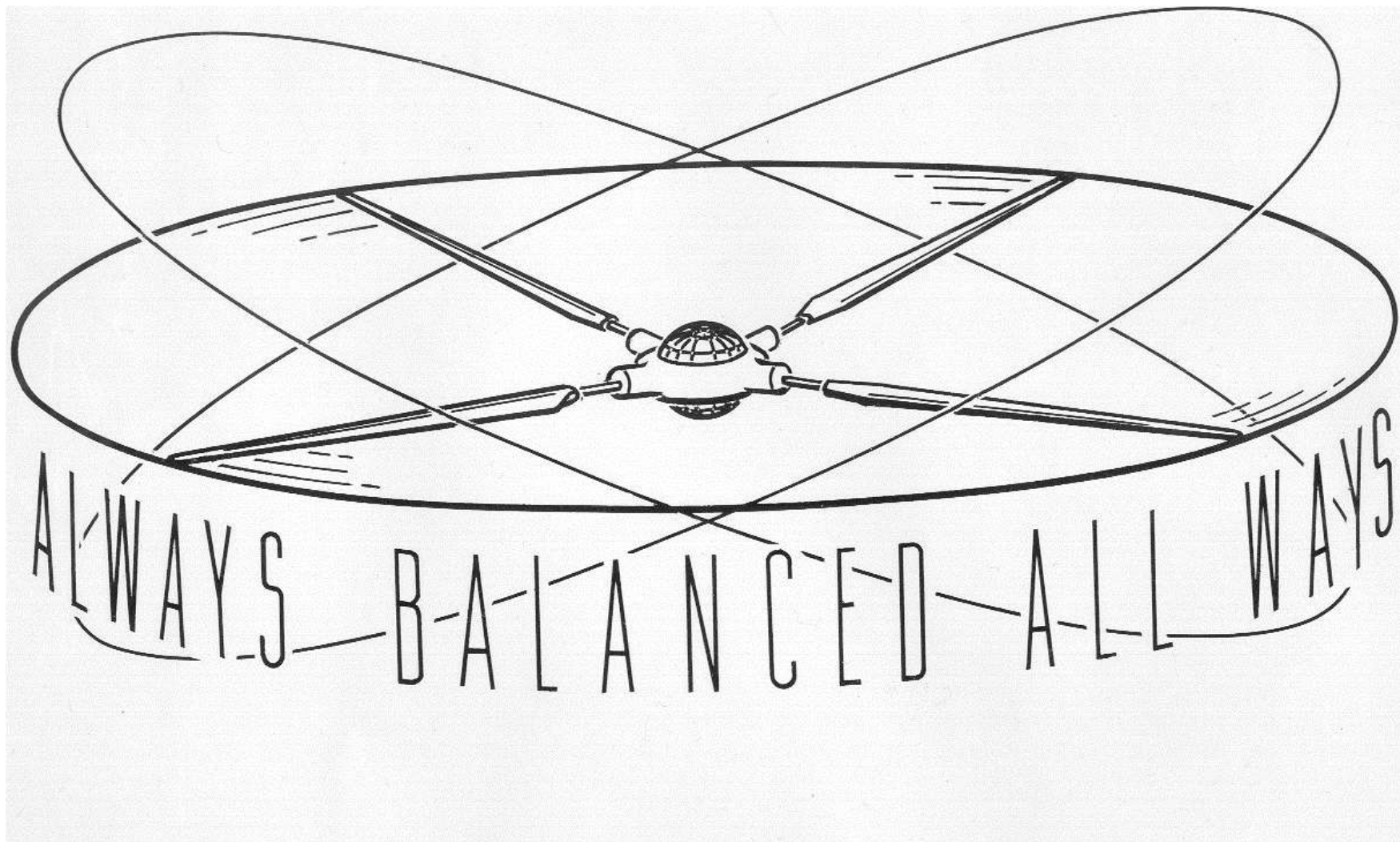




The complex Sikorsky rotor from the Sikorsky R-6 helicopter



The elegant and simpler Doman rotor (LZ-5)



The "Always Balanced All Ways" Doman logo was used in the earliest efforts to explain the rotor fundamentals in various publicity situations



Artist drawing of first Doman helicopter concept, the LZ-1, which was never built. Somebody called this design the “Little Zipper” which initiated use of the letters LZ in subsequent model numbers.
Picture and article in published by *Aviation Week*, July 1946



THE DOMAN R-6 / LZ-2

**Doman Conversion of the
Sikorsky R-6**

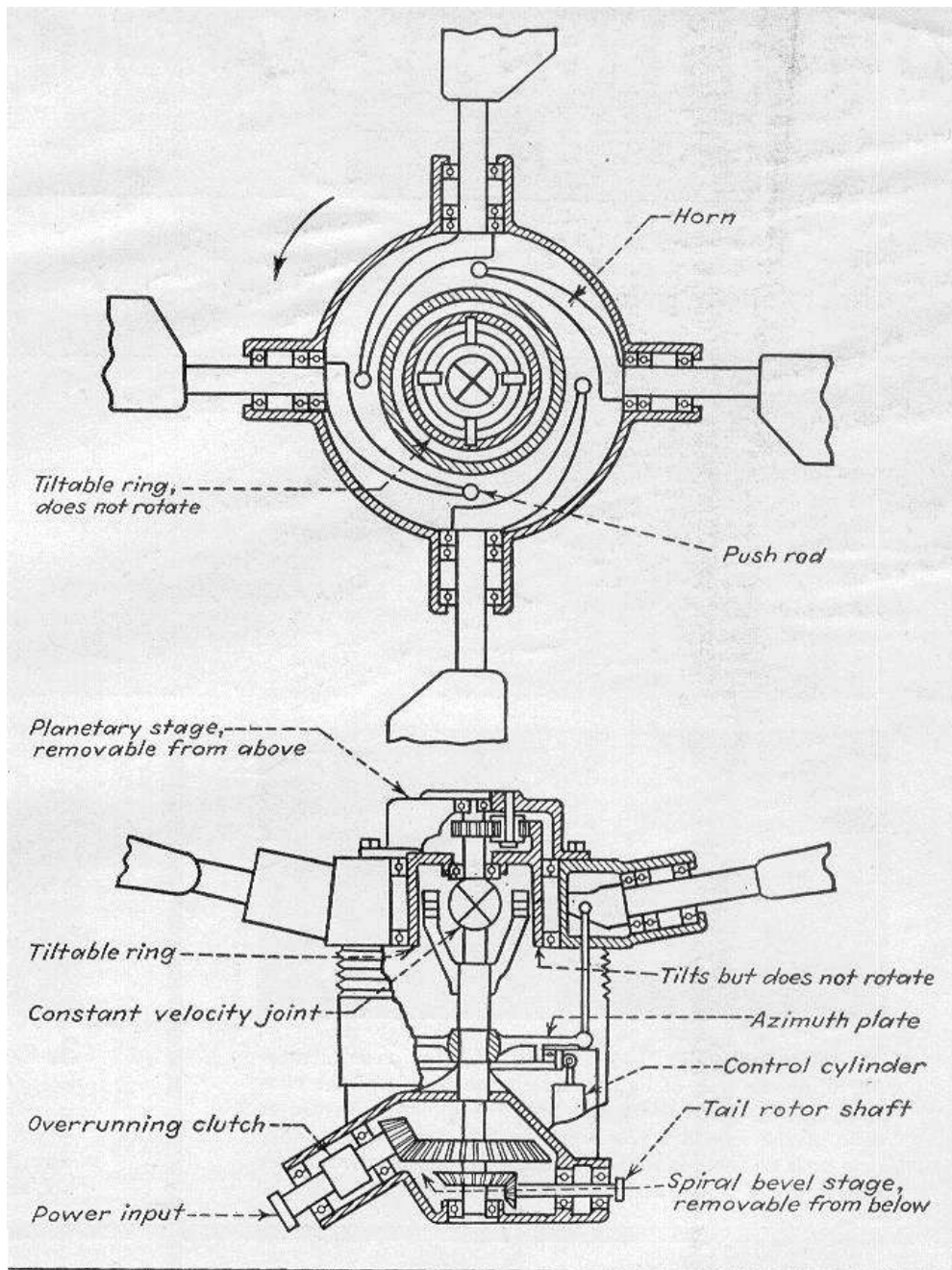
In 1946, the firm acquired a Sikorsky Army R-6 and replaced its rotor with the first Doman rotor design.

This became the prototype LZ-2

A decorative graphic element in the bottom-left corner of the slide, consisting of overlapping blue and black geometric shapes.



An early flight of the LZ-2/R-6 at Stratford, Connecticut.
Its first flight was in August, 1947



The basics of the
Doman rotor –
Diagram used by Dr.
Alexander Klemin,
Dean of the
Guggenheim School
Aeronautics, New York
University, published
by Dr. Klemin in *Aero
Digest*, circa 1948.
Also published in
Aviation Week,
January 26, 1948



THE PLANT OF DOMAN HELICOPTERS, INC., IN DANBURY.

The company moved to Danbury, Connecticut, in October 1948

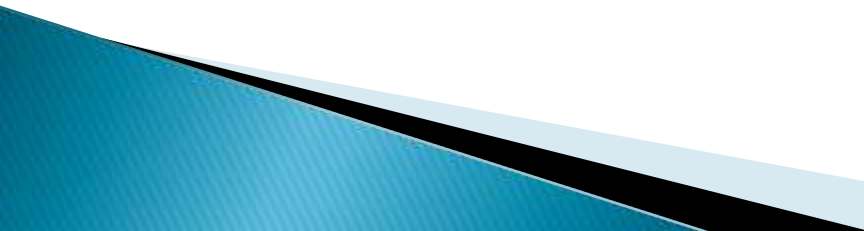


THE LZ-4 (CW-40)

The Curtiss-Wright Years
1949-51

Doman Helicopters entered into a partnership with the Curtis–Wright Corporation, at the time one of the preeminent companies in the aviation industry. The result was the first Doman helicopter designed and built from scratch, the LZ-4, also known as the CW-40.

One helicopter was built and test flown but never went into production. Many of its design features were later incorporated into the Doman LZ-5.





LZ4/CW40



Glid Doman, showing interior capacity of the LZ 4.
Published in *Aviation Week*, January 7, 1952



THE LZ-5

(ARMY YH-31)

1951-1960+

After Curtis–Wright terminated the LZ–4 arrangement, Doman designed a new model, the LZ–5, also called the YH–31 (the U.S. Army designation).

Three LZ–5s were built, flight tested and FAA certificated.

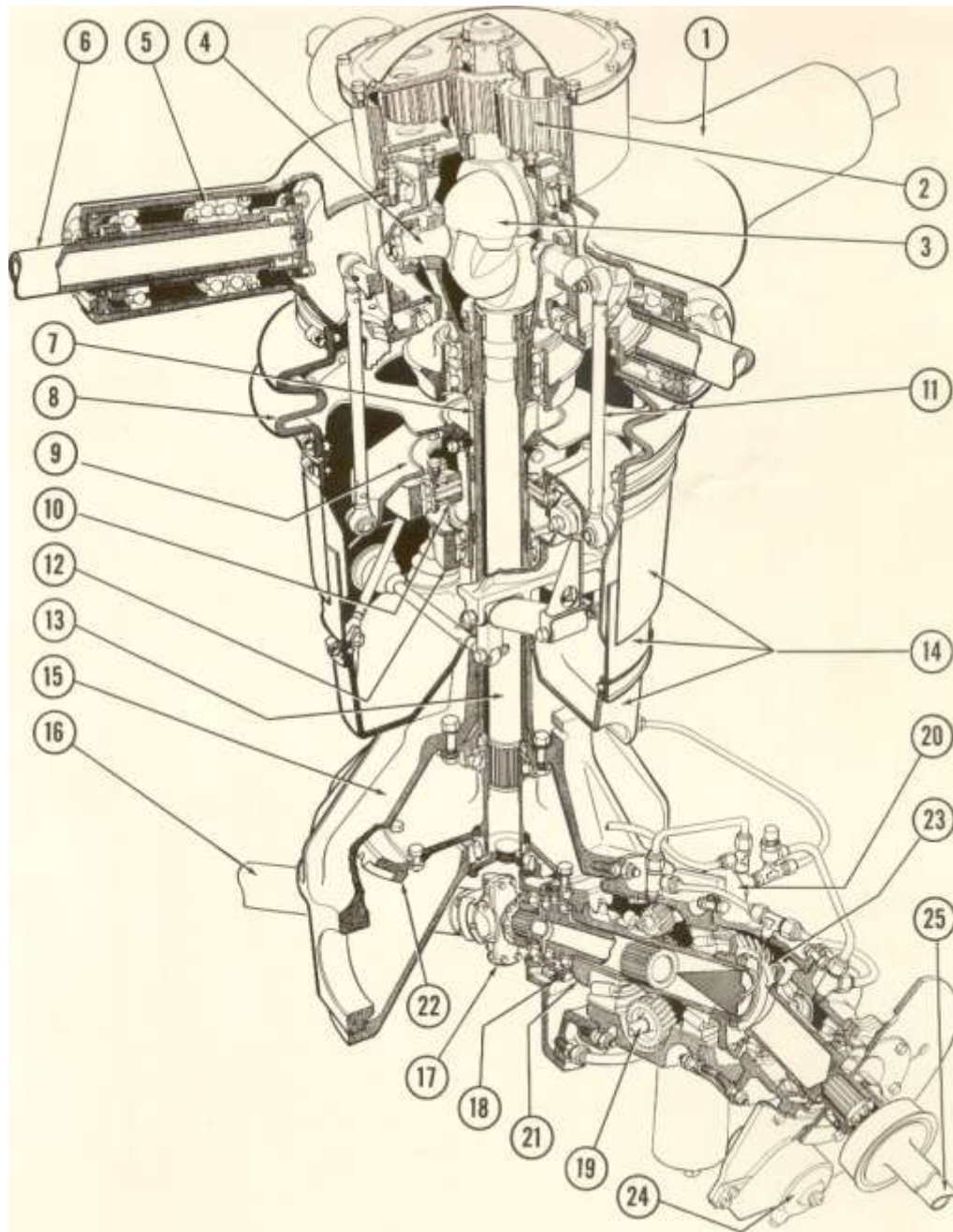




LZ-5 mockup with stretchers for showing to U.S. Army Medical Corps.
Picture and article published in Aviation Week, January 7, 1952

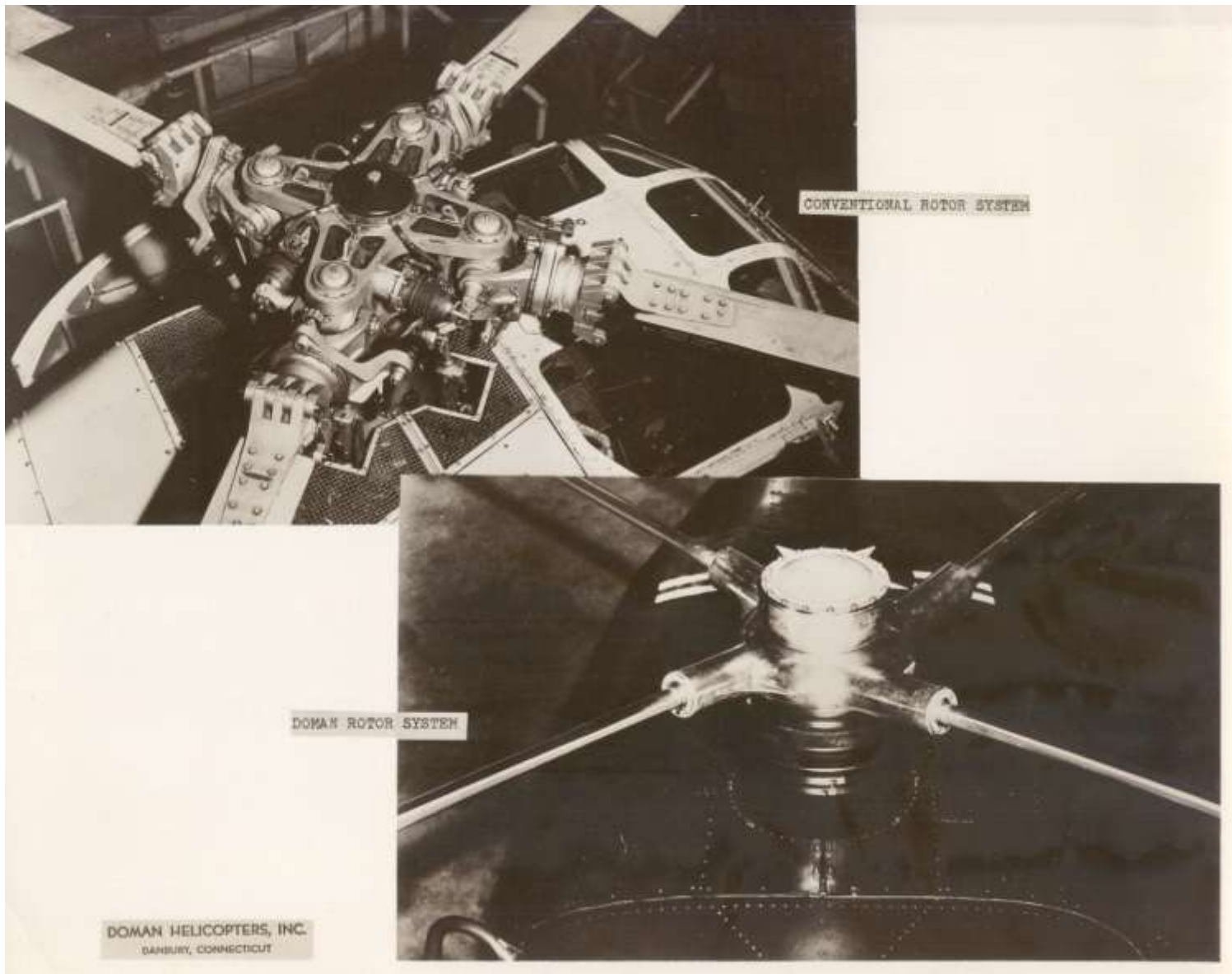


LZ-5 mockup in a New York Department store



Cutaway drawing of
LZ-5 rotor head
assembly before
adopting the servo
system that was
built into
the swash plate.

Published in
Aviation Week,
March 9, 1953



Another rotor comparison (much later) – The complex Sikorsky S-58 versus the simpler Doman LZ-5



First flight with eight people aboard, LZ-5



LZ-5 ships #1 and #2 - Only photo of both ships together



Doman Employees who had been present at the Army contract signing, line up to see LZ-5 Ship 1 depart on its delivery flight to Fort Rucker, Alabama, for Army testing



LZ-5 on Pentagon stopover on the way to Fort Rucker –
General Paul Yount, Chief of Army Transportation takes a ride. He
championed Doman technology for years

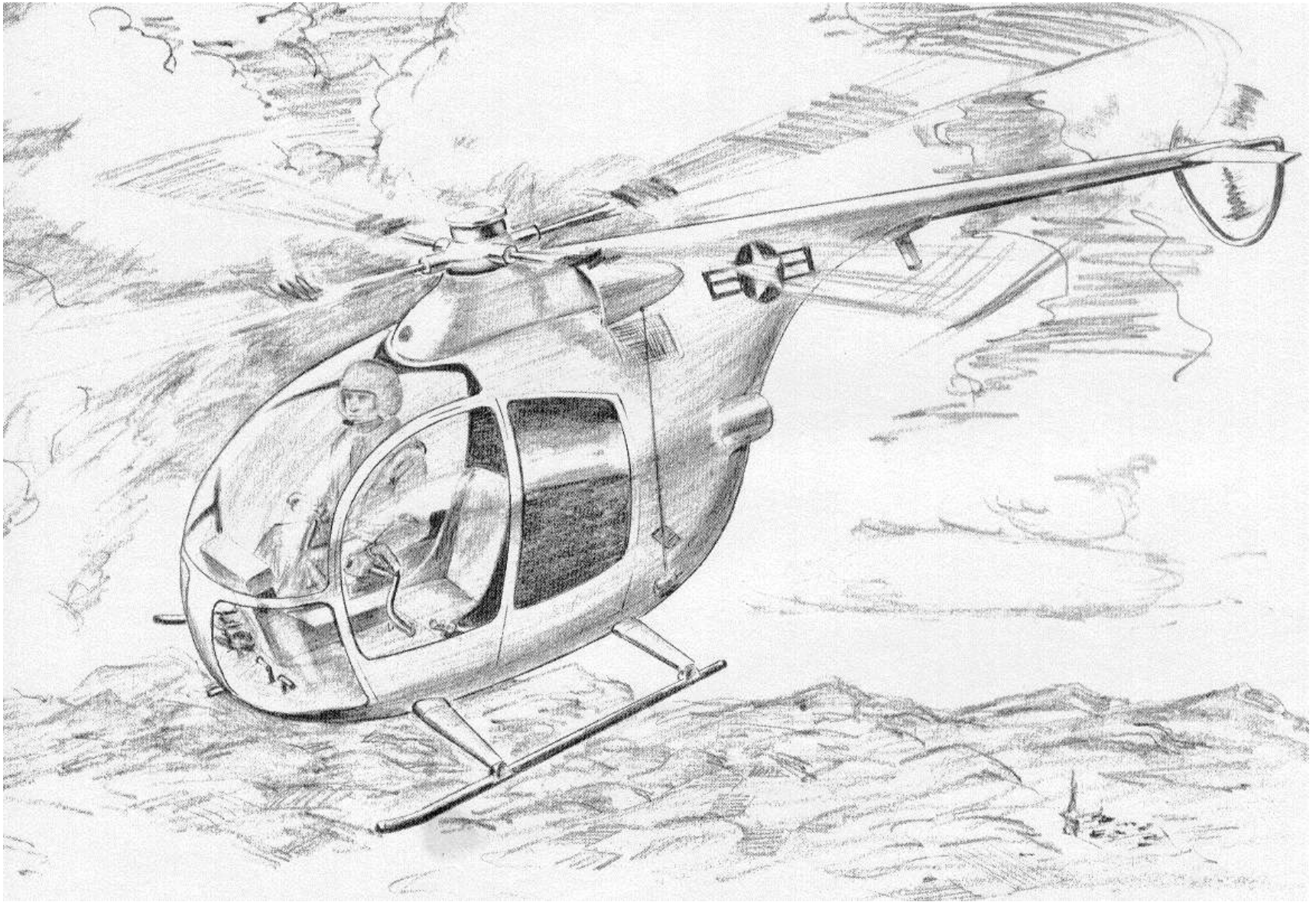


Doman Helicopters hosts an American Helicopter Society banquet in a Danbury, CT, hotel, in 1953. Joan Doman (wife of Glid) seated on the speaker's right. Igor Sikorsky seated on her right



Another Doman-Sponsored American Helicopter Society dinner with the legendary Anton Flettner showing movies of his helicopters in production two years before Sikorsky. This side of Flettner is Commander Frank Erickson, noted pioneer in the use helicopters for rescue

Army General Paul Yount sought to maintain the Doman work by funding research on a light observation helicopter (LOH), including preliminary design work and spec writing for the LOH.



Kaiser-Fleetwings KD-161 Doman and (Henry J.) Kaiser Fleetwings Corp. entered this design in the Army LOH contest

Doman-Fleet, Ltd: 1954 – 1957

Seeking a way around U.S. Air Force obstacles, Doman teamed up with Fleet Manufacturing Ltd., a major Canadian aviation firm based in Ft. Erie, Ontario.

Pursuing both military and commercial business, Doman-Fleet built a third LZ-5 in Ontario. It was simultaneously FAA certificated in the U.S. and certificated in Canada on December 30, 1955.





LZ-5 ship 3 (with Canadian registration CF-IBG) was demonstrated in Toronto, Montreal, and Quebec. This may have been the first helicopter ever built in Canada. If not, it must have been close to the first



LZ-5 Ship 3 hauling a Volkswagen convertible In Danbury, CT

LZ-5 Phase 4: 1957 – 1969

**Seeking Commercial and
Foreign Business**



Fleet itself hit financial setbacks that ended the Doman collaboration in 1957.

Doman began seeking contingent contracts with commercial buyers and pursuing a joint venture in Italy and later Puerto Rico. It also diversified beyond helicopters, adapting to keep the doors open.





LZ-5 ship 3 at Paris air show, 1960. (This is the same aircraft that had been registered in Canada as CF-IBG. By 1960 it was owned by Doman Helicopters and was re-registered in U.S. as N812)



Angelo Ambrosini news conference in Palermo, Sicily, Italy, in 1961, announcing plans to produce the LZ-5 in Sicily. Ambrosini was one of world's first aero engineers, schooled in Paris with Igor Sikorsky

Unable to raise sufficient capital to put into production the LZ-5 or one of its later proposed variants, Doman Helicopters was forced to close in December, 1969, after 24 years of pioneering.

Glid Doman went to work for the Boeing Vertol Helicopter Company, on the design of rotors for the “Heavy Lift Helicopter” and other rotor research.



AFTER HELICOPTERS

After 30 years in the
helicopter world,
Glid Doman turned his
rotor knowledge from flight
to wind energy in 1974,
with breakthrough concepts in
wind turbine design.



For some 30 more years, he led the design evolution of wind turbines for major manufacturers on two continents, including United Technologies, Boeing, and Aeritalia.



In 2010, at the age of 89,
he lives in
Granby, Connecticut
and is still innovating.

