Biographical Sketch of Malcolm Swinbanks

Dr . Malcolm Swinbanks has worked for 23 years as an engineering consultant through his U.K. company, MAS Research Ltd. (Mathematical & Scientific Research) and, more recently, as Chief Scientist to Vibration & Sound Solutions Ltd. of Alexandria, Virginia. Encouraged to study applied mathematics, he gained 1st class honors at Trinity College, Cambridge, in 1970, before taking his Ph.D. under Professor Sir James Lighthill, one of the foremost applied mathematicians of the 20th century.

He addressed theoretically the control of distributed parameter systems, focusing on fluid mechanics and wave propagation, and in 1972 filed his first patent on active control of sound propagation in ducts.

To broaden his skills in practical engineering, he worked as Marine Consultant Engineer for YARD Ltd. (Yarrows Admiralty Research Department). Yarrows was a Scottish shipbuilder whose founder, Sir Alfred Yarrow, gave the first graphic demonstration of vibration cancellation in a torpedo boat, in 1892.

While he was addressing vibration isolation in naval ships, the National Research Development Corporation took up his patent, funding development of the first industrial active gas turbine exhaust silencer at Duxford, near Cambridge. Dr. Swinbanks returned to Cambridge University to lead this project successfully from 1979-1981, as Consultant to Topexpress Ltd.

He established MAS Research Ltd. to provide consultancy to the UK marine and aerospace industries. Rolls-Royce Aero Engines invited him to participate in their program for Active Control of Compressor Surge and Stall, resulting in the first successful demonstrations on a Viper jet engine in 1991. He worked for Douglas Aircraft and GEC Avionics on active silencing for propeller noise in aircraft cabins, and from 1990 collaborated with GEC Marconi Research on Project M, an offshore DARPA research program in active vibration control.

In 1995, the U.S. Congress requested that this project transfer to the United States. Vibration & Sound Solutions Limited (VSSL) was formed to provide the focus, and the work was successfully transitioned, leading to a one-quarter-scale demonstration of a large-scale machinery installation in 2000. Subsequently, the Office of Naval Research asked VSSL to investigate potential application to mitigating shock for occupants of high-speed vessels. Present R&D is focused on bringing active and passive techniques to fruition in this context.

Dr. Swinbanks is inventor of fifteen patents, with three pending.

GEORGIA INSTITUTE OF TECHNOLOGY
George W. Woodruff School of Mechanical Engineering
Atlanta, Georgia 30332-0405

(404) 894-3200
information@me.gatech.edu
www.me.gatech.edu

The George W. Woodruff School of Mechanical Engineering Presents the Tenth Annual

Harold W. Gegenheimer Lecture on Innovation

Thursday
November 4, 2004
3:30 P.M.
Van Leer (ECE) Auditorium

Georgia Institute of Technology

Gegenheimer

Lecture Synopsis

From Mathematics to High-Speed Boats –
A Shock to the System

The techniques of Active Control applied to high speed dynamical processes – Sound, Vibration, Combustion, Compressor Instability and Shock - have brought the author into contact with a wide range of engineering research and development areas. This has provided first hand experience of the overall process of invention, theoretical analysis, subsequent numerical and experimental validation, through to industrial application.

There are many factors that influence this process. While the statement "necessity is the mother of invention" may frequently be accurate, much innovation is initially motivated by curiosity, and a desire to establish what is achievable. Often, the consistent obstacle to progress is an intellectual barrier, which causes people to believe that the best has already been achieved. Removal of this barrier, and demonstration that there is opportunity beyond, can trigger developments in a manner that might never have been initially envisaged. Ultimately there may be changes of direction, but this does not detract from the fact that without the initial innovation, such routes would never have been pursued.

Illustrations of this process will be given, ranging from low speed ventilation ducts to high speed aero engine compressors, from vigorously vibrating ships to stealthy submarines, from actively silenced aircraft interiors to the pounding ride of high speed navy craft in heavy seas. In the latter context, the severity can result in physical injury, and the mechanics of such injuries must be considered.

The areas of technological improvement that have opened up these opportunities are multi-faceted, and demonstrate the extent to which engineering research and development can provide a challenging, wide ranging, and ultimately stimulating career.

Program

Introduction	Dr. Ward O. Winer Eugene C. Gwaltney, Jr. Chair of the Woodruff School of Mechanical Engineering
Lecture	Dr. Malcolm Swinbanks Chief Scientist, Vibration and Sound Solutions, Ltd.
Question-and-Answer Session	Drs. Swinbanks and Winer
Concluding Remarks	Dr. Winer

Please join us after the lecture for a reception on the 2nd floor of the J. Erskine Love, Jr. Manufacturing Building.

Georgia Tech

Biographical Sketch of Harold W. Gegenheimer (BME 1933)

Harold W. Gegenheimer has been associated with the printing industry all his life: As a machinist, machine design engineer, inventor, product development manager, and corporate chief executive. He is the Chairman Emeritus of the Baldwin Technology Company, an international manufacturer of material handling, press accessory, and prepress equipment for offset printing.

His father, William, started the Baldwin Company in 1918 in a small building next to their house in Baldwin (Long Island), New York. He invented the Baldwin Press Washer and the company emerged as a manufacturer of printing press accessories and controls.

Harold always took an interest in things mechanical, so it was natural that he came to Georgia Tech, where he received his bachelor's degree in mechanical engineering in 1933. Later, he invented the Convertible Offset Perfecting Press, a feature used by most press manufacturers, that allows for one or more colors to be printed on both sides of the paper with just one pass through the press. His inventions, for which many United States and foreign patents have been obtained, were keys to the great growth of the offset printing process after World War II.

Mr. Gegenheimer was President of the National Printing Equipment and Supply Association from 1977 to 1979. He has been an officer or director of other industry associations and the recipient of numerous technical and educational awards. In 1983 he was elected Graphic Arts Man of the Year. In 2003, he received the Harold Falk Distinguished Alumnus Award from Chi Psi fraternity for outstanding accomplishments.

Mr. Gegenheimer is a long-time contributor to Georgia Tech's *Thousand Club*, served as co-chair of his 50th Reunion Committee, and was the recipient of the 1996 Woodruff School Distinguished Alumnus Award.

An endowment given to the Woodruff School in 1995 by Mr. Gegenheimer established the Harold W. Gegenheimer Lecture Series on Innovation. His endowment supports student programs that encourage creativity, innovation, and design. Through the lecture series and support of capstone design projects, students are exposed to processes that stimulate creativity and lead to inventions and patents. As an inventor, Mr. Gegenheimer continues to express an interest in the great advances made at his alma mater through innovative programs that link industry with graduate and undergraduate studies. His endowment supports the School's display, *Patents of the Woodruff School Faculty*, which features Mr. Gegenheimer's twenty patents and 187 U. S. patents of current Woodruff School faculty.

Biographical Sketch of Harold W. Gegenheimer (BME 1933)

Harold W. Gegenheimer has been associated with the printing industry all his life: As a machinist, machine design engineer, inventor, product development manager, and corporate chief executive. He is the Chairman Emeritus of the Baldwin Technology Company, an international manufacturer of material handling, press accessory, and prepress equipment for offset printing.

His father, William, started the Baldwin Company in 1918 in a small building next to their house in Baldwin (Long Island), New York. He invented the Baldwin Press Washer and the company emerged as a manufacturer of printing press accessories and controls.

Harold always took an interest in things mechanical, so it was natural that he came to Georgia Tech, where he received his bachelor's degree in mechanical engineering in 1933. Later, he invented the Convertible Offset Perfecting Press, a feature used by most press manufacturers, that allows for one or more colors to be printed on both sides of the paper with just one pass through the press. His inventions, for which many United States and foreign patents have been obtained, were keys to the great growth of the offset printing process after World War II.

Mr. Gegenheimer was President of the National Printing Equipment and Supply Association from 1977 to 1979. He has been an officer or director of other industry associations and the recipient of numerous technical and educational awards. In 1983 he was elected Graphic Arts Man of the Year. In 2003, he received the Harold Falk Distinguished Alumnus Award from Chi Psi fraternity for outstanding accomplishments.

Mr. Gegenheimer is a long-time contributor to Georgia Tech's *Thousand Club*, served as co-chair of his 50th Reunion Committee, and was the recipient of the 1996 Woodruff School Distinguished Alumnus Award.

An endowment given to the Woodruff School in 1995 by Mr. Gegenheimer established the Harold W. Gegenheimer Lecture Series on Innovation. His endowment supports student programs that encourage creativity, innovation, and design. Through the lecture series and support of capstone design projects, students are exposed to processes that stimulate creativity and lead to inventions and patents. As an inventor, Mr. Gegenheimer continues to express an interest in the great advances made at his alma mater through innovative programs that link industry with graduate and undergraduate studies. His endowment supports the School's display, *Patents of the Woodruff School Faculty*, which features Mr. Gegenheimer's twenty patents and 187 U. S. patents of current Woodruff School faculty.