Kaman Corporation

An American Story

CHARLES H. KAMAN

"Were American Newcomen to do naught else, our work is well done if we succeed in sharing with America a strengthened inspiration to continue the struggle towards a nobler Civilization— through wider knowledge and understanding of the hopes, ambitions, and deeds of leaders in the past who have upheld Civilization's material progress. As we look backward, let us look forward."

—CHARLES PENROSE
(1886-1958)
Senior Vice-President for North America
The Newcomen Society
for the study of the history of
Engineering and Technology
(1923-1957)
Chairman for North America
(1958)

This statement, crystallizing a broad purpose of the Society, was first read at the Newcomen Meeting at New York World's Fair on August 5, 1939, when American Newcomen were guests of The British Government.

"Actorum Memores simul affectamus Agenda"

This address, dealing with the history of the Kaman Corporation, was delivered at a "1983 Connecticut Meeting" of The Newcomen Society of the United States held at Mystic Seaport, when Mr. Charles H. Kaman was the guest of honor and speaker on August 5th, 1983.

"The dedication of our people is the root cause of the growth of the company. Kaman encourages a special blend of entrepreneurial spirit limited only by broad corporate policies."

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MEMBER, THE NEWCOMEN SOCIETY

PRESIDENT AND CHIEF EXECUTIVE OFFICER

KAMAN CORPORATION

BLOOMFIELD, CONNECTICUT

THE NEWCOMEN SOCIETY OF THE UNITED STATES

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INTRODUCTION OF MR. KAMAN, AT MYSTIC SEAPORT, ON AUGUST 5TH, 1983, BY MR. CARLYLE F. BARNES, CHAIRMAN OF THE EXECUTIVE COMMITTEE OF BARNES GROUP INC., BRISTOL, CONNECTICUT; CHAIRMAN OF THE CONNECTICUT COMMITTEE IN THE NEWCOMEN SOCIETY OF THE UNITED STATES

Fellow members of Newcomen and guests:

THE gentleman I am about to introduce is a unique individual, a man with insight, patience, stick-to-itiveness and dedication, among other attributes. As president and founder of Kaman Corporation, Charles H. Kaman has built his company since 1945 into an organization now doing half a billion dollars a year in five different market groups—aerospace, sciences, bearings distribution, musical instrument manufacturing and distribution, and aviation services.

No one builds a fine organization without concern for people, and Charlie's capacity to help others extends far afield from his company's endeavors. Presently he is a director and corporator of the Institute of Living, and founder and director of the Fidelco Guide Dog Foundation, Inc. For the past twenty years he and his wife Robbie have directed a selected breeding program to develop a line of German shepherds that are free from hip dysplasia and of stable temperament. Two years ago the Fidelco Foundation expanded its work to include the actual training and placement of guide dogs with blind individuals.

Some of his past affiliations include being a trustee of Western New England College, an associate of the University of Connecticut School of Engineering, a founder of the University of Hartford, a member of the Board of Advisors of RPI Hartford Graduate Center, and a member of the Board of Governors of The Catholic University of America in Washington D.C. from which he was graduated in 1940 with a bachelor's degree in aeronautical engineering.

In the business world, Charlie's affiliations and honors are many, ranging from the Outstanding Man of the Year Award from the Hartford Jaycees in 1948 to the Dr. Alexander Klemin Award of the American Helicopter Society in 1981. He presently serves on the boards of directors of the Hartford National Corporation, the Con-

necticut National Bank, the Security Connecticut Insurance Company and Emhart Corporation.

With all this, Charlie still finds time once in a while to work around his lovely home in Farmington and play his guitar.

It gives me a great deal of pleasure to present to you CHARLES H. KAMAN.

Fellow members of Newcomen and guests:

I AM extremely honored to be with you. That The Newcomen Society would select our company for such recognition truly belongs to all the people of Kaman. I'm very proud of the company, as you will readily perceive. But although I started it and am still there, the real story of Kaman is the story of the dedication of all of its people. It is the story of a business and social structure having its foundations in basic human needs—the need for recognition as an individual; the need to accomplish; and the need for leadership. This is also an American story because we are a nation which still possesses the most of that precious commodity known as freedom.

Kaman Corporation Today

Over a period of just thirty-six years, Kaman people have built a diversified, successful company. Although we started life in 1945 to build "every man's" helicopter and we are again building helicopters for the Navy, it is interesting to consider the ranges of technologies in which we are now involved. We have instrumentation at the Nevada underground test site for nuclear weapons which measure, with the highest level of today's electronic sophistication, nanoseconds—billionths of a second—while at the same time we pump fuel into a commercial jet. We use carbon graphite, derived from palm tree fibres, to make helicopter rotor blades while using the same carbon graphite to make "rock" guitars. We sell products which range from a 50¢ O-ring to a $9 million helicopter. We have manufactured liquid sodium pumps for nuclear reactors, at the ultimate level of technology, while at the same time providing hosing and water pumps for irrigation ditches in Arizona. We seek an export license to deliver a sophisticated mechanical coupling in Europe, while we sell musical instruments in South America and Australia. Today we look forward to our fifteenth year of increased earnings and half a billion dollars in revenues. "How could you do this; you didn't have any background for this?" a financial analyst asked me. "You're absolutely right," I replied. "The fact is, I didn't do it—the people in the company did it."

CHARLES H. KAMAN, PRESIDENT AND CHIEF EXECUTIVE OFFICER

This all started in the spring of 1943, when I stood in the marshlands of Stratford, Connecticut, and watched the Sikorsky helicopter, the VS300, hover and maneuver. The early virtues of helicopter flight, however, were fraught with many difficulties. Power was insufficient to provide a reasonable payload. Instability made control and flight difficult and tedious. Mechanical design experience to assure reasonable component working life was nonexistent. Bearings, for example, were a major problem.

I was employed at Hamilton Standard Division of United Aircraft Corporation as an aerodynamicist. But despite long hours in a war economy, I started out on my own time to solve these problems. I used as a business base the name Kaman Aircraft Laboratory. This form of organization permitted the War Production Board to grant priorities so that materials could be bought to build a test rotor and rig to prove a radical new concept of aerodynamic servo-control for flight handling stability. However, when a working model was demonstrated to the vice president and general manager of Hamilton Standard, the answer was, "We have our inventor—Igor—we don't need another."

I visited with Frank Caldwell, then director of research for United Aircraft and the inventor of the controllable pitch propeller for airplanes. The visit was to discuss the merits of quitting and going into business. "Charlie, you probably think that your venture depends upon how good the engineering of your servo-flap control is." "Yes, of course," I replied. "Well," continued Frank, "it probably depends more on your ability to take a continual beating and continue to function with good judgment."

Those words would ring true over and over in the years that followed.

I left Hamilton Standard and founded Kaman Aircraft Corporation on December 12, 1945. I had $2,000 in cash from two investors and $5,000 worth of Kaman Laboratory equipment which consisted of a rotor, a rig and some small shop equipment.

The community of helicopter pioneers in America was a small one. Following Igor Sikorsky was Frank Piasecki in Philadelphia with his

PV forum. Years later his company became Vertol, a division of Boeing, but Frank had departed. At about this same period in the early '40s came Stanley Hiller on the West Coast. After World War II, Stan sold to Autolite, which later sold to Fairchild. Stan also left and Fairchild later ceased helicopter operations. Larry Bell became enamored with the concept of commercial helicopters and launched the Bell effort in the early '40s. Bell is one of the majors in helicopters today, is located in Dallas-Fort Worth, Texas, and is a division of Textron. Then there was Kaman and a host of others.

There have been many companies started with the dream of building "every man's" helicopter. Others went exclusively for military types. This included large companies, such as McDonald Aviation, Lockheed, Cessna and Hughes. Of the large company group, only Hughes remains. Of all of the others, only Sikorsky, Bell, Vertol and Kaman are still producing helicopters. And, as Father Time relentlessly takes his toll, I realize that I am the only original pioneer still active in helicopters today.

At an early date it became evident to Kaman Aircraft that the extensive Civil Aeronautics Authority (CAA), now the Civil Aeronautics Board (CAB), flight regulations, both in design and in operations, precluded the original dream of "every man's" helicopter. The reason was simply one of cost. There was a brief love affair with crop dusting, foreign sales and other attempts to stay alive because, in the wake of World War II, there was practically no military support.

Eventually military interests reawakened and Navy support for the engineering of the new Kaman effort became significant. From 1945 until 1949, the company had existed on the sale of its stock and in the leasing of a few of its first K-225 crop duster helicopters. The secret to staying alive was the ability to "barnstorm" each Sunday at Bradley Field in Windsor Locks, Connecticut, to entice the Sunday viewers into becoming investors. Along the way, there were periods of such financial destitution as to make us think that each week would be the last, and this went on for some years. I tell many young people that to attain success in one's chosen field one must be willing to live in a state of total insecurity.

In 1948, the Navy, having bought two of the early K-225 crop dusters, conducted a thorough flight evaluation. The results convinced the Navy Bureau of Aeronautics that the new aerodynamic principles

KAMAN K-225 HELICOPTER

employed by the aerodynamic servo-flap rotor control and intermeshing twin-rotor "syncropter" configuration were breakthroughs. The Bureau set the company up to function as one of its engineering research facilities for the development of new concepts and technical achievements in a rapidly burgeoning state of the art. For example, the Navy financed moving from the old National Guard hangar at Bradley to a new facility in Bloomfield, Connecticut, gave the company the opportunity to compete for new production contracts, in which we were successful, and continued its support for the technological developments of the company. Outstanding engineering achievements by Kaman Aircraft Corporation then began to multiply. The company produced the world's first turbine-powered helicopter and twin-turbine-powered helicopter, the world's first full scale remote-controlled pilotless helicopter, and the first U.S. helicopter powered by a turbine engine driving an air compressor which supplied air through a piping system to nozzles at the rotor blade tips. The visibility and prosperity

of the company increased. It continued to win design competitions and its facilities grew rapidly. By the early 1960s, sales had grown to over $70 million and the company had several models in production simultaneously.

In October 1961, a Kaman HH-43B helicopter set a world's altitude record for helicopters with a flight to 32,279 feet and three world's time-of-climb records to 3,000 meters, 6,000 meters and 9,000 meters.

Rotary wing technology ushered in a new and higher level of structural dynamics and fatigue stress analysis which truly extended in a significant manner the design concepts of all aircraft. While airplane designers have long sought to have reliable engines which are subject to fatigue type stresses, the science of the rotary wing brought to the forefront the necessity of dealing with multiple origins of fatigue loads. These are loads that vibrate at any variety of frequencies causing premature failure at but a fraction of the capability of the part under a simple steady load. The rotary wing operates continually in an extremely asymmetric field of aerodynamic and dynamic forces, each of which sets up various degrees of resonances and vibrations that are simply mind-boggling in scope and multiplicity. It is small wonder that engineering dominated the development of today's helicopters and that such an environment would lead unavoidably to a high cost product.

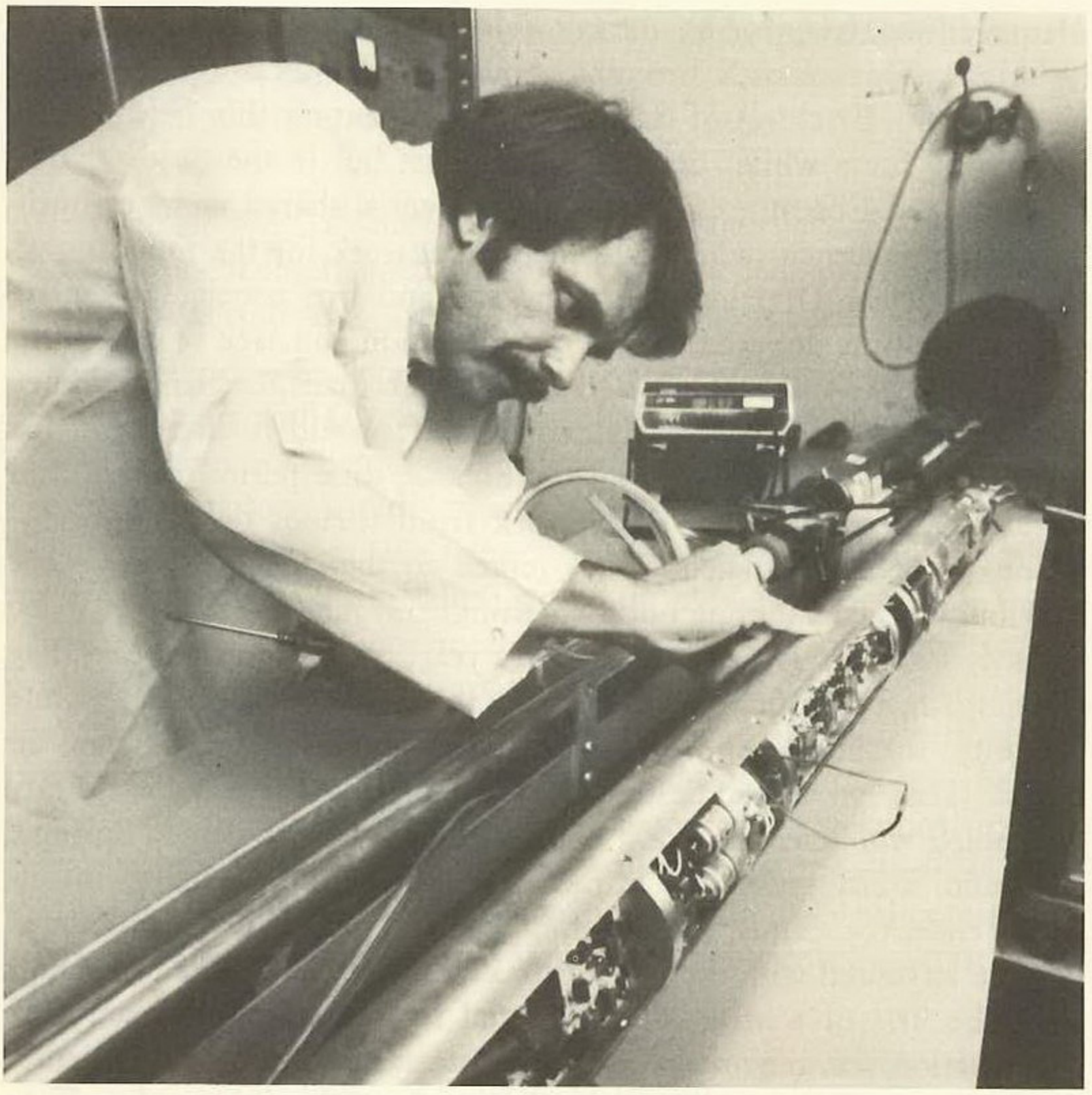
It is difficult to describe the sense of accomplishment which comes to all the people participating in the formulation of a new enterprise in a highly technical field of endeavor. That this has happened so often and still continues to happen is, after all, one of the greatest tributes to the American way of life. The conquest of the air in rotary wing was a field of almost unprecedented technical challenge and opportunity. I was blessed to have been there early and to remain involved to this day.

The Beginning of Diversification
The Kaman Nuclear Division

During the early '50s, the company undertook a contract with the Sandia Corporation of Albuquerque, New Mexico, to develop a rotochute device which would be designed to retard the descent speed of a nuclear device, particularly from the point of view of providing

adequate time delay for an aircraft delivering such a device to escape its effect. This was all brought about by an association with Dr. Kenneth W. Erickson of Sandia. Development in this field, while continuing for a while, did not materialize; but in the process, Dr. Erickson and I became extremely close friends, shared views of business accomplishment which laid the groundwork for the founding of Kaman Nuclear Division. Dr. Erickson and five associate scientists were at the time angered by the regimentation and lack of flexibility and management policies of Bell Labs which managed Sandia. They left on the speculation that Kaman Aircraft would finance them for their first year of endeavor and within that time period they would have to achieve sufficient study work from various defense organizations to be self-sufficient. They rented an abandoned grocery store in Albuquerque and hung out their shingle on January 1, 1957. They not only became self-sufficient within a year, but within two years they had outgrown their quarters to the point that a home became an absolute necessity. By then, there were some forty scientists and technicians on board. They were not destined to remain in Albuquerque, a city flourishing with scientific work, but rather to move to Colorado Springs, Colorado, a city seeking to attract new industry, particularly in scientific endeavor. Thus, the fledgling Kaman Nuclear Division moved in June 1959 and with the help of the city fathers in Colorado Springs built the first of a series of substantial structures there. Later, the organization was renamed Kaman Sciences Corporation and recently the instrumentation and hardware side of the business split off to become Kaman Instrumentation Corporation. Today the combined enterprise exceeds $46 million in annual revenues, employs forty-seven Ph.D.s, over 750 people, and occupies a seventy-six acre complex.

A little known fact is that the Kaman Nuclear Division was involved in the 1962 Pacific nuclear weapons test series, "Operation Fishbowl." Dr. Frank Shelton was a chief technical representative of the Department of Defense and reported directly on guidance and policy issues to McGeorge Bundy, President Kennedy's National Security Advisor. The corporation is one of the largest subcontractors to the government on the underground nuclear tests being conducted in Nevada and has maintained a preeminent level of scientific endeavor associated with reliability, vulnerability and feasibility of all types of modern defense systems. Hardware enterprises arising from this work



KAMAN SCIENCES CORPORATION/KAMAN INSTRUMENTATION CORPORATION BOREHOLE NEUTRON GENERATOR

extend from early warning devices in nuclear reactor powerplants to minute strands of cable capable of surviving under the most hostile of environments. The Sciences corporation, being an early user of massive computer facilities, was also destined to offer its computer services to others. KBS, a computer software service, is offered commercially by the Sciences company to radio and TV stations throughout the country to assist in programming, billing and all phases of management control. Another example of the products that have come from this scientific endeavor is a material known as K-ramic® ceramic which treats alumina/silica chemically with close to absolutely zero dimensional alteration to achieve a hardness approximately equivalent to carbide steel. Applications are widespread for such a radical new chemical innovation as might be expected. Other ventures involve the

peaceful use of nuclear devices such as the bore hole neutron generator, ideal for substrata analysis in the continuing quest for petroleum products.

The Start of AirKaman

During the early years of Kaman Aircraft, stockholder meetings were frequented by a hardy band of enthusiasts who, having invested their savings, were bound and determined to insure that the company fulfilled every man's dream of owning a helicopter. Stockholders' meetings became an opportunity for a free exchange of enthusiastic ideas all of which had in common the imbalance of enthusiasm over reality. At the time we frequently got the question from stockholders, "When are you going to build a commercial helicopter?" At last the directors decided that the company should seek to acquire experience in a commercial aviation field.

At about this time, the company had a need for an airplane because there were a great number of folks traveling back and forth to Patuxent River Naval Test Center in Maryland and Washington, D.C. to visit with the Navy. We engaged a young pilot who was then flying as a co-pilot with Monsanto Chemical and I visited folks in the Connecticut State Aeronautical Commission to set up an operation at Bradley Field. That operation quickly became AirKaman, Inc. and was later expanded considerably and continues today as AirKaman of Jacksonville, Inc. in Florida. Business flourished for a few years, but eventually a variety of problems overtook the enterprise to the extent that it did not go forward as other Kaman endeavors had. At its peak, there were four units, AirKaman, Inc. at Bradley International in Connecticut, AirKaman of Westover (Massachusetts), AirKaman of Omaha (Nebraska) and AirKaman of Jacksonville. The first three of these were sold in 1982, but Jacksonville continues since the company is expanding many of its operations in that area giving rise to multiple interests in maintaining the activities there.

Adversity Rears Its Ugly Head

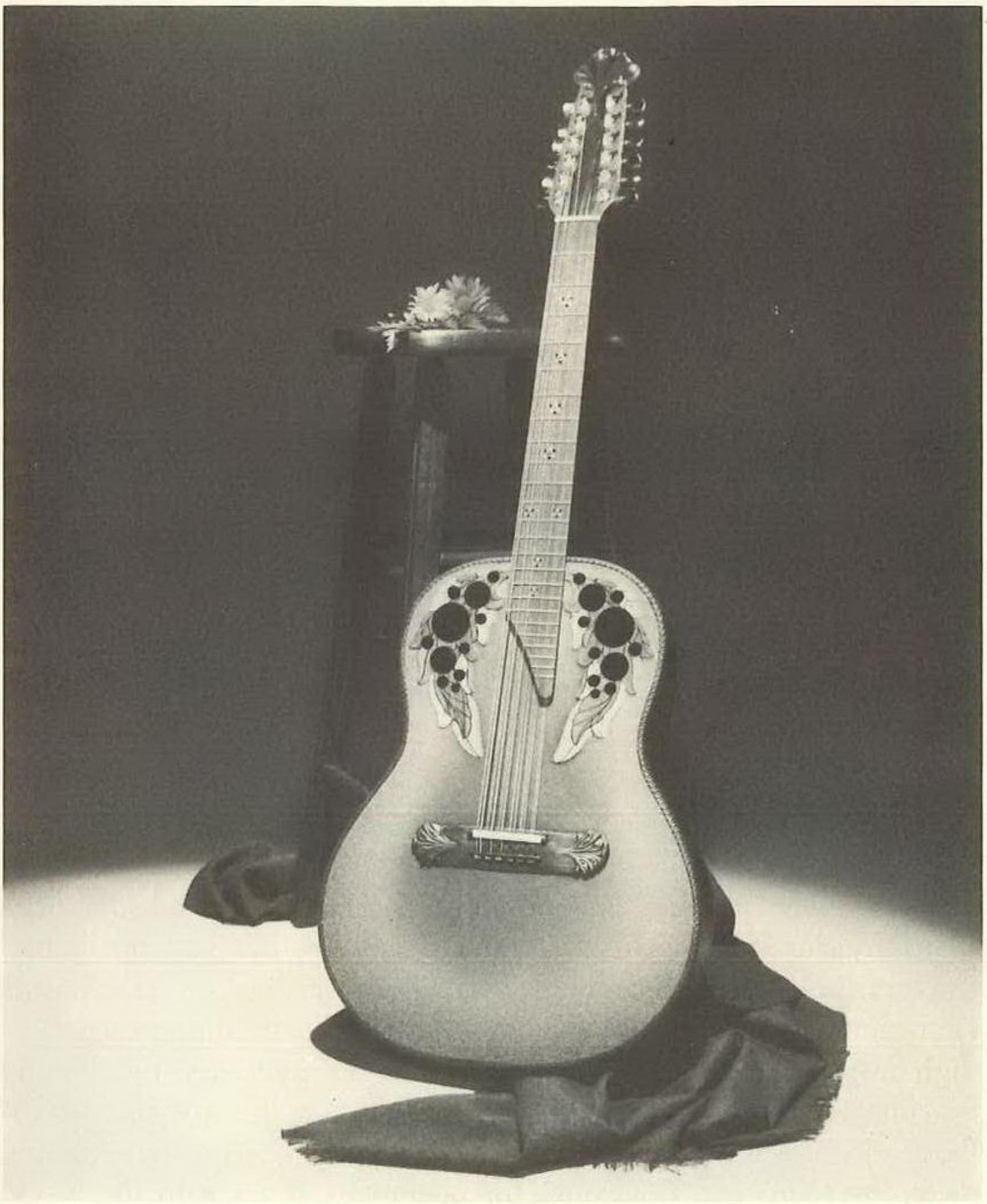
When John F. Kennedy took office as President of the United States in 1961, it was just a matter of hours before he directed his new Secretary of Defense to seize control of all military and defense pro-

curement from the individual services. The new Secretary accomplished this within thirty days and ushered in the new concepts of a "Total Package Procurement Plan" and "Cost Effectiveness Analyses." Time now tells us that there were few successful military procurements started during his years in office as Secretary of Defense. That doesn't alter the fact that companies such as Kaman Aircraft were driven straight to the wall. At the time, Kaman was producing a rescue HU-2 helicopter for the Navy with the unbelievable navigation capabilities of proceeding 200 miles to sea at night in an ice storm unaided by any external means of navigation, picking up eleven people from the ocean, and then proceeding some 200 miles to a new destination, still unaided by any external source of navigation. This aircraft represented the highest level of helicopter technology of its era and, as a result, was also expensive. The Navy was unable to respond to the analytical question from the Department of Defense, "How many lives will the Navy be *unable* to save if it doesn't have this expensive procurement?" The very successful H-2 program with the Navy was literally stopped in its tracks in favor of forcing the Navy to use the Army's low cost "Huey." It would only be a year or two before experience would show that corrosion produced by conditions at sea would eliminate any capability of the "Huey" for the mission. But when the decision was made, Kaman had to face virtual extinction.

And Then Came Music

Squarely facing the problem of declining business in the Aircraft company, the directors felt that the company should diversify into other markets including the leisure time field and consumer markets. While it is true the company had no background in such consumer activities whatsoever, bearing in mind the manner in which the company had been started and had grown, it is unlikely that anyone would take exception to a business effort that would render growth and stability to the fledgling company. The things that were looked at included campers, fiberglass sailboats, camping gear, all types of athletic endeavor; but it was not until I visited the C. F. Martin Co. in Nazareth, Pennsylvania, that the answer became apparent. Having played the guitar as recreation for many years, an occasion found me at the Martin Company to have my guitar repaired. The neck was warped. At the time the Martin Guitar Company was regarded as the leading company

in the field. Mr. Fred Martin, president of the company, offered me a tour through the factory which I accepted, an unforgettable experience. Bear in mind that we had built rotor blades in the early years for the HTK and HOK helicopter for the Navy and Marines from sitka spruce. This is one of the materials used in the guitars, and, while we had held tolerances to 5/1000" with precision tooling and advanced wood working equipment, Martin guitars were being made with hammer and chisel and stuck together with animal glue. My



OVATION INSTRUMENTS, INC. ADAMAS GUITAR

instant response was that Kaman would have a great deal to contribute and I offered to buy the company from Mr. Martin. Being a family business, he courteously refused and after a second try later on at which time I explained we would enter the field and become the leader with our technology, he still refused.

With the aid of a materials laboratory, oscillographs, vibratory equipment and other pieces of technical equipment, we made a guitar with a rounded back and new top bracing that gave better sound. We called it the "Ovation" guitar. It was also much more durable. Indeed, in the years that have passed, the Ovation company has taken over approximately 75 percent of the U.S. manufactured acoustic guitar market and has become the world leader.

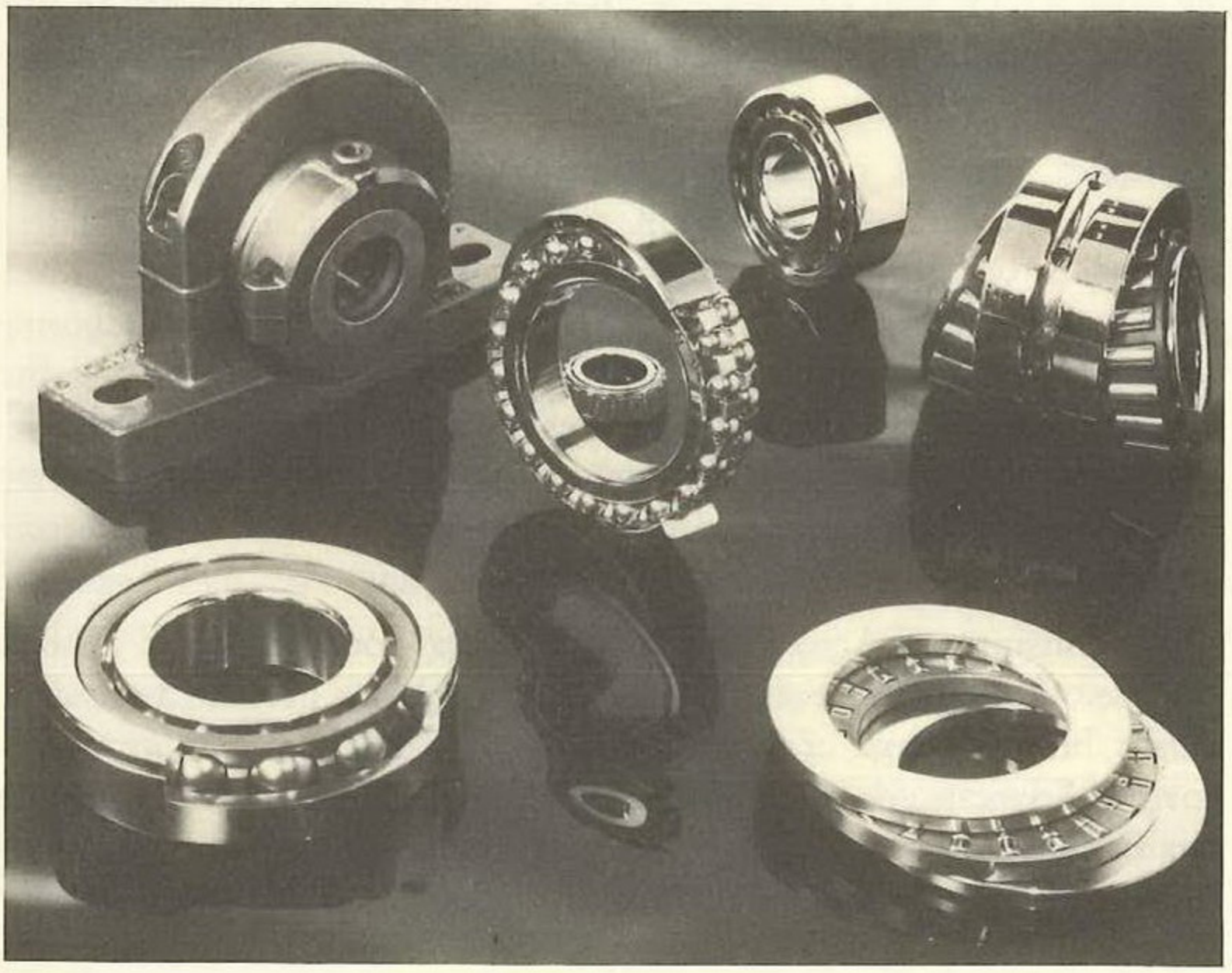
Introducing a guitar in the consumer market, however, very soon became a problem of merchandising, promotion and advertising, and it was readily apparent that we should expand our entry in the field. First came the acquisition of the two distribution companies, Coast Wholesale Music Co. of Los Angeles and Coast Wholesale Music Co. of San Francisco, followed by National Musical String and C. Bruno & Sons, Inc. While the manufacturing companies continue to manufacture guitars and strings, the distribution sector has become the largest distributor of musical instruments in the country and imports thousands of different types of instruments and equipment from all over the world to sell along with equipment manufactured by many other companies in the U.S. Of those original entrepreneurs who founded the companies that were acquired, some have retired while the rest are still with the company.

Bearing Manufacture and Distribution

In the early '70s the Kaman Aerospace Corporation had spun off a small division known as Ka-carb to manufacture bearings for its helicopters. Bearings in helicopters are extremely critical since the hostile environment from salt spray, dust and other factors superimposed on high fatigue stresses and heavy loads reduce normally well-functioning bearings to failure in fractional times. In the case of the Kaman servo-flap helicopter it was necessary to invent a new bearing to withstand these environmental conditions for operations at sea with the Navy. This effort has since become the Kamatics Corporation. Kamatics has

grown to take a very substantial place in the manufacture of special bearings for a great variety of technical and industrial applications ranging from hostile environments in jet engines, to airliners, to nuclear reactors. The company has expanded product lines to include power transmission couplings utilizing technology that has eliminated all moving parts and is moving forward with increasing speed to fulfill the demand for its ever-expanding family of products.

While this was going on, the company became aware of the after market in bearings and power transmissions. This market is very large in scope and has almost entirely sprung up since World War II. As the technology of industrial bearings and power transmissions grew requiring increasing technical support in the field, it exceeded that which manufacturers could practically offer. This distribution field held further attraction for the directors of the corporation because it offered participation in the industrial sector of the marketplace. A survey of the field on a national basis was undertaken for a period of one year, after which the company made rapid acquisitions in California, in the Rocky Mountain region and in the Northwest, followed



SOME OF THE PRODUCTS DISTRIBUTED BY KAMAN BEARING AND SUPPLY CORPORATION

by many other acquisitions. Collectively this brought our activity to a national level. In the space of ten years beginning in 1971, this enterprise has grown to become the third largest distributor of bearings and power transmissions in the country and prides itself on having established a level of consumer service and technical support second to none. The business is expanding rapidly and Kaman's preeminence in the field is expected to continue, particularly in those geographic areas where we are not as yet present. This organization, not unlike that in the music distribution side, distributes over 50,000 different components including replacement bearings, chains, gear reducers, couplings, sprockets, v-belts, pulleys, conveyor idlers, hydraulic and electrical components, lubricated seals and so on; in summary every-thing needed to keep the wheels of industry turning. Once again this is the ideal environment for computer controlled management and operational computer methods.

The strategy of diversification into three equal sectors of defense, industrial and consumer markets gained in its appeal with the directors. Within a very few years, by 1975, the company had achieved a split of 31%, 35.9% and 33.1% respectively. Actually this consisted of five major groups later on identified as bearings, aerospace, sciences, music and aviation services.

Aerospace Again

Now, if I may, back to the Aerospace company. As you all very well know, business is not always in a "plus" mode. In 1968 the company recognized substantial distress on a large contract with Lockheed for the fabrication of flaps and spoilers for the C-5A inter-theater transport. This same program later brought Lockheed to the Congress for a bailout loan guarantee to save the company.

The business of Aerospace at that time was concentrated in a small number of large contracts and the C-5 problem presented a major crisis. However, out of this experience came new contracting policies for the Aerospace company severely defining the kinds of business the company would seek. New policy prohibited any "buy-in" or speculative bidding of any kind. Aerospace would concentrate on subcontracts for prime aerospace contractors on both the defense and commercial sides, on things it knew and could do best, and it would search

out a broader range of customers. The reorganization and reorientation of the business of Aerospace has been successful and today the company is perhaps the least like its original structure of any Kaman company. From a minimum of $35 million in revenues in 1975 the company is approaching five times that level today. The diversification in music distribution, music manufacture and bearings and power transmission distribution already present permitted an orderly transition of the Aerospace company business so that by 1977 government business represented less than 20 percent of the revenues of the corporation.

Today Aerospace is a highly specialized competitor in diverse products for the extreme aerospace environment and in research and development. Examples of its products and services are helicopter rotors, movable wing assemblies, bearings and couplings, space material, composite structures and vibration measurement and control. These components go into the space shuttle, many military aircraft, including the A-6, A-10, F-14, C-5, B-1B, and in commercial airlines such as the Boeing 767, 747 and the Douglas DC-9-80. It's also great—and a sign of industry maturity—to be producing rotor components for Sikorsky's S-76 commercial helicopter and H-60 and H-53 military helicopters, and composite rotor blades for Bell's Cobra helicopter gunship.

The "Icing on the Cake," as characterized by a *Forbes* magazine article, came in 1981 when, after helicopter production had ceased for more than ten years, the Navy asked the company to reopen the production line for the Kaman SH-2F, the LAMPS Mark I anti-submarine warfare helicopter. There were many empty decks on our Navy's destroyers and frigates, world tensions were mounting, and IBM and Sikorsky's LAMPS Mark III would never cover all the decks of the fleet of destroyers and frigates in the Navy by reason of its size. The 1982 and 1983 defense budgets have provided 36 SH-2Fs, an excellent incremental business.

Considering all aerospace business in 1982, 359 new government contracts were signed with 26 different U.S. agencies, and in the same period the company undertook 1,008 new contracts with thirteen private companies. Aerospace is again vital, growing, and the element of risk in the business has been controlled and reduced because of the company's tight policies and internal diversification. The resurgence of the aerospace company is clearly demonstrated by the fact that in

KAMAN AEROSPACE SH-2F LAMPS (LIGHT AIRBORNE MULTI-PURPOSE SYSTEM) MK I HELICOPTER FOR THE U.S. NAVY

the difficult recession year of 1982 for bearings and music, aerospace contributed more than half of the operating profits of the corporation.

The Future

The future of Kaman is soundly based on our own "strategic triad"—TECHNICAL PREEMINENCE, FISCAL RESTRAINT and the DEDICATION OF OUR PEOPLE.

TECHNICAL PREEMINENCE in Aerospace and Sciences is maintaining the "cutting edge" of many technologies. In music manufacturing it is the introduction of guitar innovations each and every year and new generations of musical strings. In distribution programs in both music and bearings it is creative marketing, increasingly sophisticated computerization, proficient engineering and sales/service support.

FISCAL RESTRAINT is simply fiscal conservatism as a business philosophy. It is seen in the allocation of company resources first to

working capital and second to fixed plant and equipment. Manufacturing operations in defense are supported by use of some government-owned facilities and significant progress payments which conserve Kaman credit. Distribution operations are made to satisfy the strategy by making assets turn fast. Also low, fixed capital requirements assist liquidity. It is the exact opposite of "buy-ins" to "absorb overheads."

THE DEDICATION OF OUR PEOPLE is the root cause of the growth of the company. Kaman encourages a special blend of entrepreneurial spirit limited only by broad corporate policies. For example, before Kaman acquires any company, it requires that there be people chemistry and that the management of the acquired company stay on to continue to expand the business with the help of Kaman expertise and capital. Free exchange of information among diverse groups of operating managers working in industrial, government and consumer markets gives broad perspective on the national economy as a whole, thus permitting anticipation, rather than reaction, to changes in the business environment. I have the greatest enthusiasm for what this group of people can do.

To key the intensity of effort in diversifying the company, here are a few simple statistics. For an overall look at the growth of Kaman, it took from 1945 to 1972 or twenty-seven years to achieve the first year of $100 million in sales. The second $100 million occurred in five years and the third occurred in two. Today, with projected annual revenues at $500 million, the company has embarked on a vigorous expansion of its many technologies and services.

Another interesting comparison is organizational size. In 1967, there were five subsidiary corporations operating in eleven locations around the country. In 1983, there are twenty-four corporations and 184 locations. Yet Kaman has never undertaken a hostile takeover.

When Kaman Aircraft began, helicopter opportunities seemed to be the only road to growth and stability. Time has proven that helicopter technology was transferable in virtually hundreds of ways to other products and services while the real motivation was the thrill of participation in the free enterprise system, and to accomplish and to succeed in whatever was undertaken.

Lastly, a word about our freedom. This story and this privilege of standing here speaking to you can happen because we are Americans.

Three days ago I stood on the border between East and West Germany. Just across the way was the town of Fuschl—before the war the trading center of the whole area, now quiet and depressed. There were two border guards with rifles in a tower. We've all read about it and seen it on television, but no one can have that personal experience without realizing that the most precious asset in the world is our freedom. I have the deepest of feelings about that cherished asset. Let us never forget we are free.

Thank you sincerely for this opportunity to address this august Society.

THE END

"Actorum Memores simul affectamus Agenda!"

THE NEWCOMEN SOCIETY OF THE UNITED STATES

In April 1923, the late L. F. Loree (1858-1940) of New York, then dean of American railroad presidents, established a group now known as "American Newcomen" and interested in Business History, as distinguished from political history. Its objectives center in the beginnings, growth, development, contributions, and influence of Industry, Transportation, Communication, the Utilities, Mining, Agriculture, Banking, Finance, Economics, Insurance, Education, Invention, and the Law—these and correlated historical fields. In short, the background of those factors which have contributed or are contributing to the progress of Mankind.

The Newcomen Society of the United States is a nonprofit membership corporation chartered in 1961 under the Charitable Law of the State of Maine, with headquarters at 412 Newcomen Road, Exton, Pennsylvania 19341, some five miles east of Downingtown, Pennsylvania, and 32 miles west of the City of Philadelphia. Here also is located The Thomas Newcomen Memorial Library and Museum in Steam Technology and Industrial History, a reference collection, including microfilm, open to the public for research and dealing with the subjects to which the Society devotes attention.

Meetings are held throughout the United States of America and across Canada at which Newcomen Addresses are presented by leaders in their respective fields.

The approach in most cases has been a life-story of corporate organizations, interpreted through the ambitions, the successes and failures, and the ultimate achievements of those pioneers whose efforts laid the foundations of the particular enterprise.

The Society's name perpetuates the life and work of Thomas Newcomen (1663-1729), the British pioneer, whose valuable contributions in improvements to the newly invented Steam Engine brought him lasting fame in the field of the Mechanic Arts. The Newcomen Engines, whose period of use was from 1712 to 1775, paved a way for the Industrial Revolution, Newcomen's inventive genius preceded by more than 50 years the brilliant work in Steam by the world-famous James Watt.

The Newcomen Society of the United States is affiliated with The Newcomen Society for the Study of the History of Engineering and Technology, with offices at The Science Museum, South Kensington, London, S.W. 7, England. The Society is also associated in union with the Royal Society for the Encouragement of Arts, Manufactures and Commerce, whose offices are at 6 John Adam Street, London, W.C. 2, England.

Members of American Newcomen, when in Europe, are invited to visit the home of Thomas Newcomen at Dartmouth in South Devonshire, England, and to see the Dartmouth Newcomen Engine working.

"The roads you travel so briskly
lead out of dim antiquity,
and you study the past chiefly because
of its bearing on the living present
and its promise for the future."

—LIEUTENANT GENERAL JAMES G. HARBORD,
K.C.M.G., D.S.M., LL.D., U.S. ARMY (RET.)
(1866-1947)

Late American Member of Council at London
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