

ANNUAL  
REPORT  
1962



LING-TEMCO-VOUGHT, INC.

## Directors

ROBERT McCULLOCH <sup>°</sup>	<i>Chairman of the Board and Chief Executive Officer</i>	O. R. MOORE	<i>Chairman of the Board American Security Insurance Company, Atlanta, Georgia</i>
JAMES J. LING <sup>°</sup>	<i>Vice Chairman of the Board and Chairman of the Executive Committee</i>	W. H. OSBORN, JR.	<i>Partner, Lehman Brothers, New York, New York</i>
R. C. BLAYLOCK <sup>°</sup>	<i>Vice President and Technical Director</i>	TROY V. POST	<i>Chairman of the Board &amp; President, Greatamerica Corporation, Dallas, Texas</i>
D. H. BYRD†	<i>D. H. Byrd Enterprises, Dallas, Texas</i>	L. T. POTTER <sup>°</sup>	<i>President, Lone Star Gas Company, Dallas, Texas</i>
V. A. DAVIDSON, M.D. <sup>°</sup>	<i>Real Estate and Investments, Dallas, Texas</i>	CLYDE SKEEN <sup>°</sup>	<i>Executive Vice President</i>
R. B. GILMORE†	<i>President, DeGolyer &amp; MacNaughton, Dallas, Texas</i>	W. P. THAYER	<i>President, Chance Vought Corp. Division, Dallas, Texas</i>
LeVAN GRIFFIS, Ph.D.	<i>Vice President, Southwest Research Institute—Houston, Houston, Texas</i>	J. O. WELDON	<i>President, Continental Electronics Companies, Dallas, Texas</i>
GIFFORD K. JOHNSON <sup>°</sup>	<i>President</i>		

<sup>°</sup>Executive Committee

† Executive Committee Alternate Members

## Officers

ROBERT McCULLOCH	<i>Chairman of the Board and Chief Executive Officer</i>	R. C. BLAYLOCK	<i>Vice President and Technical Director</i>
JAMES J. LING	<i>Vice Chairman of the Board and Chairman of the Executive Committee</i>	R. J. FLYNN	<i>Vice President and Assistant to the President</i>
GIFFORD K. JOHNSON	<i>President</i>	B. L. BROWN	<i>Treasurer</i>
CLYDE SKEEN	<i>Executive Vice President</i>	HARRY E. KAY	<i>Secretary and General Counsel</i>
		E. J. TANNER	<i>Controller</i>

## Transfer Agents

Republic National Bank of Dallas, Dallas, Texas  
The Chase Manhattan Bank, New York, New York  
Bank of America National Trust and Savings Association, Los Angeles, California

## Registrars

First National Bank in Dallas, Dallas, Texas  
Bankers Trust Company, New York, New York

## Trustees

First Mortgage 5¼% Sinking Fund Bonds:

The First National Bank of Fort Worth, Fort Worth, Texas

## Trustees, Conversion and Paying Agents

5¼% Convertible Subordinated Debentures:

Republic National Bank of Dallas, Dallas, Texas

5½% Subordinated Convertible Debentures:

Bank of America National Trust and Savings Association, Los Angeles, California

## Auditors

Ernst & Ernst

Common Stock and 5½% Subordinated Convertible Debentures listed on the New York Stock Exchange.



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**Notice to Stockholders:**

The Annual Meeting will be held at Dallas, Texas, on April 25, 1963. Formal notice of the meeting together with the proxy statement and form of proxy, will be sent to stockholders on or about March 20, 1963.



## FINANCIAL HIGHLIGHTS

	1962	1961
FOR THE YEAR ENDED DECEMBER 31:		
Sales	\$325,439,135	\$192,847,111*
Net earnings (loss)	8,650,069	(13,158,591)*
Per common share	3.03†	(4.99)*
AT DECEMBER 31:		
Working capital	\$ 46,268,154	\$ 36,030,530
Stockholders' equity	26,655,718	17,916,594
Per common share	7.87†	4.79
Backlog	362,962,000	337,145,000
Shares outstanding		
Common	2,783,600	2,775,185
Preferred	151,345	153,700
Number of employees	18,392	18,729
Number of stockholders of record		
Common	17,795	18,713
Preferred	4,685	4,915

\* Includes Chance Vought Corporation and subsidiaries for only the four month period from date of acquisition, September 1, 1961.

† After giving effect to dividends of \$204,316 accrued to the holders of preferred stock.



## TO THE STOCKHOLDERS:



It is a pleasure to present this report on the Company's first full year of operations as Ling-Temco-Vought, Inc. The year 1962 was one of consolidation, hard work and accomplishment, from which we have gained the experience to enter 1963 with a realistic appraisal of the Company's capabilities and with confidence in our planning for the future.

### 1962 IN REVIEW

*Earnings.* Net earnings for 1962 amounted to \$8,650,069, equal to \$3.03 per common share. This is in sharp contrast with 1961, when a loss of more than \$13,000,000 was reported, largely the result of extraordinary write-offs. No federal taxes have been accrued on 1962 earnings due to the sizeable tax loss carryforward from 1961.

Earnings per common share have been computed after giving effect to dividends of \$204,316, which have accrued to the holders of preferred stock, since earnings per common share for 1962 were in excess of \$2. This dividend could not be declared, however, because of restrictions contained

in certain of the indentures securing the Company's long-term debt. The limitations imposed by these restrictions at December 31, 1962 should be eliminated by earnings during 1963.

*Sales and Backlog.* 1962 consolidated sales amounted to \$325,439,135 as compared with sales of \$192,847,111 in 1961. The Company's consolidated backlog at December 31, 1962, amounted to approximately \$362,962,000, an increase from \$337,145,000 at the end of 1961. The financial review section of this report goes into greater detail concerning the breakdown of the Company's sales and backlog by product area and customer.



In comparing 1962 results with those of the prior year, it should be pointed out that results as reported for 1961 included Chance Vought Corporation and subsidiaries for only the four month period from date of acquisition, September 1, 1961.

*New Business.* Of the new contracts received by LTV during 1962, two are most significant, not only because of their size and future potential, but also because they projected LTV, for the first time, into the role of prime contractor for the Army. The Company now holds prime contracts for all three major branches of the armed services as well as the National Aeronautics and Space Administration. These two contracts, which were won in industry-wide competition, cover development of the Army's new tactical battlefield missile, *Lance*, and development of a new six-wheeled 1½-ton truck. Both are the result of several years of company research and development effort. These contracts will be performed in the Army's Michigan Ordnance Missile Plant located near Detroit under the management of the Company's newly organized LTV Michigan Division.

*Operating Philosophy.* Management is dedicated to placing the Company in the best possible position for continued profitable growth, a task which requires the complete integration of the many subsidiaries and divisions which comprise LTV. Considerable progress has been made since August 1961. Evaluations have been made of the capabilities, facilities, products and markets of each individual operating unit. Decisions have been made as to which products and markets are best suited to the Company's growth plans. Action has been taken to dispose of operations not suited to those plans and to combine or realign other operations to more effectively utilize their existing capabilities and facilities. Further steps are still required,

and it will take perhaps two more years to obtain maximum organizational simplicity and to realize LTV's optimum earnings potential.

During 1962, the Company's electronic computer operations and data processing facilities were centralized to obtain operating economy and standardized reporting among the LTV divisions working on government programs. The Western Research Division at Anaheim, California was placed under the management of the Dallas-based LTV Research Center to establish a single research division for the Company. The Calidyne Division in Winchester, Massachusetts was made a part of the Ling Electronics Division, resulting in a fully integrated organization devoted primarily to the development and production of complete systems of environmental testing equipment. Electron Corporation, a subsidiary, was reorganized as Continental Electronics Products Company, combining Electron's television products and Continental's standard radio broadcast equipment into one organization handling related products in the same general market area.

In 1961, the Company announced its decision to dispose of certain subsidiaries and product lines which were not complementary to LTV's primary fields of activity. In implementation of this policy, Vought Industries, Inc., engaged in the manufacture of mobile homes, was disposed of in March 1962. Later in the year, substantially all of the assets of Crusader Finance Company were sold, removing LTV from the unrelated area of wholesale and retail mobile home financing. Also during the year, the assets of the Company's Micro-modular Components Division, specializing in miniature custom semiconductor circuit assemblies, were sold. These dispositions eliminated operations which were



not contributing to the profitability of the Company and which were a continuing drain on its cash resources. In addition, and of more immediate significance, the liquidation of these operations provided more than \$11,000,000 of LTV's 1962 cash flow.

Further action was taken early in 1963 with the sale of United Electronics Company, a manufacturer of specialized vacuum tubes, and the disposition of the LTV Industrial Division.

*Management Changes.* LTV's management was strengthened during 1962 by several changes. At the corporate offices, Mr. Richard J. Flynn joined the Company as Vice President and Assistant to the President and Mr. Bernard L. Brown came to LTV as Treasurer. Mr. Harry E. Kay was advanced from his position as legal counsel for LTV's Chance Vought Corp. Division to become LTV Secretary and General Counsel. Mr. E. J. Tanner, formerly Divisional Controller of the Company's Chance Vought Astronautics Division, was elected Corporate Controller. These men bring to the LTV management team considerable background and experience in the aerospace and electronics industries.

Another significant corporate management change, affecting two of the under-signed, was made in January 1963, when Board Chairman Robert McCulloch assigned his duties and responsibilities as Chief Executive Officer of the Company to James J. Ling. Mr. Ling, in addition to serving as LTV Chief Executive Officer, retains his other offices of Vice Chairman of the Board and Chairman of the Executive Committee. Mr. McCulloch, who retains his position as Chairman of the Board, will continue to contribute his extensive knowledge and experience in the industry to the operating management in the formulation of company policy.

The process of developing a cohesive and quick-reacting LTV management team was further extended in the evaluation of executive talents that exist within each operating unit. During the year, several changes were made in key management posts in operating divisions and subsidiaries, some the result of combinations previously discussed and others as moves to strengthen management at the operating level.

## RESEARCH AND DEVELOPMENT

The Company's continued growth depends to a large extent on continuing technological development. During 1962, approximately \$9,500,000, the equivalent of \$3.40 per common share, was spent for company sponsored research and development programs. Even larger expenditures have been budgeted for 1963. In addition to this company sponsored research and development, a significant and growing number of contracts for scientific study and research and development were received from both governmental and commercial customers.

## PLANNING FOR THE FUTURE

Management is directing considerable planning effort, on both a short range and a long range basis, toward:

- Continued growth in existing products and services and in new technologies;
- Further reduction of overheads and enforcement of other economies in all operating units;
- Continued reduction of short-term bank debt and attendant interest costs;
- Retirement of portions of long-term debt;
- Minimizing dilution of common shares outstanding.



Achievement of these objectives will contribute to increased earnings for the Company. Much of the cash generated from such earnings will be required for the accomplishment of these objectives and for expansion and financing of additional growth of the Company. Consequently, a cash dividend policy with respect to common stock should not be anticipated in the near future.

As one major step in the realization of the objectives set forth above, a program for refunding a substantial portion of LTV's long-term debt has been initiated. The refunding program provides that holders of the Company's outstanding subordinated debentures will be given the opportunity to exchange the debentures which they presently hold for two new debenture issues, one bearing interest at 4 $\frac{3}{4}$ %, convertible into common stock at \$18 per share, and the other a 5 $\frac{1}{2}$ % non-convertible debenture. This refunding, although it will not immediately reduce the total dollar amount of long-term debt outstanding, will place the Company in a better position to convert debt to equity capital through debenture conversions and will reduce annual interest costs on long-term debt. On a longer range basis, the ultimate potential dilution from conversion of existing debentures will be reduced because of the lower number of shares required for conversion of the new issue.

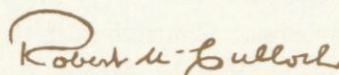
#### OUTLOOK FOR 1963

The results of 1962 operations reflect a marked change from the losses reported in the preceding year. However, management is not satisfied that 1962 results represent optimum achievements, and is dedicated to further improvement in 1963.

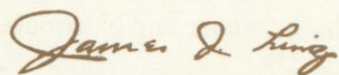
While it is premature to forecast 1963 operating results at this time, actions

already taken or now underway can be expected to result in improved pre-tax profit margins in 1963 as compared with 1962. However, federal income taxes will accrue on a substantial portion of 1963 earnings since a large part of the 1961 tax loss carryforward was used in 1962.

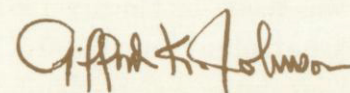
We should like to formally acknowledge, and express appreciation for, the performance, loyalty and teamwork of the thousands of employees throughout the LTV organization during the past year. These people are responsible for the Company's past accomplishments and will be responsible for those of the future. With the continued support of its employees, its stockholders and the business community, 1963 and the years ahead will be years of continuing growth and progress for LTV.



ROBERT McCULLOCH  
Chairman of the Board



JAMES J. LING  
Vice Chairman of the Board



GIFFORD K. JOHNSON  
President

MARCH 11, 1963



## RESEARCH

To grow and prosper in today's rapidly changing technological environment LTV must constantly improve its scientific knowledge and capabilities.

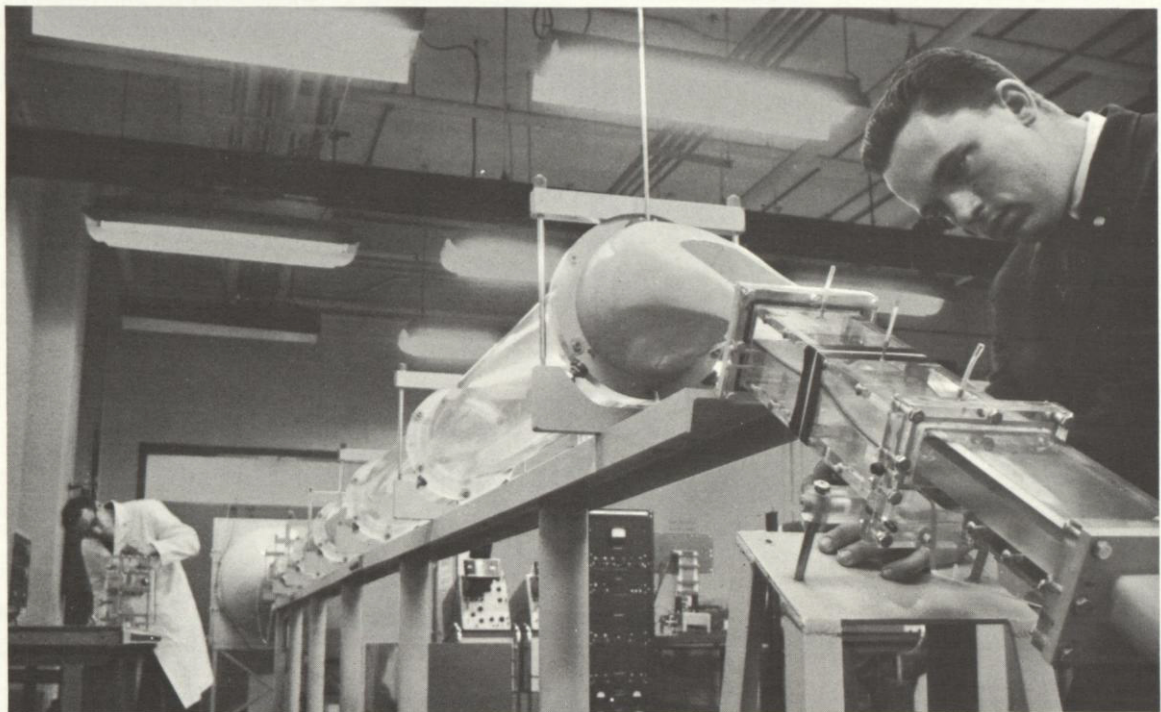
The primary responsibility for continued technological advancement through research has been assigned to the LTV Research Center, although each LTV operating unit engages in some applied research in addition to its development work. Basic studies in aerophysics, energy sources, nuclear science, materials, electronics and life sciences and

applied research in acoustics, electronics, anti-submarine warfare and transducers make up the central core of Research Center activities.

Continuing investigation of hypervelocity flight with such exotic tools as the magnetically driven shock tube, providing gas flows of up to 100,000 feet per second and gas temperatures in excess of 50,000 degrees Fahrenheit, for example, is accumulating knowledge that will be required not only for flights to the moon, but beyond the moon as well. During 1962, LTV also moved to combine its advanced capabilities in super power electronics with new developments in the field of quantum electronics in order to be prepared to develop radically new communications systems.

The corporate research program is directed not only toward new technology in areas growing out of the aerospace and electronics

*Used in the study of boundary layer air turbulence experienced with high speed space vehicles as they re-enter the earth's atmosphere, LTV Research Center's boundary layer channel will enable Center scientists to find methods to reduce skin friction drag.*





interests of LTV's operating units, but also toward enterprises new to the company, such as improved materials and the direct conversion of various forms of energy into electricity.

Work on the development of homogeneous graphites, a new material with many potential space applications, progressed to the point that pilot plant production may be instituted in 1963. At the same time, research continued on even better materials.

In December, LTV announced tentative plans to purchase a 100-acre site adjacent to the new Graduate Research Center of the Southwest in northern Dallas County as the possible site of new laboratories and other scientific facilities for the LTV Research Center. These plans would concentrate LTV's basic research activities near what promises to become one of the nation's leading centers of scientific knowledge.

## SPACE

LTV's largest space program, the *Scout* launch vehicle, successfully completed its development program in March 1962, and expanded its operational base with the completion in April of a new launch facility at Point Arguello, California. For this site on the Pacific Missile Range, LTV designed and fabricated the launcher and blockhouse equipment. Within a three-day period in December, *Scout* launched into orbit two satellites. The micrometeoroid information-gathering *Explorer XVI* was launched from NASA's Wallops Island facility on the East

Coast, and the Navy's *Transit 5A* navigational "guiding star" was launched by the Air Force from the Pacific Missile Range on the West Coast.

*Scout* and related projects, such as the *Blue Scout* and *RAM* rocket, continued to grow in business volume during the year. LTV's Chance Vought Astronautics Division is now prime vehicle contractor for both NASA and the Department of Defense *Scout* programs. *Scout* is now used as the name for a family of rockets with versions containing up to five stages, each stage consisting of a solid-propellant rocket motor. The Company manufactures the base section with its aerodynamic fins and jet vanes, the transition sections between stages, the payload attachment structure and heat shield, wiring and destruct systems, and other "hardware" required to unite the rocket motors into a complete vehicle for launching space probes and satellites. Company personnel assemble and check out each NASA *Scout* vehicle at the launching facilities before its firing.

Receipt of a \$2,500,000 contract to develop the velocity package for *Project Fire* enhanced LTV's position in the spacecraft field. *Project Fire* will obtain data on the extremely high reentry temperatures spacecraft will encounter on return from lunar missions. The 200-pound, instrumented reentry body will be rammed into the atmosphere at speeds of 25,000 miles an hour — a reentry velocity unattainable previously — to obtain data about heating rates, material reactions to high temperatures and heat-induced communications problems. The reentry will start from a peak altitude of about 750 miles, and the velocity package will have been stabilized by its control system in a precise nose-down attitude to assure proper reentry angle. The package contains its own attitude control, ignition, destruct, instrumentation and tele-



metry system. Largest item in the velocity package is the *Antares X-259* rocket motor, atop which the reentry body will be mounted by an adapter.

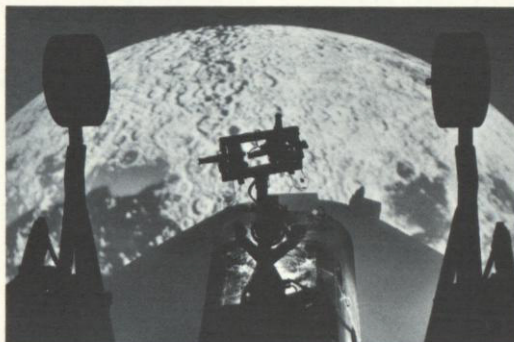
Development of the *X-20 (Dyna-Soar)* nose cap was advanced with the installation of a multi-headed propane torch capable of applying heat of up to 5,000 degrees Fahrenheit to material samples. The *X-20* is designed as a winged space glider, capable of orbital flight followed by an aircraft-like landing on earth. It will encounter extremely high reentry temperatures, with resulting critical demands on the vehicle's nose cap. The development of the nose cap by LTV stands as one of the major technological accomplishments of the *X-20* program.

The LTV-developed space flight simulator, in addition to adding to the Company's basic scientific knowledge, served as a research and training tool, under contract, for NASA's *Mercury* and *Gemini* and the Air Force's *X-20* astronauts. Space study teams have scheduled time on this simulator well into the future.

Other LTV contributions to the exploration of space during 1962 ranged from delivery of a sophisticated satellite antenna to continued contracted studies of many problem areas associated with space operations. LTV pursued many lines of investigation into astronaut protection systems and environmental devices for spacecraft. One of the new research installations is a totally black room where the visual and other sensory reactions to phenomena in space are studied in preparation for rendezvous and other space missions. Simulating the complete darkness of space, it is equipped with an air cushion effect device to provide a frictionless maneuvering base.

Many man months of engineering were invested in 1962 on a proposal for the devel-

*Duplicating a lunar mission while remaining on earth, LTV's manned space flight simulator approaches the moon as Apollo astronauts probably will see it.*



*Scout soars up from NASA's Wallops Island launching facility in December, carrying into orbit the Explorer XVI which is now gathering scientific data about micrometeoroids.*





opment of a *LEM* (Lunar Excursion Module), including a full-scale mockup, for *Project Apollo*. This proposal utilized knowledge gained from LTV's company-sponsored *MALLAR* (Manned Lunar Landing and Return) study program and on previous development projects in connection with *Apollo*. The decision to adopt the lunar orbiting technique to reach the moon was largely based on a study conducted by LTV for NASA. Although the Company was unsuccessful in obtaining the *LEM* vehicle development contract, the work accomplished added considerably to company technology required for other space systems in future competitions.

LTV began to channel its space technology into new areas, particularly the designing of spacecraft for scientific programs and for potential military systems. Many scientific investigations being conducted by LTV are in contemplation of a considerable expansion of military space activities. One such project conceived a non-orbital satellite interceptor.

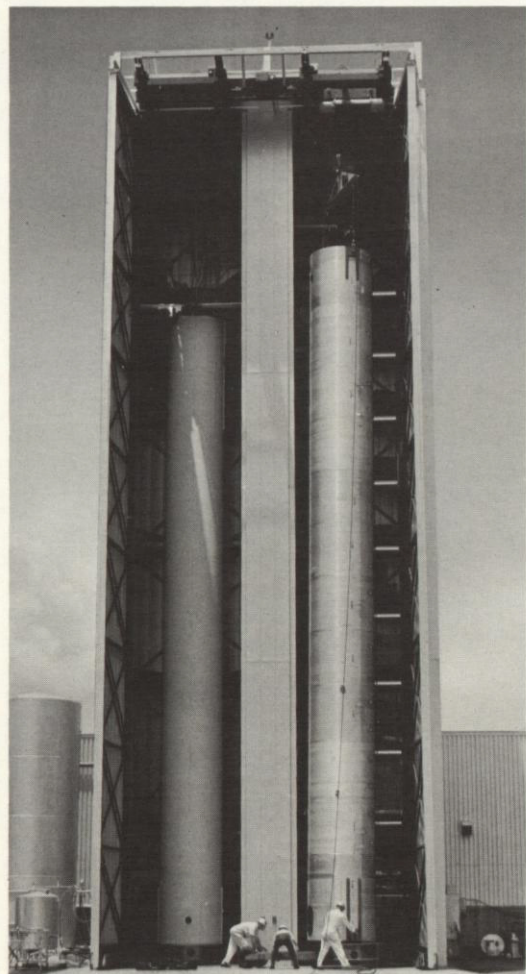
When Astronaut Walter Schirra made his six-orbit *Mercury* flight, his capsule carried a 5- by 15-inch curved panel, fabricated by LTV, bonded to one of the external beryllium shingles on the cylindrical parachute canister. Made of one of the thermal protection materials developed by the Company, the panel was purposefully slotted and cracked so that the effectiveness of heat shield repairs could be tested. This successful test was part of a program, partly sponsored by NASA, to develop improved heat shields.

The Company developed a new product concept resulting from space research during 1962 – the *AMU* (Astronauts' Maneuvering Unit), a back pack capable of adapting a spacesuited astronaut into a one-man vehicle for assembling and servicing spacecraft in orbit or interplanetary flight. Following successful demonstrations of *AMU* principles in

aircraft flying weightlessness missions, *AMU* appeared to have considerable promise for future programs.

The performance of important subcontracts for prime contractors also continued to be a major space activity, with increasing production of fuel and oxidizer containers for the heavy payload space launch vehicle *Saturn*, the liquid rocket family designed to take *Project Apollo* to the moon and back.

*Two 70-inch Saturn fuel and oxidizer containers are carefully cleaned and inspected simultaneously in this specially-designed tower at LTV's Dallas facility.*





## ELECTRONICS

Significant sales increases were recorded in aerospace electronics and communications in 1962. Markets expanded most in the major fields of electro-magnetic reconnaissance, airborne tracking and recovery systems, airborne command communications and control and communication systems for use in space, air and ground environments.

Concentration on advanced systems development and airborne applications of the latest technologies in electronics brought significant growth to the Temco Aerosystems Division, already established as a rapid-response contractor in the airborne electronic systems field. An important milestone was reached in 1962 when the results of an intensive development project were incorporated in a major satellite electronics system.

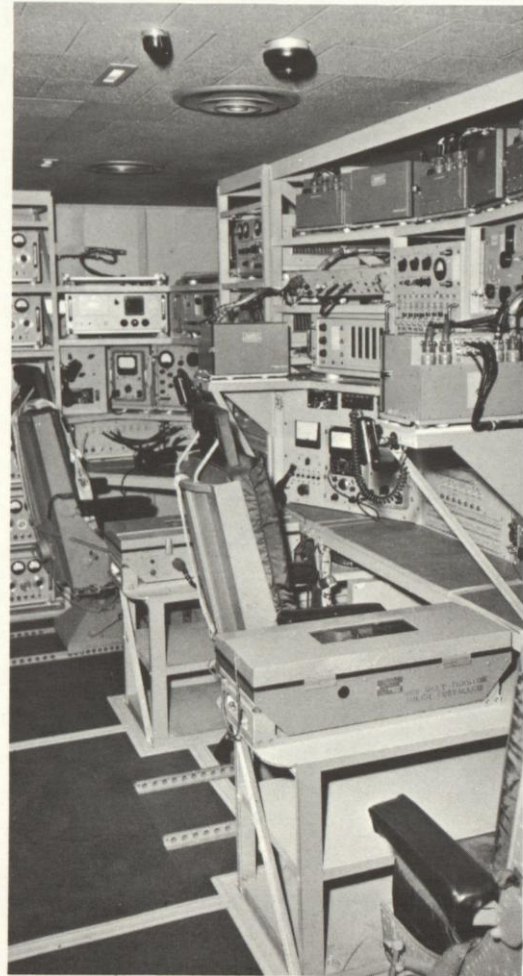
Three years of effort on an advanced electronic reconnaissance system were culminated in 1962 with successful flight testing of the prototype installed aboard a KC-135 jet aircraft. The Company performed systems integration, equipment installation and the flight testing.

Highly sophisticated airborne systems were installed and delivered on a quantity of aircraft, including multi-engine first line jets, and utilized scientific techniques developed by the Company as well as equipment of special design. Work was completed on the Atlantic Missile Range JC-130 fleet, configured for down range telemetry and tracking. Provisions were made for increased range, communication systems, modifications, special instrumentation equipment and the installation of an improved navigation system. System improvements for this fleet during 1963

on a scheduled recycle maintenance program are anticipated.

Communications research, an activity common to several LTV operating units, was directed toward improved radar, radio, sonar, television and sound systems and components. One project of LTV's Continental Electronics subsidiaries involved research into LF (Low Frequency) and VLF (Very Low Frequency) antennas. The concept and test data were included in a bid for another NATO (North Atlantic Treaty Organization) VLF installation. Because low frequency radio waves penetrate water better than

*Rapidly increasing complexity of airborne electronics systems is evidenced in an operational mockup of a project developed by LTV's Temco Aerosystems Division.*





higher frequencies, VLF communications with submerged submarines were considered by NATO during the formulation of plans to operate a fleet of *Polaris* submarines. Continental already has designed and is currently building one large NATO VLF transmitting facility for this purpose in England. Design of a large VLF transmitter to be installed in northwest Australia was completed at the end of 1962 and negotiations have commenced for the equipment manufacture and installation contracts.

The *Nike-Zeus* long-range acquisition radar development program saw the successes of the *Nike-Zeus* missile defense system in the Pacific tests as a significant accomplishment of the year.

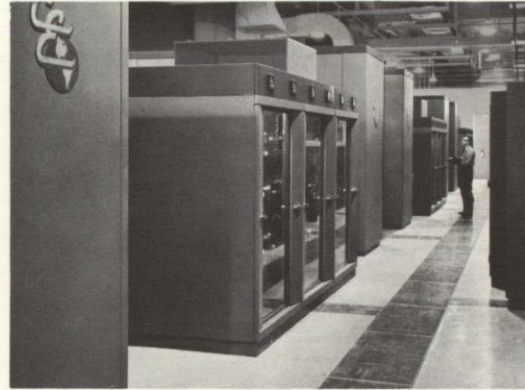
One of the most important communications contracts received in 1962 provided for the development and production of two dual-frequency pencil-beam radar systems – each with two 30-megawatt transmitters – to be installed on the White Sands Missile Range for the Air Force.

Development of a new 250-kilowatt short-wave transmitter by Continental resulted in one immediate commercial export sale. This design was the basis of bids for two large government contracts. A radio communications system designed to increase the operating range of flight control tower operators was developed by Temco Electronics under contract with the Federal Aviation Agency.

Substantial progress also was made by the Temco Electronics Division in the development of proprietary guidance systems and a sensing device to replace gyroscopes in the next generation of guidance systems. Being studied were several new techniques of rocket thrust control, embracing both fluid injection and hot gas actuation techniques.

Success in the guidance and automatic control field in 1962 was keyed largely to

*Six of LTV's 500-kilowatt transmitters, the Free World's most powerful shortwave systems, broadcast Voice of America programs from a new North Carolina station, dedicated February 8, 1963.*



*This Ling L-249 shaker in use at a large industrial test center provides 30,000 force pounds for the LTV environmental test system to help insure reliability of electronic components.*



*In the Pentagon, the Joint Chiefs of Staff see current BMEWS situation information displayed on LTV's Iconorama automatic electronic plotting system.*





the *Minuteman* electro-hydraulic actuators and *Crusader* autopilots, but also came from research and development with the introduction of the *Twin Gyro Controller* for attitude control of space vehicles, the *Pilot Feel System* for the *Boeing 727* transport and automatic control valves for the *Titan III* and *X-20* programs. Increasing sales developed for C-band beacons – or transponders – for military tracking projects, video correlators, automatic checkout equipment for *F-105* aircraft systems and large precision radar antenna reflectors.

Markets for *Iconorama* data display systems were expanded by the development of a system compact enough for shipboard installation. *Iconorama* systems replace the grease pencil and plexiglass situation displays in CIC (Combat Information Center) installations with electronically operated slide projectors capable of presenting fresh information visually as fast as it is fed through electronic computers.

Several new amplifiers, shakers and environmental vibration test system instrumentation devices were successfully introduced by LTV's Ling Electronics Division during the year, and sales increased even though the market became more competitive.

Another important achievement of Ling Electronics was the introduction of super-power pulse modulators – a product with many applications in research and development, especially in basic nuclear research. The first ten of these pulse modulators were sold to Stanford University.

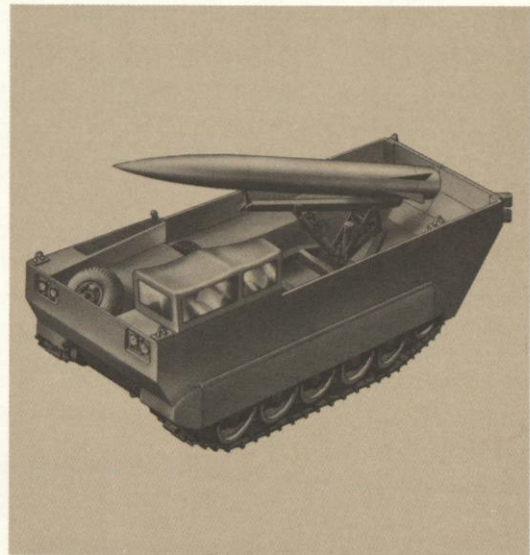
Funded research and development continued as an important electronics sales source. All phases of LTV electronics activity from the design of solid-state electronic subsystems to the engineering of special systems for satellites and spacecraft were included in these contracts.

## MISSILES

One of the most outstanding accomplishments of the year for LTV was the winning of the *Missile B* competition to develop and produce what is now the Army's new *Lance* battlefield missile system. *Lance* is LTV's most significant missile project with prospects for continuing as a major business factor for a number of years. The work will be performed by the newly established LTV Michigan Division.

LTV engineering programs to achieve the technology required to participate in Army weaponry extend back to 1958. In these earlier programs, the Company designed, fabricated and successfully test fired four battlefield missiles as prototypes of *Missile A*, and developed and tested the *Corvus* as

*In 1962, LTV won an important contract for development and production of the Army's Lance missile, shown here in an artist's concept.*





the first tactical missile with a pre-packaged, liquid rocket engine. *Lance* will be the Army's first missile powered by a pre-packaged engine that requires only a short count-down to provide "quick reaction" operations in all types of terrain and weather. It will be a surface-to-surface field division weapon system, replacing the *LaCrosse* and *Honest John* missiles.

Since 1958, Chance Vought Aeronautics & Missiles Division has been working on the concept of a high-speed nuclear ramjet powered missile designed to deliver devastating nuclear weapons anywhere on the globe with extreme accuracy provided by a self-contained guidance system. This missile would have practically unlimited range and could fly long distances at the low altitudes deemed best for escaping radar detection. During 1962, this program, under continuous Air Force contract study, became one of LTV's largest funded research and development programs.

Engineering efforts on several advanced missile systems for the Army, Navy and Air Force developed additional technology to serve as the basis of bids in 1963. Advanced work embraced a fourth generation sea-based system, a submarine air-defense weapon, a shore-bombardment missile and a medium-range anti-radiation missile to knock out enemy air-defense systems.

Modification of a number of *Regulus II* tactical missiles into *KD2U* target drones was completed during the year. These drones will serve as a basis of activity for the Chance Vought Range Systems Division for some time into the future. Also completed were subcontracts on a number of missile systems.

LTV's — and the Navy's — first tactical missile, *Regulus I*, still was operational aboard five submarines in the Pacific and the Company provided support services for *Regulus I*

training exercises in the Hawaiian Islands.

Funded studies were performed by LTV during 1962 to help determine materials and manufacturing processes for the missiles and spacecraft of tomorrow. Many types of metal alloys and plastics were studied, as were exotic techniques of welding, bonding and filament winding.

## AIRCRAFT

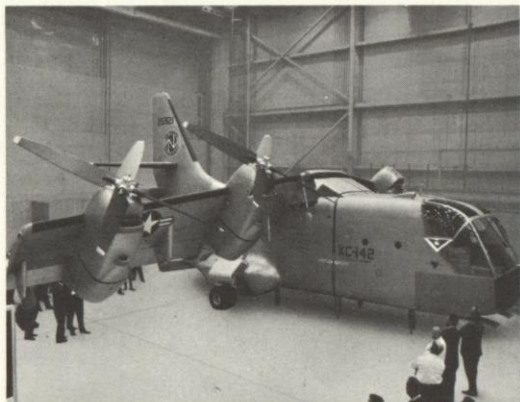
Highly significant is the work accomplished during 1962 by Chance Vought Aeronautics & Missiles Division in the development of advanced V/STOL (Vertical/Short Take Off and Landing) aircraft to improve the position LTV established in this field by winning the prime contract to develop, in conjunction with Hiller and Ryan, the *XC-142A* tilt-wing, tri-service transport.

The *XC-142A* passed a major milestone during the year with the acceptance of a full-scale mockup by a tri-service mockup board. Progress toward the first flight of the *XC-142A* in spring 1964, continued substantially on schedule. The initial contract provides for the design and manufacture of five aircraft to be tested by all three services.

Aircraft capable of taking off vertically, hovering, and landing like a helicopter as well as flying forward at conventional aircraft speeds, have many potential applications. These include transport of men and supplies to the front lines; evacuation of the wounded; fire-power and bombing support missions; aircraft carrier adaptability, with potential for landing assault troops and cargo anywhere in enemy operating areas; performance of rescues in inaccessible areas; and



*This fullscale mockup of LTV's XC-142A tri-service, tilt-wing V/STOL transport was approved and accepted by a tri-service board of officers in 1962.*



*Purchase of LTV Crusaders for use by France was announced in early 1963.*



*The Crusader, designed as an all-weather fighter, displays its attack capabilities in the large variety of bombs, rockets and missiles it can carry to target.*



use as stable platforms for gathering intelligence or directing artillery fire.

One of LTV's advanced V/STOL aircraft concepts is ADAM (Air Deflection And Modulation), using movable vanes in ducted fan engines to control the direction of flight rather than tilting either wings or engines.

Other LTV aircraft concepts in development include small assault planes for the COIN (COunter INsurgency) requirements, carrier-based ASW (Anti-Submarine Warfare) and attack planes, jet trainers and an advanced bi-service attack system.

Manufacture of the *F-8E Crusader* continued to be LTV's largest aircraft program, and production was accelerated by the Navy during the first half of 1962. Receipt of a \$47,430,000 contract extended *Crusader* production well into 1964, and the Company extensively explored new markets for the *Crusader*, including allied nations and American reserve forces. As a result of these efforts, a U.S. Navy contract covering a sizeable quantity of *F-8E Crusader* aircraft for France was awarded to LTV early in 1963.

Growth capabilities of the *Crusader* were demonstrated with the addition of a variety of externally mounted weapons in an attack version. The two-seat *Crusader* trainer, the *TF8A*, also met with success in its demonstration tour.

Airframe subcontracting continued to be an important activity. Work was performed on components of the *XRS-70*, *P2V* and *P3V*, and this business received additional emphasis near the end of the year with stronger efforts to obtain subcontracts on other programs.

Modification and maintenance of military aircraft continued as an added source of revenue, with work being performed both at Dallas and Greenville. At Dallas, a number of Navy *R4D*'s (or *C-47*'s) were recondi-



tioned, as were smaller numbers of several other types of passenger and cargo planes. In Greenville, maintenance work on C-133 aircraft, the Air Force's largest, was performed on schedule, and B-47, C-135 and other types of aircraft were modified. The Greenville facility's rapid response capabilities, developed for aircraft maintenance programs, provided the operating base for rapid growth in the airborne electronic systems field.

## SURFACE VEHICLES

Increasing emphasis on counter-insurgency measures has created requirements for advanced surface vehicles as well as special purpose aircraft. Surface vehicles designed

to be constructed of lightweight materials using airframe fabrication technology are an extension of LTV's aerospace interests.

One of the most important accomplishments of the year was the Company's entry into the surface vehicle business.

More than five years of LTV research and development led in 1962 to a \$2,500,000 prime contract for development of the XM561 1½-ton truck. This contract greatly expanded LTV's role as an Army contractor, with the work to be performed by the new LTV Michigan Division. LTV's *Gama Goat* prototype now serves as a base for the evolution of a new family of surface vehicles providing exceptional mobility for men and materials in the forward areas of the battle zone. Like the *Gama Goat*, the XM561 will be a double-bodied, six-wheeled vehicle capable of swimming inland waters and moving over rough

*All six wheels are on the ground even though the Gama Goat, prototype of the 1½-ton XM561 truck, for which LTV was named prime contractor in an initial contract for \$2,500,000 in 1962, is traversing the type of terrain that stops many other vehicles.*





terrain with an agility unmatched by other wheeled transports. *Gama Goat* was developed on the Company's own initiative and was demonstrated on numerous rugged military test courses in America, Europe and Asia. Its four-wheeled tractor unit and two-wheeled carrier are linked to provide power to all six wheels and pivoted in pitch and roll to provide unusual flexibility. Key to the vehicle's mobility is a special articulation system between the bodies, engineered to keep all six wheels on the ground at all times, regardless of terrain. Four of the six wheels — the front and rear pairs — are steerable to provide a short turning radius. The rear body section is adaptable to several designs for special missions such as missile or rocket launching, radio command operations, ambulance service and personnel, cargo and ammunition transport.

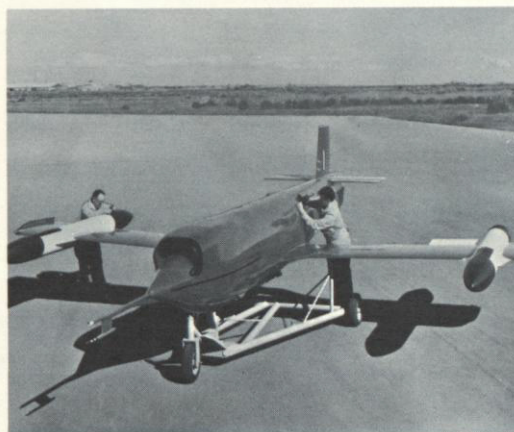
In addition, the Army increased its funding of the development program for *PATA* (Plenum Air Tread Amphibian), a rubber-treaded transport designed to operate on hard surfaces, snow or tundra and to travel in water at speed boat clips. The current phase of the program covers the design of a 1¼-ton, ten-man experimental test vehicle for rapid over-the-shore troop supply and for operation in a variety of areas from jungles to Arctic regions and from swamps and rice paddies to mountainous terrain. *PATA* operates on a continuous tread of air-filled rubber cells giving it high flotation capabilities and permitting it to ride rapidly over soft and watery terrain where other vehicles bog down. It will climb a 60% slope and operate on a 30% side slope. The plenum air principle couples advantages of the ground cushion effect machine with the positive control of wheeled and tracked vehicles. The pneumatic tread consists of a series of interconnected air cells linked together and mounted on an endless

belt similar to the tracks of a military tank. The vehicle is supported by a plenum chamber which provides a continuous flow of low-pressure air between the moving belt and the vehicle chassis. Each cell carries an air pressure of about two pounds per square inch, so the vehicle — like a man on snowshoes — has an exceedingly light "footprint." *PATA* can serve as a logistics carrier, amphibious re-supply lighter, personnel carrier, litter transport, missile carrier and Arctic or desert exploration vehicle.

## OPERATING SERVICES

Each of 1962's orbital *Mercury* flights spent a considerable amount of time over the Pacific Ocean where the radar systems tracking the capsules and the radio systems communicating with the astronauts inside were operated by LTV. Tracking and telemetry equipment that operated during the

*As a significant extension of Range Systems Division's drone services, LTV won the exclusive U. S. sales and service contract for Australia's Jindivik target drone in 1962.*





*Nike-Zeus* test firings during 1962 also were controlled by LTV employees. On the West Coast several missile development programs employed the *KD2U* target drone, maintained and operated by LTV's Chance Vought Range Systems Division. Several other facilities associated with the Pacific Missile Range, such as the Salton Sea Joint Parachute Test Facility, also are managed by LTV.

LTV acquired a new subsidiary, Kentron Hawaii, Ltd., at the beginning of the year for the specific purpose of providing better service for missile and space test range operations in the Pacific. In addition, Kentron provides military and commercial activities in the Pacific area with electronic equipment maintenance, repair and calibration services.

Another LTV organization, Altec Service Company, performs maintenance service for public address and other sound system installations in theaters and industrial plants throughout the continental United States.

LTV signed an exclusive American sales and service agency agreement for the *Jindivik* target drone with the Australian government in 1962. *Jindivik* is a highly reliable, reusable, and relatively inexpensive jet-powered, un-manned aircraft type of target drone which promises to extend LTV missile test range operations for a considerable length of time. An initial order was received from the U.S. Navy in December.

Other LTV operating services provided for military and commercial customers in 1962 included electronic computing, PERT and PERT-cost computer programs and services, the preparation of handbooks for operating and maintaining aircraft, missiles, spacecraft, surface vehicles and communications systems, as well as technical manuals and documentary films.

*The tracking antennas at LTV's Hawaiian Mercury Tracking Stations keep in constant contact with the astronauts as they orbit across the Pacific.*





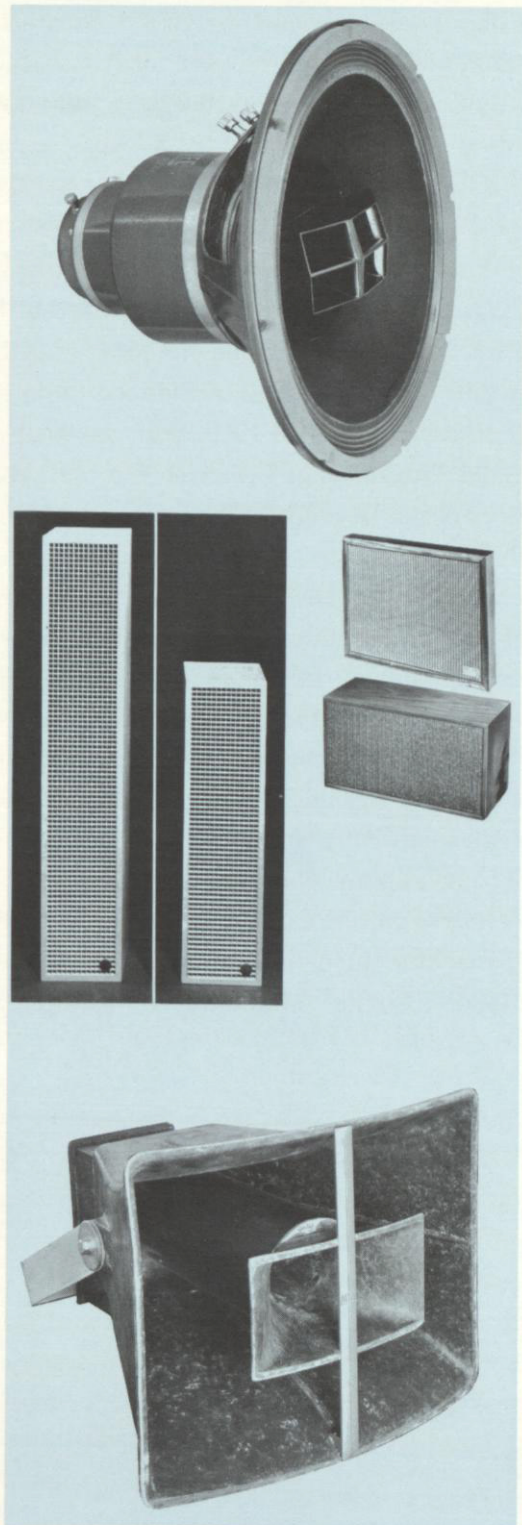
## COMMERCIAL PRODUCTS

Much of the scientific effort associated with commercial products is directed toward product improvement; annual new designs are demanded by customers for all products from central airconditioning-heating units to microphones. Beyond that, LTV's commercial business units conducted investigations leading toward new products, exploring such sciences as kinetics, acoustics, electromagnetism, radio wave propagation and communications theory.

Paging systems with military as well as commercial applications, telephonic devices, sound system control units, new speakers and new microphones were among products introduced during the year, resulting from the research and development activities of Altec Lansing and University Loudspeakers.

Altec's new products included *SEQR* (Safety EQUIPMENT Requirements), a switching device that controls dual amplifiers, speakers and other components to assure fail-safe operation of Altec's *Big Voice* sound warning systems, *NOALA* (Noise Operated Automatic Level Adjustment) paging and announcing systems for jet airports, and *REVOCON* (REmote VOLume CONtrol), a new remote control unit that provides a means of governing the gain of an amplifier from a point away from the amplifier's location. New high fidelity equipment for the home and sound studio was paced by the introduction of Altec's *Empress Royale* stereo tuner. University rapidly responded to the growing stereo markets with new products at every price level. Included were the *Syl-o-ette* speaker line designed to be installed on the wall as framed

*Altec and University speakers, designed for true high fidelity sound reproduction and reliability, fill every requirement in homes, industrial plants and sound studios.*





pictures or decorator items, the *Debonaire* lowboy speaker enclosures, the *Uniline* sound columns for decorative high-fidelity installations in public rooms and meeting areas, the *Senior* and *Companion* lines of bookshelf speaker enclosures and the *LIL-8* decorative paging and talk-back speaker for installations in department stores, restaurants and hotel lobbies. University's public address equipment lines grew with the addition of *Vanguard I* electronic siren and amplifier systems.

Development of a large line of food display refrigeration systems was completed by LTV's Friedrich companies in 1962, and this new line of products was introduced to potential customers early in 1963. Warmer weather pushed 1962 sales of Friedrich room air conditioners far beyond 1961 levels, and Friedrich proceeded to expand its marketing of these units into new geographic areas. Central air-conditioning systems also became a more important factor in Friedrich's 1962 sales and promised additional future markets.

Other new commercial products included a complete marina docking system utilizing plastic instead of wooden floats.

The Company continued development of the *Jetstream* automatic continuous laundering machine in a joint venture with International Textile Maintenance Equipment Corporation.

European operations included SEMM (Societe Europeenne de Materials Mobiles), LTV's joint venture with Sud Aviation of France, which in its first full year of operations became the largest producer of camping trailers in France. Pye-Ling, Ltd., a joint venture in England with Pye, Ltd., one of Great Britain's largest electrical-electronics companies, completed its first full year of operations producing vibration environmental test systems and sub-systems for expanding European markets.

Overseas sales of commercial broadcast equipment also increased with additional sales to Egypt and sale of a large broadcast system, including a 250-kilowatt shortwave transmitter, to be installed on the island of Curacao for a religious broadcasting agency.

Domestic sales of Continental Electronics commercial broadcast equipment also rose, as did domestic sales of Ling Electronics vibration environmental test systems and devices.

The reorganization of Electron Corporation into Continental Electronics Products Company combining Continental's fine line of commercial broadcast transmitters with Electron's closed-circuit television interests promised additional expanded opportunities in commercial electronic sales.



FINANCIAL  
REPORT

1962

LTV



## FINANCIAL REVIEW

*Sales.* Consolidated sales for 1962 totaled \$325,439,135. In 1961, sales amounted to \$192,847,111, including the sales of Chance Vought Corporation and subsidiaries for only the four month period from the date of their acquisition, September 1, 1961. Consolidated sales of Chance Vought and subsidiaries for the eight months ended August 31, 1961, were \$121,808,842.

Government business accounted for \$278,824,468, or 86%, of 1962 sales, with the balance of \$46,614,667, or 14%, consisting of commercial business. The composition of 1962 sales by major product area is as follows:

Space, missiles and aircraft	58%
Electronics	30
Other	12

*Earnings.* 1962 consolidated earnings amounted to \$8,650,069, the equivalent of \$3.03 per common share based on the 2,783,600 common shares outstanding at December 31, 1962. No federal income taxes were accrued on these earnings due to the Company's tax loss carryforward from 1961.

In computing 1962 earnings per common share, effect has been given to dividends on the Company's 4½% Series A Preferred Stock in the aggregate amount of \$204,316. As was mentioned earlier in this report, restrictions contained in certain of the indentures securing the Company's long term debt prohibit declaration of the preferred dividend at this time. Accordingly, no provision for such dividend has been accrued on the December 31, 1962 balance sheet. Reference is made to Note D to the accompanying financial statements for information concerning surplus restrictions relating to dividends on both preferred and common stock.

*Backlog.* The Company's backlog of orders at December 31, 1962, amounted to \$362,962,000, up from \$337,145,000 a year earlier.

Current backlog figures include \$340,251,000 of government business, approximately 94% of total backlog. This compares



with \$306,092,000, or 91%, at the end of 1961. It is significant that the backlog in 1962 is distributed much more evenly among the three military services and to NASA and other government agencies than in 1961, as shown by the following tabulation:

	<u>1962</u>	<u>1961</u>
Navy	35%	51%
Air Force	37	43
Army	23	1
NASA and Other	5	5
	<u>100%</u>	<u>100%</u>

*Working Capital.* Working capital at December 31, 1962 was \$46,268,154, representing a 28% increase over the \$36,030,530 reported at the end of 1961. The Company's current ratio increased to 1.66 to 1 at December 31, 1962 from 1.41 to 1 at December 31, 1961.

In October 1962, the Company renewed its Loan Agreement providing for a revolving line of credit, reducing the maximum commitment of the banks participating in the credit line from \$60,000,000 to \$50,000,000. During the year, short-term borrowings were reduced by \$9,600,000, and at December 31, 1962, outstanding borrowings under this line of credit totaled \$39,000,000. Additional repayments have been made since year-end,

and it is expected that substantial further reductions in outstanding short-term debt will be effected during the balance of 1963.

*Plant and Equipment.* Expenditures during 1962 for the purchase of new capital assets, primarily machinery and equipment, totaled \$3,447,000. Depreciation and amortization charges for the year amounted to \$5,652,124. At December 31, 1962 the Company's investment in fixed assets, at cost, amounted to \$51,171,697, and the book value of these assets was \$35,461,303.

At year-end, the Company and its subsidiaries occupied facilities containing approximately 6,325,000 square feet of floor space, of which 830,000 square feet are owned and the remaining 5,495,000 square feet are leased. Not included in these figures is the Army-owned Michigan Ordnance Missile Plant near Detroit, which will be occupied during 1963 for the operations of the LTV Michigan Division.

*Stockholders' Equity.* At December 31, 1962 consolidated stockholders' equity stood at \$26,655,718, an increase of 49% over that at December 31, 1961. Stockholders' equity per common share at December 31, 1962 amounted to \$7.87 as compared to \$4.79 a year ago.



# CONSOLIDATED BALANCE SHEET

LING-TEMCO-VOUGHT, INC. AND SUBSIDIARIES

## Assets

	December 31	
	1962	1961
<b>CURRENT ASSETS</b>		
Cash and U. S. Government securities . . . . .	\$ 9,846,586	\$ 7,426,013
Notes and accounts receivable, less allowances (1962 - \$1,330,827; 1961 - \$1,455,255) for doubtful receivables - Note C . . . . .	28,618,859	37,777,190
Unreimbursed costs and fees under cost plus fixed fee contracts - Note C . . . . .	33,699,820	21,589,736
Refundable federal taxes on income - estimated . . . . .	190,500	1,828,160
Inventories, less progress payments received - Notes B and C . .	43,539,954	53,688,186
Prepaid expenses . . . . .	822,906	1,340,892
TOTAL CURRENT ASSETS	\$116,718,625	\$123,650,177
<b>INVESTMENTS AND OTHER ASSETS</b>		
Investments in and advances to unconsolidated subsidiaries and affiliated companies . . . . .	\$ 3,489,227	\$ 3,266,628
Notes and accounts receivable and other investments, less \$595,072 allowance for doubtful receivables in 1962 . . . . .	5,421,416	3,823,596
Excess of investment in subsidiaries over net assets acquired, patents and trademarks, less amortization . . . . .	2,814,435	2,227,367
Unamortized debt expense . . . . .	320,631	354,494
TOTAL INVESTMENTS AND OTHER ASSETS	\$ 12,045,709	\$ 9,672,085
<b>PROPERTY, PLANT, AND EQUIPMENT - Note D</b>		
Land, buildings, machinery and equipment - at cost . . . . .	\$ 51,171,697	\$ 52,620,555
Less allowances for depreciation . . . . .	15,710,394	11,800,683
TOTAL PROPERTIES - NET	\$ 35,461,303	\$ 40,819,872
	\$164,225,637	\$174,142,134



## Liabilities and Stockholders' Equity

	December 31	
	1962	1961
CURRENT LIABILITIES		
Notes payable to banks—Note C . . . . .	\$ 39,000,000	\$ 48,600,000
Accounts payable . . . . .	17,351,108	25,861,460
Accrued compensation, taxes, interest, etc. . . . .	13,625,039	12,634,619
Current portion of long-term debt—Note D . . . . .	474,324	523,568
	<hr/>	<hr/>
TOTAL CURRENT LIABILITIES	\$ 70,450,471	\$ 87,619,647
LONG-TERM DEBT—Notes D and L . . . . .	64,198,617	64,948,003
RESERVES		
For deferred federal taxes on income . . . . .	\$ 528,813	\$ 528,813
For possible future losses arising from adjustment or disposition of assets . . . . .	2,392,018	2,450,000
	<hr/>	<hr/>
TOTAL RESERVES	\$ 2,920,831	\$ 2,978,813
MINORITY INTEREST IN SUBSIDIARY COMPANIES		
(not consolidated in 1962—Note A) . . . . .	—	679,077
STOCKHOLDERS' EQUITY		
Preferred stock, par value \$30—Notes E, F, and G: Authorized 1,000,000 shares; issued 1962—151,345 shares; 1961—153,700 shares . . . . .	\$ 4,540,350	\$ 4,611,000
Common stock, par value \$0.50—Notes E, F, G, and L: Authorized 9,000,000 shares; issued 1962—2,783,600 shares; 1961—2,775,185 shares . . . . .	1,391,800	1,387,593
Capital surplus—Note H . . . . .	5,908,054	5,752,556
Retained earnings—Note D . . . . .	14,815,514	6,165,445
	<hr/>	<hr/>
TOTAL STOCKHOLDERS' EQUITY	\$ 26,655,718	\$ 17,916,594
COMMITMENTS AND CONTINGENCIES—Note I		
	<hr/>	<hr/>
	\$164,225,637	\$174,142,134
	<hr/>	<hr/>

See notes to financial statements.



# STATEMENT OF CONSOLIDATED INCOME AND RETAINED EARNINGS

LING-TEMCO-VOUGHT, INC. AND SUBSIDIARIES

	Year ended December 31	
	1962	1961
Net sales, including costs and fees under cost plus fixed fee contracts . . . . .	\$325,439,135	\$192,847,111
Other income . . . . .	590,840	883,371
	\$326,029,975	\$193,730,482
Costs and expenses:		
Manufacturing costs, selling, administrative and general expenses . . . . .	\$311,193,861	\$203,305,905
Interest expense . . . . .	5,820,490	3,732,306
Provision for losses on adjustment or disposition of assets . . .	—	1,000,000
Other expenses . . . . .	218,800	219,168
	\$317,233,151	\$208,257,379
INCOME (LOSS) BEFORE TAXES ON INCOME	\$ 8,796,824	\$ (14,526,897)
Federal, state, and foreign taxes on income (refundable) — estimated — Note K . . . . .	146,755	(1,368,306)
NET INCOME (LOSS)	\$ 8,650,069	\$ (13,158,591)
Retained earnings at beginning of year . . . . .	6,165,445	19,324,036
RETAINED EARNINGS AT END OF YEAR — Note D	\$ 14,815,514	\$ 6,165,445

Provision for depreciation and amortization amounted to \$5,652,124 for 1962, and \$3,388,338 for 1961.

See notes to financial statements.



## ACCOUNTANTS' REPORT

To the Stockholders and Board of Directors,  
Ling-Temco-Vought, Inc.,  
Dallas, Texas

We have examined the consolidated balance sheet of Ling-Temco-Vought, Inc. and subsidiaries as of December 31, 1962, and the related statement of consolidated income and retained earnings for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. It was not practicable to confirm by direct correspondence amounts receivable from United States Government departments, but we satisfied ourselves as to such amounts by means of other auditing procedures.

In our opinion, the accompanying balance sheet and statement of income and retained earnings present fairly the consolidated financial position of Ling-Temco-Vought, Inc. and subsidiaries at December 31, 1962, and the consolidated results of their operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

ERNST & ERNST

Dallas, Texas  
February 22, 1963

## NOTES TO FINANCIAL STATEMENTS December 31, 1962

### Note A — Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its subsidiaries, except for Information Systems, Inc., an 80%-owned consolidated subsidiary at December 31, 1961, which became a 60%-owned unconsolidated subsidiary beginning April 30, 1962. Chance Vought Corporation, which was acquired as of August 31, 1961, has been included in the accompanying financial statements subsequent to that date.

### Note B — Inventories

Inventories are stated generally at average or accumulated costs, not in excess of market, and are detailed as follows:

	1962	1961
Finished products . . . . .	\$ 4,874,735	\$ 8,010,029
Fixed price contracts, etc. in progress . . . . .	51,148,595	53,923,949
Raw materials and purchased parts . . . . .	15,545,511	23,357,735
	<u>\$71,568,841</u>	<u>\$85,291,713</u>
Less progress payments received . . . . .	28,028,887	31,603,527
	<u>\$43,539,954</u>	<u>\$53,688,186</u>

### Note C — Loan Agreement with Banks

Under the terms of a loan agreement expiring September 30, 1963, the Company may borrow up to \$50,000,000 (\$39,000,000 of such borrowings are reflected in the consolidated balance sheet at December 31, 1962). Receivables, unreimbursed costs and fees under cost plus fixed fee contracts, and inventories assigned as collateral to the loans as of December 31, 1962, aggregated \$21,533,000, \$32,253,000, and \$14,819,000, respectively (after deducting progress payments received on the inventories). The agreement, as amended, contains requirements covering maintenance of working capital, net worth, and other matters.

### Note D — Long-Term Debt and Dividend Restrictions

Long-term debt due beyond one year comprises the following:

	1962	1961
5½% Subordinated convertible debentures due September 1, 1976 . . . . .	\$53,097,800	\$53,272,913
5¼% Convertible subordinated debentures due October 1, 1971 . . . . .	3,500,000	3,608,000
6¼% Senior notes due December 1, 1974 . . . . .	5,000,000	5,000,000
5½% First mortgage sinking fund bonds due August 1, 1970 . . . . .	2,560,000	2,920,000
Sundry mortgage notes payable . . . . .	40,817	147,090
	<u>\$64,198,617</u>	<u>\$64,948,003</u>

Annual maturities and sinking fund requirements during the next five years range from \$474,324 to \$1,066,324 through 1966, and \$4,366,324 in 1967.

The loan agreements and indentures pertaining to long-term debt contain requirements as to the maintenance of working capital and certain restrictions as to the payment of dividends. Under the most restrictive provision of the agreements and indentures, all of the consolidated retained earnings at December 31, 1962, and \$2,976,446 of future earnings (as defined) were then restricted as to use for payment of dividends (other than in capital stock of the Company) on common stock or for purchase, redemption, or other retirement of the Company's capital stock, and \$1,295,397 of future earnings (as defined) were restricted as to payment of dividends on the preferred stock. (The foregoing restrictions would not be affected by the offer of the debentures referred to in Note L.)

### Note E — 4½% Series A Preferred Stock

There are 1,000,000 shares of Series preferred stock, \$30 par value, authorized, of which 252,000 shares of 4½% Series A preferred stock were authorized at December 31, 1962. The



preferred stock is convertible into common stock on a share-for-share basis to June 30, 1965 and on a reduced basis thereafter. The stock is subject to redemption on and after July 1, 1965 at 105% of par value plus accumulated unpaid dividends, and is required to be redeemed on July 1, 1970.

Each share of preferred stock is entitled to receive cash dividends to the extent consolidated net earnings exceed \$2 per share on common stock outstanding on the last day of each year, limited in any year to 4% of its par value of \$30. Dividends are cumulative and payable before any dividends are paid on common stock. At December 31, 1962, such accumulated unpaid dividends amounted to \$204,316. (However, reference should be made to Note D regarding restrictions on payment of dividends.)

#### Note F — Common and Preferred Stock Reserved

At December 31, 1962, the Company had reserved shares of its capital stock as follows (reference is made to Note G concerning shares of capital stock reserved for option plans):

RESERVED FOR	COMMON STOCK		4½% SERIES A PREFERRED STOCK	
	NUMBER OF SHARES	PRICE PER SHARE	NUMBER OF SHARES	PRICE PER SHARE
Conversion of 5½% debentures	1,525,798	\$34.80 (1)	—	—
Conversion of 5¼% debentures	97,679	29.55 (2)	24,420	\$29.55 (2)
Warrants expiring December 1, 1969, issued with 6¼% senior notes	{ 52,268 15,090	{ 31.57 and 32.80 (3)	—	—
Warrants expiring August 31, 1966, issued in connection with purchase of Chance Vought assets	{ 244,128 244,128	{ 30.00 40.00	—	—
Conversion of preferred stock into common stock	151,345 (4)	—	—	—

(1) Conversion price of 5½% debentures is \$39.54 after August 31, 1966. Such prices are subject to adjustments for anti-dilution provisions.

(2) Conversion price of 5¼% debentures is \$32.30 after October 1, 1966. Such prices are subject to adjustments for anti-dilution provisions.

(3) Exercise price for certain warrants (15,090 shares) with 6¼% senior notes is \$37.77 after December 1, 1964. Such prices are subject to adjustments for anti-dilution provisions.

(4) Exclusive of additional shares which may become reserved upon issuance of preferred stock in conversions, and upon exercise of stock options.

(See Note L regarding the debentures proposed to be issued in exchange for the 5½% and 5¼% debentures, and the conversion rights thereof.)

#### Note G — Options to Purchase Common and Preferred Stock

The Company has a plan, adopted in 1957, for granting restricted stock options to officers and employees of the Company and its subsidiaries. Under the plan, options may be granted at a price not lower than 85% of market price at date of grant and the terms of such options may range from a minimum of two years to a maximum of ten years from date of grant. Options are outstanding under two other restricted stock option plans which were assumed in connection with the acquisition of Temco Aircraft Corporation and the purchase of the assets of Chance Vought Corporation in 1960 and 1961, respectively. No additional options will be granted under the Temco plan or the Chance Vought plan. At December 31, 1962, the Company had reserved under all plans an aggregate of 316,751 shares of common stock and 13,152 shares of 4% Series A preferred stock, of which 230,196 common shares and all of the reserved preferred shares were issuable at option prices aggregating \$5,837,041. Under the plans during 1962, 6,510 common shares and 48 preferred shares were issued at option prices aggregating \$99,746; options for 130,519 shares of common and 894 shares of preferred were cancelled or forfeited, and options were granted for 24,715 shares of common stock at option prices aggregating \$456,085. Unoptioned shares under the plans at December 31, 1962, aggregated 86,555 shares of common stock.

In addition to the foregoing, options granted in 1960 covering 23,781 shares of the Company's common stock which did not fall within the definitions of the Company's restricted stock option plans were cancelled during 1962.

#### Note H — Capital Surplus

	1962	1961
Balance at beginning of year	\$5,752,556	\$2,238,853
Excess of principal amount of subordinated convertible debentures over par value of common and preferred shares issued upon conversion	—	1,889,012
Excess of par value of preferred stock over par value of common shares issued in conversion	70,947	1,270,005
Excess over par value of proceeds from sale of common and preferred stock under option plans	84,551	354,686
Balance at end of year	\$5,908,054	\$5,752,556

#### Note I — Commitments and Contingencies

Certain sales subsequent to 1959 are subject to renegotiation and, in addition, renegotiation proceedings under the Renegotiation Act of 1951 have resulted in an assessment (net of applicable federal income tax credits) of \$1,003,790 for the year 1953. Because in the opinion of the Company's management no excessive earnings have been realized in any of these years, no provision has been made for refunds or interest thereon, and suit has been filed in the Tax Court of the United States to eliminate the assessment in respect to 1953.

The Companies were contingently liable for customer indebtedness guarantees and/or repurchase agreements aggregating approximately \$1,500,000 at December 31, 1962.

Substantial portions of plant facilities used by the companies are leased from the United States Government and others. Minimum expenditures under the leases are approximately \$1,100,000 annually. Certain of the leases expire in the near future; the Company expects to negotiate renewals of such leases where desired or to find comparable space at rentals not significantly higher than the rentals under such leases. During 1962, the Company agreed to lease office space in a building to be erected, for a period of twenty-three years after completion, at an annual rental of \$616,000, and to lease additional space in such building in the event that lease contracts therefor do not exceed a minimum required annual rental. The Company intends to sublease to others, however, a large portion of this space.

#### Note J — Pension Plans

The presently estimated annual cost of pension plans, including amortization of past service costs, amounts to approximately \$5,000,000. Estimated unfunded past service liability amounted to approximately \$87,000 at December 31, 1962.

#### Note K — Federal Income Tax Loss Carry-Forward

As a result of the consolidated operating loss for 1961, a loss carry-forward of approximately \$11,000,000 should be available for application against taxable income during 1962 and the four following years. Accordingly, no provision for taxes was required for the year ended December 31, 1962.

#### Note L — Subsequent Events

The Company intends to offer \$23,043,120 of 4% Subordinated Convertible Debentures and \$33,662,680 of 5% Subordinated Debentures, both due September 1, 1976, in exchange for the presently outstanding 5% and 4% debentures referred to in Notes D and F. The 4% debentures will be convertible into common stock on the basis of \$18 per share.

During February, 1963, the Company sold certain assets for a consideration consisting primarily of long-term notes receivable, which had the effect of transferring approximately \$2,100,000 of current assets to other assets.



## Divisions and Subsidiaries

Altec Lansing Corporation  
1515 South Manchester Avenue  
Anaheim, California

Peerless Electrical Products Division  
1515 South Manchester Avenue  
Anaheim, California

Altec Service Company  
222 Park Avenue South  
New York, New York

Chance Vought Corp. Division  
P.O. Box 5907  
Dallas 22, Texas

Aeronautics and Missiles Division  
P.O. Box 5907  
Dallas 22, Texas

Astronautics Division  
P.O. Box 6267  
Dallas 22, Texas

Range Systems Division  
1507 Pacific Avenue  
Dallas, Texas

LTV Michigan Division  
38111 Van Dyke Road, Sterling Township  
Utica, Michigan

Continental Electronics Manufacturing Company  
4212 South Buckner Boulevard  
Dallas, Texas

Continental Electronics Systems, Inc.  
4212 South Buckner Boulevard  
Dallas, Texas

Continental Electronics Products Company  
P.O. Box 5024  
Dallas 22, Texas

Ed Friedrich Incorporated  
1117 East Commerce Street  
San Antonio, Texas

Friedrich Refrigerators Incorporated  
1117 East Commerce Street  
San Antonio, Texas

Harbor Boat Building Co.  
258 Cannery Street  
Terminal Island, California

Kentron Hawaii, Ltd.  
1140 Waimanu Street  
Honolulu 14, Hawaii

Ling Electronics Division  
1515 South Manchester Avenue  
Anaheim, California

Ling Electronics Calidyne Plant  
120 Cross Street  
Winchester, Massachusetts

Ling-Altec Export Corporation  
222 Park Avenue South  
New York, New York

Ling-Altec Western Hemisphere Corporation  
222 Park Avenue South  
New York, New York

LTV Research Center  
P.O. Box 5907  
Dallas 22, Texas

Temco Electronics & Missiles Company Division  
P.O. Box 6191  
Dallas 22, Texas

Temco Aerosystems Division  
P.O. Box 1056  
Greenville, Texas

Temco Electronics Division  
P.O. Box 6118  
Dallas 22, Texas

Temco Electronics Division Display Systems Plant  
12820 Panama Street  
Los Angeles, California

University Loudspeakers Division  
80 South Kensico Avenue  
White Plains, New York





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