LTV LING-TEMCO-VOUGHT, INC.



ANNUAL REPORT 1961

DIRECTORS □ ROBERT McCULLOCH* □ JAMES J. LING* □ GIFFORD K. JOHNSON* □ CLYDE SKEEN* □ R. C. BLAYLOCK* □ LEE D. WEBSTER □ W. P. THAYER, President, Chance Vought Corp., Dallas, Texas □ J. O. WELDON, President, Continental Electronics Manufacturing Company, Dallas, Texas □ D. H. BYRD†, D. H. Byrd Enterprises, Dallas, Texas □ V. A. DAVIDSON, M. D.*, Real Estate and Investments, Dallas, Texas □ R. B. GILMORE†, Senior Vice President, DeGolyer & MacNaughton, Dallas, Texas □ LeVAN GRIFFIS, Ph.D., Dean of Engineering, William Marsh Rice University, Houston, Texas □ O. R. MOORE, President, American Security Insurance Company, Atlanta, Georgia □ E. J. MOREHOUSE, Vice President, Harriman Ripley & Co., Incorporated, New York, New York □ W. H. OSBORN, Jr., Partner, Lehman Brothers, New York, New York □ TROY V. POST, President, American Life Insurance Company, Dallas, Texas □ L. T. POTTER*, President, Lone Star Gas Company, Dallas, Texas □ *Executive Committee □ †Executive Committee Alternate Members.	TRUSTEES, CONVERSION AND PAYING AGENTS 51/4% Convertible Subordinated Debentures: Republic National Bank of Dallas, Dallas, Texas 51/2% Subordinated Convertible Debentures: Bank of America National Trust and Savings Association, Los Angeles, California. TRUSTEES First Mortgage 51/4% Sinking Fund Bonds: The First National Bank of Fort Worth, Fort Worth, Texas. GENERAL COUNSEL Thompson, Knight, Wright & Simmons, Dallas, Texas. AUDITORS Ernst & Ernst. Common Stock listed on the New York Stock Exchange.
OFFICERS OF THE COMPANY ROBERT McCULLOCH, Chairman of the Board and Chief Executive Officer JAMES J. LING, Vice Chairman of the Board and Chairman of the Executive Committee GIFFORD K. JOHNSON, President CLYDE SKEEN, Executive Vice President R. C. BLAYLOCK, Vice President and Technical Director LEE D. WEBSTER, Vice President, Secretary and Treasurer J. J. KERLEY, Vice President and Controller. 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.	NOTICE TO STOCKHOLDERS: The Annual Meeting will be held at the Company's General Office Building at Dallas, Texas, on May 10, 1962 at 10 a.m. Formal notice of the meeting together with the prove
Dallas, Texas ☐ Bankers Trust Company, New York, New York.	notice of the meeting, together with the proxy statement and form of proxy, will be sent to stockholders on or about April 6, 1962.

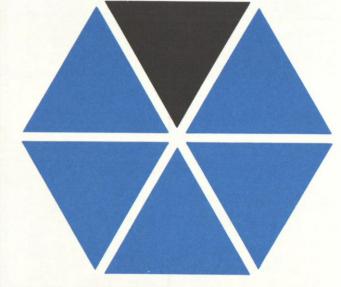


TABLE OF CONTENTS

Officers & Directors .							2
Executive Message							
Current Operational Rev	iev	N.					6
Consolidated Financial S	Sta	ter	ne	nts	;		24
Accountants' Report of I	Exa	ami	ina	tic	n		27



CLYDE SKEEN Executive Vice President



R. C. BLAYLOCK Vice President and Technical Director



LEE D. WEBSTER Vice President, Secretary and Treasurer



J. J. KERLEY Vice President and Controller



W. P. THAYER President Chance Vought Corp.



J. O. WELDON President Continental Electronics Manufacturing Company



D. H. BYRD Diverse Business Enterprises



V. A. DAVIDSON, M.D. Real Estate and Investments



R. B. GILMORE Technical Geoengineering



LeVAN GRIFFIS, Ph.D. Technical Engineering



O. R. MOORE Insurance



E. J. MOREHOUSE Investment Banking



W. H. OSBORN, Jr. Investment Banking



TROY V. POST Banking and Insurance



L. T. POTTER Public Utilities





ROBERT McCULLOCH Chairman of the Board and Chief Executive Officer



JAMES J. LING Vice Chairman of the Board and Chairman of the Executive Committee



GIFFORD K. JOHNSON President

TO THE STOCKHOLDERS:

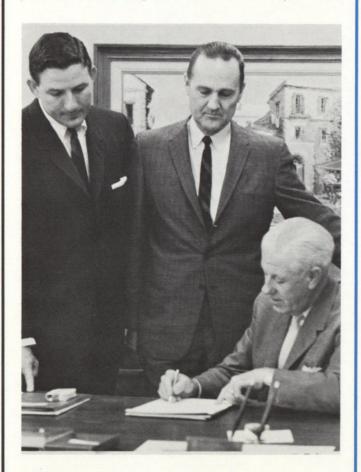
On August 16, Ling-Temco Electronics, Inc. and Chance Vought Corporation were combined to form Ling-Temco-Vought, Inc. The combination has resulted in an organization with virtually unlimited potential as well as proven capabilities in the areas of aerospace, communications and sound systems, military electronics, commercial and other products. The further development of your Company's potential and capabilities is the challenge to your management — a challenge which we face with confidence.

1961 IN REVIEW

The past year has been one of adjustment and consolidation. LTV as it now stands represents the combination of three major organizations,

each with a past history of profitable operation since inception, each having proven capabilities and each having its own distinctive potential for the future. The last four months of 1961 were a period of review, decision-making and action in order to effectively combine these three individual entities into one unified integral force.

At the outset, Management realized that the first step in placing the Company in an affirmative position for future growth was the development of





compatible policies and practices throughout the organization. Your Management immediately embarked upon an intensive review of each operating unit's policies and practices. As a result, it was established that certain financial adjustments necessary to place each operating unit on a common basis should be made and. further, that these adjustments should be made in 1961 rather than program them over a longer period of time. As we have previously reported, your Board of Directors approved these recommendations and extraordinary write-offs in excess of \$13 million were made, to record costs associated with the initial development, tooling and other start-up costs of new products; accumulated research and development costs: restatement of inventory values to reflect anticipated losses on certain production contracts; establishment of a reserve necessary for possible future losses arising from adjustment or disposition of assets: and expense relative to the defense of the legal action brought by the Justice Department.

Primary attention has been given to aligning the Company's organizational structure, molding the many segments of LTV into a unified, integrated team ready to meet the new challenges of the changing times. Realignments within and between divisions have been made in order to make the fullest utilization of existing facilities and talents.

Each of the three major forces from which LTV has evolved had taken its own steps toward diversification. Charting the Company's course for the future, management realized that certain of the more widely diverse subsidiaries and product lines were no longer entirely compatible with our current and future planning. Accordingly, in order to produce a reasonably compact organizational complex which would allow us to pursue and broaden our participation in industry areas in which the Company was firmly established as well as to devote maximum attention to development and improvement of advanced technology

required to anticipate the growing demands of the space age, the decision was made to dispose of certain of the more diverse and incompatible product lines.

It is our pleasure to report that the highly publicized anti-trust suit brought by the Justice Department in connection with the combination of Ling-Temco Electronics and Chance Vought Corporation has been successfully concluded. On November 24, the Court ruled that the combination of the two companies would not in any way lessen competition in the industry, and the case was dismissed on its merits. The Justice Department will not appeal the decision.

FINANCIAL POSITION

Sales for the year were \$192,847,111. After giving effect to the extraordinary write-offs previously mentioned, we have recorded a net loss for the year, after estimated income tax credits, of \$13,158,591, equal to \$4.99 per common share on an average of 2,634,640 shares outstanding during the year. Operations for 1961 include Chance Vought Corporation and subsidiaries for the period of four months from September 1 through the end of the year.

The decision to dispose of certain subsidiaries and product lines, in addition to its favorable effect on the Company's organization structure, results in material improvements in our financial position, particularly with respect to working capital. Although the companies and products involved have contributed approximately \$45 million to annual sales, these operations have resulted in annual losses in excess of \$4 million.

RESEARCH AND DEVELOPMENT

Your management is keenly aware that a key asset of any successful company is its technical capabilities. Tomorrow's business is largely based on the technological studies being made today. We are intensifying our emphasis on research and development through basic research in the broad areas of science, and applied research directed toward improvement of existing products as well as development of new ones. In implementation of this policy, your Company will spend \$10.5 to \$13 million dollars, in excess of \$3.50 per share, on Company-sponsored research and development programs in 1962. Current research programs range from space flight studies to commercial product improvement projects. Although some of these programs will result in new products for the 1962 market, the majority of our research and development is aimed beyond the current year—aimed at products and concepts on which LTV will build its future. It will continue to be our policy to pursue a vigorous research and development program with a view toward acquiring and maintaining a leadership position

in the fields of knowledge required to support our corporate objectives.

1962 FORECAST

Your Company enters 1962 with a backlog in excess of \$300 million. The earnings trend is already apparent in the first quarter, the results of which will be published in the latter part of April. We expect earnings to further improve in the second quarter and to continue improvement, notwithstanding heavy proposed research and development expenditures. The Company's financial position will be further strengthened during the year as cash flow from earnings is utilized to reduce short-term indebtedness.

We have a firm plan for our future growth. We have the facilities, the capabilities and, most important, the people to enable us to carry out our plan. With these people, these capabilities and these facilities, we will meet our challenge. LTV faces the future with confidence—confidence that the major decisions made in 1961 place the Company in a stronger than ever position for future growth; confidence that our intensified efforts in research and development are the key to our future growth; and continued confidence in the support of our employees and stockholders.

Robert McCulloch Chairman

James J. Ling Vice-Chairman of the Board

of the Board

Gifford K. Johnson

President

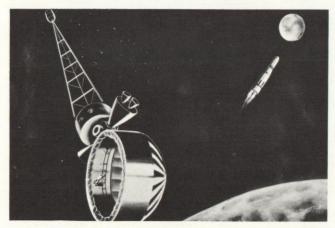


In today's rapidly changing world the key to success is technical competence. In keeping with the challenging character of the times, LTV's policy is to provide, in its research and development efforts for both design and production, sufficient technical skills, methods, facilities, and financial support to explore new concepts, obtain design data, and develop products with sufficient lead time to insure a continuous flow of business.

The Company's extensive and well-staffed research and development facilities are coordinated to bring the full resources of the corporation to bear on the challenging requirements to extend the broad spectrum of technologies required by LTV's many enterprises.

LTV comprises two dozen major production facilities, valued at \$40,000,000, encompassing more than 6,000,000 square feet of floor space, and staffed by 18,000 employees, and can best be described in terms of four major marketing areas: Aerospace, Communications & Sound Systems, Military Electronics, and Commercial & Other Products.

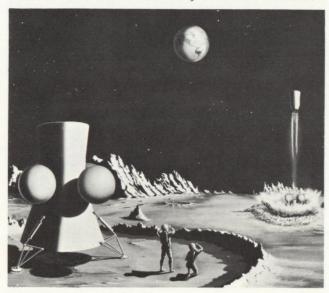
The Company's broad range of activities and proven abilities to conceive, design, develop, and produce—coupled with dedication to reliability and durability, cost consciousness, and schedule fidelity—are demonstrated clearly in the following paragraphs.



LTV studies, under contracts, orbital launch operation techniques involving orbiting space stations, rendezvous véhicles.



Company concepts encompass self-maneuvering personnel units for launch vehicle assembly on orbital rendezvous.



Proposed lunar landing modules carry fuel tanks for return to earth orbit before re-entering atmosphere, completing mission.

AEROSPACE

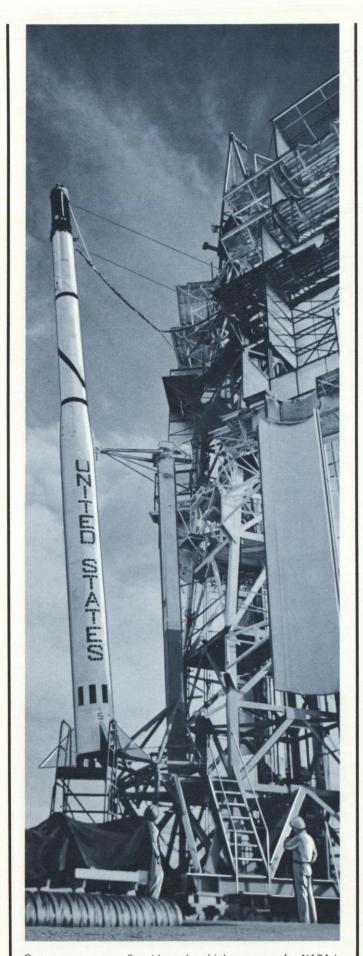
LTV contributes substantially to the aerospace industry's research, development, and production of major manned and unmanned vehicles and systems for the exploration of space and the defense of the Free World.

Today's projects, in which LTV participates, include an important study of the rendezvous of space vehicles, the Scout and Saturn space launch vehicles, the Dyna-Soar space glider, the nuclear-powered SLAM weapons system, the KD2U target missile, the Sergeant, Davy Crockett, and Talos missiles, the tri-service C-142 V/STOL transport, the Navy's supersonic all-weather Crusader fighter, and the RS-70 reconnaissance-strike aircraft.

Tomorrow's programs, now on LTV drawing boards, encompass several contracts involving studies of space launch techniques and the related orbiting space stations and rendezvous vehicles, small but sophisticated long-range missiles, and high performance V/STOL and jet aircraft.



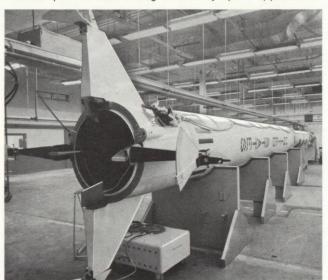
LTV designs and manufactures, under new contract, tri-service vertical take-off and landing transport with *tilt-wing* concept.



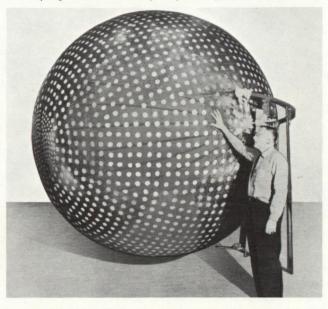
Company manages Scout launch vehicle program for NASA to orbit, probe space with high priority scientific payloads.



Blue Scout vehicles, produced for Air Force, also launch research probes contributing to military space applications.

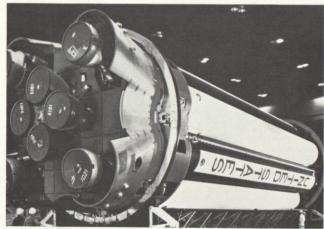


In-plant checkout of all *Scout* systems assures performance to Company's standards of quality and operational reliability.



 $\begin{array}{c} \textit{Explorer IX} \text{ was the first scientific satellite orbited by a solid-fuel rocket--the } \textit{Scout} \text{ produced by Ling-Temco-Vought.} \\ \end{array}$

Company employs modern shear forming techniques to shape metal blanks into Saturn fuel and oxidizer container domes.



LTV fabricates principal components of first stage of liquidfuel Saturn C-1, designed to launch multi-ton space payloads.

LAUNCH VEHICLES: Today's experience with solid- and liquid-fuel rockets qualifies LTV to fulfill tomorrow's requirements for larger space launch vehicles.

As systems manager, LTV is delivering an increasing number of *Scout* vehicles as a result of the National Aeronautics & Space Administration acceleration of high-priority space research projects—re-entry studies and the orbiting of scientific satellites for communications, reconnaissance, and meteorological missions. This year, a *Scout* with a fifth stage motor successfully accomplished a significant re-entry study, adding to last year's performance record when a four-stage *Scout* became the first solid-fuel rocket to orbit a scientific payload and eight other *Scout* launches were accomplished. Future versions of the *Scout* are designed to boost heavier scientific packages into orbit or carry research probes to still higher altitudes.

NASA further recognized the Company's Space Age capabilities in the area of liquid-fuel rockets with \$5,300,000 in contracts for fabrication of huge fuel and oxidizer containers for the Saturn launch vehicle, designed to boost multi-ton payloads into space, in addition to \$19,700,000 in new business for additional Scout vehicles and related services and the design, manufacture, and installation of Scout equipment at the new Pacific Missile Range launch site. Work on both vehicles will continue for some time.

SPACE SYSTEMS: Study programs strengthen engineering capabilities and establish competence for larger projects.

Development of *Dyna-Soar* nose caps—designed to survive the highest re-entry temperatures—continues as a major space flight vehicle research and production project. Proposals embrace *Satellab* for major manned orbital studies in addition to several designs for all systems required in the rendezvous technique.

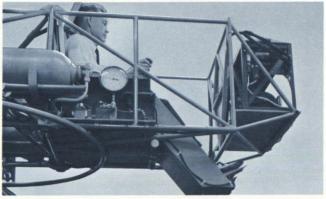
Acutely aware of the man in the spacecraft, the Company's contracted and in-house studies include an emergency detection and capsule escape system, a hardshell astronaut restraint and protection system designed to withstand shocks six times the force of gravity, and an advanced crew seat. Flight control system requirements for manned and unmanned lunar landings also are being studied.



Research & development provides kinetics technology, heatresistant materials required to produce Dyna-Soar nose caps.



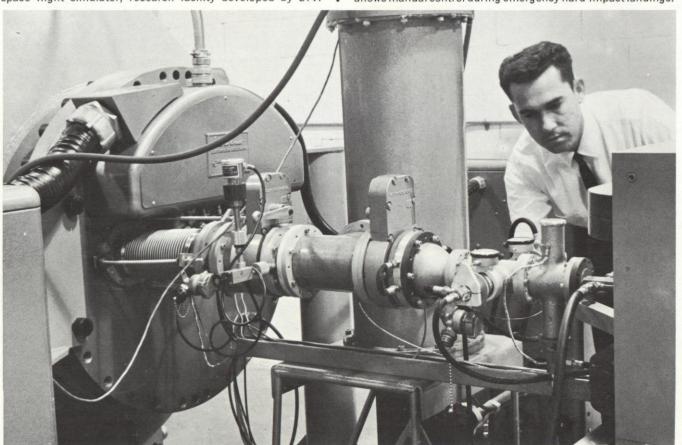
Space-suited astronaut begins realistic mission in manned space flight simulator, research facility developed by LTV.



Researchers employ ACES, automatic controls evaluation simulator, LTV-engineered, to develop spacecraft control systems.



Company-designed astronaut restraint and protection system allows manual control during emergency hard-impact landings.



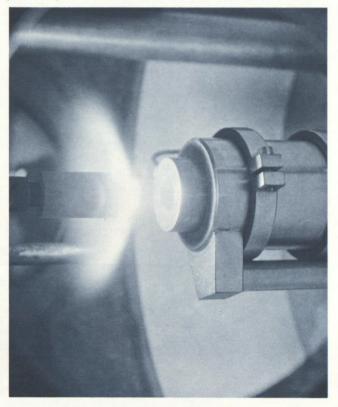
Nuclear scientist adjusts beam of proton particles generated by the Company's new Van de Graaff Accelerator for research.

SPACE SERVICES: Design, development, and installation of the space-on-earth facility has given LTV unsurpassed capabilities to study the requirements of space exploration projects. The manned space flight simulator provides all the visual and movement sensations an astronaut would experience on orbital, lunar, or planetary flights. The space environment simulator duplicates, in a chamber large enough to house complete space vehicles, the vacuum and heat conditions to be encountered in space. The automatic controls evaluation simulator enables the development of control systems in all axes for spacecraft.

The Company's new three-million-electron-volt *Van de Graaff* atomic particle accelerator facilitates research into the effects of the space radiation environment and the intense radiation fields associated with advanced nuclear reactors, providing information about materials and components for application in spacecraft and nuclear-powered vehicles. The 180-kilovolt *Gianini Plasmatron* provides temperatures of 25,000 degrees Fahrenheit, enough to vaporize any known material, to allow investigations of re-entry temperatures and of the heat generated by rocket and jet engines and motors and by other propulsion systems. Thermodynamic properties of air and other gases at temperatures up to 180,000 degrees F. are being studied.



Gianini Plasmatron, new LTV research facility, emits plasma jet at high temperatures, simulates re-entry environment.



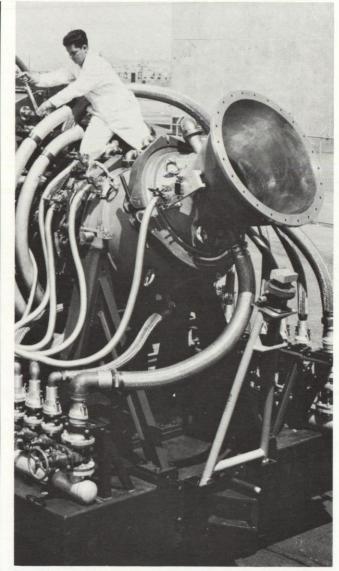
Homogeneous graphite, new space material under development by LTV, alters molecular structure in plasmatron's heat.

MISSILES: Experience with more sophisticated systems has greatly broadened capabilities and focused attention on future requirements. Conceptual and proposed missiles range from drone targets to air-to-air missiles, battlefield weapons, and intermediate range ballistic missiles. The missile technology developed by the Company embraces many means of propulsion and many guidance systems to accomplish specific mission requirements. SLAM, the nuclear-ramjet-powered hypersonic low-altitude weapons system concept, remains an important research and development program, with additional funds provided in both the fiscal 1962 and fiscal 1963 budgets. The Tory IIA nuclear power plant proposed for SLAM was successfully tested last October in Jackass Flats, Nevada.

AIRCRAFT: Although missiles eventually will assume the major roles in the nation's offensive and defensive forces, manned aircraft will remain the back-bone of U. S. aerospace power.

For example, the F8U-2NE all-weather fighter, seventh in the supersonic *Crusader* series of Navy aircraft, succeeded the F8U-2N in production with new orders totaling \$58,000,000 and extending production schedules through 1963. Currently, the *Crusader* is being evaluated as an interceptor for allied air forces, and a tandem two-place supersonic trainer prototype, eighth in the *Crusader* series, is being evaluated by the Navy.

Highlighting the Company's ability to profit from research and development investments is the recent contract award to develop, in association with Hiller and Ryan, the tri-service C-142 V/STOL transport, designed to take off and land vertically, cruise 200 to 300 nautical miles with 8,000-pound payloads at speeds of 250 to 300 knots. Conceived as a multipurpose aircraft with commercial as well as military potential, the C-142 is scheduled for \$52,500,000 in business through fiscal year 1965.



Tory IIA nuclear power plant, proposed propulsion unit for LTV SLAM weapons system, undergoes tests in heavy shielding.



F8U-IT, two-seated trainer version of the *Crusader*, takes off on its maiden flight from the Dallas Naval Air Station runway.

SUBCONTRACTING: LTV's extensive experience and facilities serve other prime contractors in the fabrication of giant vertical and horizontal stabilizers and brazed stainless steel honeycomb panels for the 2000-miles-an hour RS-70 strike and reconnaissance aircraft and its J-93 engine, and B-52, P3V, C-130, and P2V-7 components. Missile subcontracting includes components of the Navy's *Talos* and the Army's *Davy Crockett* systems and the complete erector-launcher for the *Sergeant*.

MANAGEMENT SERVICES: Weapons systems programs develop profitable management capabilities. With a decade of experience in advanced missile testing projects, LTV installs, maintains and operates missile range telemetry and tracking equipment. In addition, the Company provides target missile services.

Under a \$7,600,000 contract extending through September, 1963, LTV manages Pacific Missile Range stations at Barking Sands and Kokee Park (tracking Mercury orbital flights) on the Hawaiian Island of Kauai, and on Kwajalein Atoll, and services the Kwajalein Defense Communications Agency network link. The nation's eyes will be on Kwajalein this spring when the Nike-Zeus system, including the LTV-produced acquisition radar transmitter, will be tested against ICBM targets. Management services also are provided for Navy surface-to-air missile development and training programs at the Naval Missile Center, Point Mugu, California, and in the Caribbean Sea at Roosevelt Roads, Puerto Rico.

LTV developed *TRACE*, an electronic data processing status-reporting methodology for task reporting and current evaluation of complex manufacturing and construction programs. As the most comprehensive system developed, *TRACE* can be programmed to include the data required by *PERT* or *critical path* techniques, as proven in the Company's contract with the U. S. Corps of Engineers Ballistic Missile Division in construction of *Titan I* missile bases.



LTV tracking, telemetry, and communications equipment covers Range Tracker superstructure for mid-sea test data.



Company technicians operate Pacific island tracking and telemetry stations in missile test and space flight operations.



Sergeant missile erector-launcher, completely constructed by Company, reflects versatility of sub-contracting capabilities.



COMMUNICATIONS & SOUND SYSTEMS

LTV contributions to the advancement of superpower communications in three dimensions, on earth, in the sea, and in space, are unparalleled. The Company's equipment now serves in almost every area of communications.

Today's projects, representing advanced research and development in super-power and high-power electronics, include radar transmitters for *BMEWS* and *Nike-Zeus*, radio systems for the *Polaris* program, sonar gear for nuclear submarines and *Project Artemis*, public address systems for missile bases and airports, and display systems for defense communications networks.

Tomorrow's programs, underway in radiation laboratories, screen rooms, and anechoic chambers, encompass the application of quantum electronics technology to super-power communications, sound communications systems, and the employment of acoustic and electro-magnetic phenomena in the advancement of underwater and space communications.

RADAR: LTV developed and is manufacturing the most powerful radar transmitters ever produced.

These transmitters, used in the ballistic missile early warning system (*BMEWS*), provide instant detection and warning of attack by enemy intercontinental ballistic missiles. *BMEWS* became operational during 1961 at Site I, Thule, Greenland, and at Site II, Clear, Alaska. LTV transmitters for the third *BMEWS* site, at Fylingdales Moor, Yorkshire, England, will become operational in 1962.

As a result of this success, the Company has been awarded a contract to design, develop, manufacture, install, and test long-range acquisition radar transmitters for the Army's *Nike-Zeus* ballistic missile defense system.

Similar transmitters power radar telescopes at Stanford University and the MIT'S Millstone Hill Laboratories and radar research station at El Campo, Texas, tracking satellites and space probes and sending signals across such astronomical distances as the 56,000,000 miles to Venus. These achievements demonstrate the vital part radar plays in the exploration of space. LTV's proven performance in radar indicates its ability to provide advanced space communication systems.

SONAR: LTV continues to exploit its technology in the field of sonar—sound detection of underwater objects. The Company currently is producing sonar amplifiers for nuclear attack submarines and *Project Artemis*, the Navy's largest sonar research program. LTV's sonar and anti-submarine warfare capabilities have been expanded by the acquisition of shipyard facilities.



Company's multi-megawatt electronic equipment requires huge components—transmission line, variometer, helix coil.



Control consoles for world's largest radio station simplify operations, insure reliability of continuous communications.



LTV's 50-kilowatt commercial broadcast transmitter fills FCC requirements for unattended operation of radio equipment.

RADIO: LTV proves to the world its broad range of capabilities from the world's most powerful radio station (the Navy's 2,000,000-watt fleet communications installation at Cutler, Maine) to small automated FM broadcast stations.

The VLF station in Cutler provides continuous communications with Navy units throughout the world, even with submerged submarines. As prime contractor, the company completed the Cutler installation one full year ahead of schedule. Engineering of two similar radio stations continues after the Company successfully acquired both of the large contracts that became available through competitive bidding last year. Located in North England, one station will serve the NATO navies. A somewhat larger installation will provide primary fleet communication systems for the U.S. Navy in the Pacific. Related to the Polaris program, these stations have been accompanied by new shipboard and shorebase requirements for smaller VLF equipment. LTV has obtained the first installment of these contracts.

Scheduled for completion by the Company this year is the installation in Greenville, North Carolina, of the newest and most powerful *Voice of America* broadcasting complex, supplementing previous U. S. Information Agency installations of LTV equipment. Under contract, the Company's first 1,000,000-watt commercial transmitter is being produced for a foreign market.

Increasing power and decreasing size and complexity through research and development, LTV's radio technology will continue to meet the demands of military, commercial, and export markets. These demands range from the most powerful single sideband transmitter, capable of generating 600,000 watts peak power, to the most powerful airborne transmitter, operating on 10 kilowatts.



U.S. Information Agency utilizes LTV 1-million-watt shortwave transmitters to blanket world with *Voice of America* programs.

SOUND SYSTEMS: Producer of the finest available sound systems and components, LTV explores the many dimensions of acoustic science.

The Company markets one of the most complete lines of public address and commercial sound equipment, embracing complete theater sound systems, speech input systems, microphones, loudspeakers, and industrial amplifiers. Specialized loudspeakers include explosion-proof models for volatile environments and water-proof units for underwater and unusual climatic installations.



Newest high fidelity sound tuner-amplifier is designed for growing FM multiplex stereophonic radio broadcasting market.

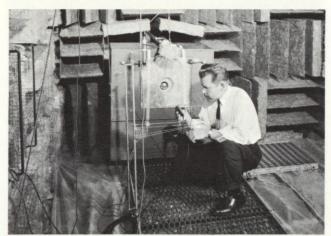


Theater sound system control console produced by Company assures uniform distribution of complex movie acoustic effects.

New products for military and civil defense alert and warning applications are the *Big Voice* system designed to cover large areas with high intensity sound and intelligible speech and *NOALA*, a paging and announcing system that automatically adjusts its volume level according to ambient noise.

LTV also produces the finest high fidelity speakers, amplifiers, and tuners, all of professional quality with a reputation for superior service, for the home. Federal Communications Commission approval of FM multiplex stereophonic broadcasting strengthens the market for newly-designed stereophonic equipment.

Continuing to refine and expand these product lines, the Company will maintain its superior reputation in the sound systems field.



Sound baffles, insulation materials in anechoic chamber purify acoustics for sound system research, development projects.

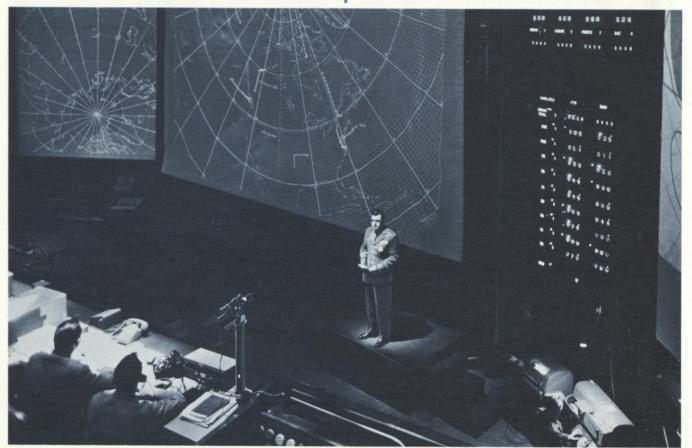


Complete home sound reproduction center provides finest fidelity in handsome cabinets, earns superior reputation for LTV.

DISPLAY SYSTEMS: Modern communications systems employ highly compressed codes to transfer information rapidly from one geographic location to another, and the need for a system to translate this code into understandable symbols is being answered by LTV's *Iconorama*, an electronic system for visually displaying communications data. *BMEWS* information is displayed on *Iconorama* screens at the headquarters of NORAD (North America Air Defense Command) in Colorado Springs, Colorado, the Strategic Air Command near Omaha, Nebraska, and the Joint Chiefs of Staff in the Pentagon, Washington, D.C.



Iconorama projectors, behind the NORAD operators, work automatically to display data detected by LTV's BMEWS radars.



LTV-developed *Iconorama* continuously displays current aerospace defense information in busy NORAD Operations Center.

MILITARY ELECTRONICS

LTV's contributions to aerospace and communications technology are made even more meaningful with the development of sophisticated electronic equipment for aerosystems, flight control and guidance, special purpose computers, electronic warfare, aerospace and communications support, and high reliability components.

Today's projects, derived from research and development, include aerosystems for classified projects, aerodynamic control and guidance systems and components for the *Saturn*, *Minuteman*, *Dyna-Soar*, Boeing 727 and *Crusader*, digital timing computers, classified electronic warfare systems, and support equipment for *Scout* and other space programs.

Tomorrow's programs, taking shape on engineering bread boards, encompass a new guidance principle which may challenge the gyroscope, the direct conver-

AEROSYSTEMS: An example of successful research and development is reflected by the growth of the Company's aerosystems operation into one of its largest enterprises, with a quick reaction capability in the design and production of special purpose equipment for the military airborne electronic systems market. Current programs embrace the AN/USD-7 project—with LTV serving as systems integrator and performing the installation and flight testing phases

sion of nuclear and/or chemical energy to electricity, and new vacuum switches capable of interrupting higher

voltage and ampere ratings than any previous switch.

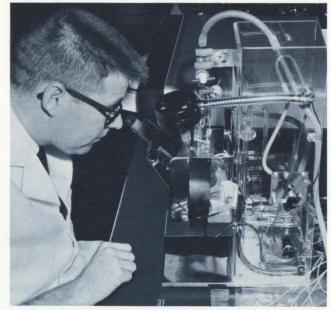
of this highly classified electronic system program—and airborne systems for missile tracking, under both Air Force and Navy contracts. The Company's specialized skills and experience in airframe, power plant, and aircraft system modification are uniquely suited for this growing market.



Close-up reveals intricateness, neatness of work in assembly of components of complex electronic system produced by LTV.



Detail assembly workers participate in production of many of Company's electronic systems, sub-systems, and components.

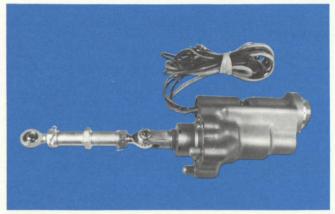


Quality control technicians with Company-developed electrooptical instrument counts dust particles in hydraulic oil.



Clean room assembly assures performance reliability of guidance, automatic control elements is higher than required.

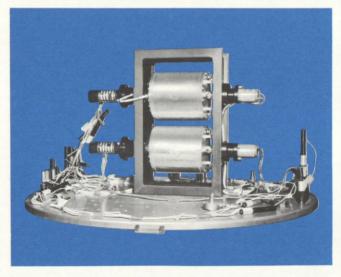
FLIGHT CONTROL & GUIDANCE SYSTEMS: The Company's flight control and guidance technology, developed in aircraft and missile engineering and production, is now extending into space projects. Current programs range from simple aircraft control damping devices to complex computer guidance systems. Digital servo actuators for all three stages of the solid-fuel *Minuteman* intercontinental ballistic missile, a feel system for the Boeing 727, and components of the *Dyna-Soar* guidance system are in production.



LTV-designed servo digital actuators for all four stages of $\it Minuteman \, ICBM$ insure quick reaction after long silo storage.

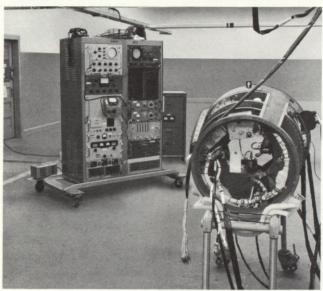


Crusader autopilot features interconnected dual system, assures continuous flight performance, in compact package.



Twin gyro controller, designed by the Company, offers revolutionary stabilization concept for spacecraft applications.





Designed to completely check out space launch vehicles, electronic blockhouse equipment must itself pass exacting tests.

ELECTRONIC WARFARE: Highly refined and specialized communications capabilities, supplemented by competence in other electronic areas, provide the Company with demonstrated abilities in the exotic and esoteric fields of counter-measures, penetration aids, etc. All of this activity is classified, but it can be said that growth in these markets is assured.

SUPPORT SYSTEMS: From *Scout* simulators, blockhouse equipment, test and checkout systems to new servo-analyzers to be introduced in mid-1962, activities in this area insure LTV standards of excellence will be incorporated in the entire aerospace system. These programs require extensive sheet metal fabrication and machining operational areas, springing from the Company's basic capabilities.

LTV's unparalleled electronics abilities and facilities will continue to spark the Company's growth.



Million-dollar Radiation Laboratory serves as main research and development facility for electronics and communications.



Radiation Laboratory equipment meets all requirements for checking, calibrating RF patterns, phenomena, performances.



LTV Central Control Unit activates all dry-cleaning machines, washers, and dryers in the coin-operated consumer laundry.

COMMERCIAL & OTHER PRODUCTS

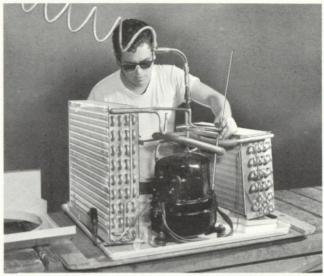
LTV contributes to rising standards of living with quality products developed especially for diversified commercial markets.

Today's products, based on practical invention and ingenuity advanced by science, include *FloatingAir* air-conditioning and refrigeration equipment, acoustical and electrodynamic environmental test systems, marine products, logistical vehicles, and such advanced materials as *Thermosorb*, developed especially for space applications.

Tomorrow's goods and services, taking shape as prototypes in model shops and laboratories, encompass air-conditioning and refrigeration equipment incorporating the newest technologies of electrical conversion and the science of kinetics, more powerful environmental test system components, and such new materials as homogeneous graphites.

AIR CONDITIONING & REFRIGERATION: Many scientific breakthroughs and advancements of the state-of-the-art have been required in this business during the past 80 years, and most of them were accomplished under the *FloatingAir* trademark. Even competitors admit that LTV manufactures and markets the quality product in the areas of unitary air-conditioning systems, room air-conditioning units, commercial refrigerators, and refrigerated food display modules.

With a good share of the markets for each of these products on a regional basis, the Company is expanding its marketing efforts to accommodate increasing national demand.



Quality inspections of each component of Company air-conditioning equipment insures continued leadership in this field.



Refrigerated food display units produced by LTV are recognized by industry as the best available on the market.



FloatingAir unitary air-conditioning systems produced by the Company establish the standards of excellence in this market.



ENVIRONMENTAL TEST SYSTEMS: Pioneers in electrodynamic and acoustical environmental testing, the Company has extended its technologies into the area of combined environments to assure performance reliability of spacecraft, missiles, and aircraft. Achievements in this area serve as an example of how commercial enterprise can enhance governmental development and production programs.

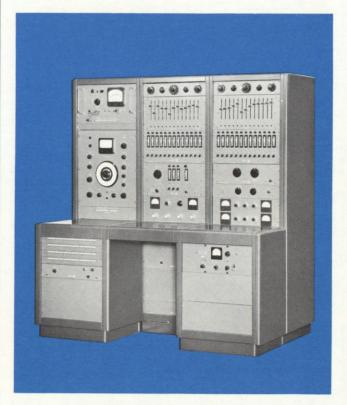
LTV, producer of the world's largest electrodynamic vibration systems, continues to meet increasing aerospace industry demands in the testing of space

LTV produces most complete line of electronic environmental testing equipment, including largest vibrators, or *shakers*.

vehicles under severe conditions associated with outer space environments.

The high intensity sound plane wave tube and electropneumatic transducers developed for environmental testing represent significant breakthroughs in sound engineering. The radically-new patented X-armature electrodynamic vibrator, or shaker, allows tests of critical components of space vehicles, missiles, and aerospace assemblies, at extremely high, heretofore unattainable, "g" levels.

The thruster cluster technique, a new concept of force application, provides forces of 100,000 pounds or greater, instigating a major change in environmental test philosophies.



The Company's environmental testing equipment line has items for scientific studies such as this equalizer-analyzer.

MARINE PRODUCTS: Facilities for ship- and boatbuilding add to LTV's competence as a producer of vehicles for the government and industry, especially in the growing anti-submarine warfare field, oceanography, and the mid-sea tracking and telemetry of missiles and space vehicles. These capabilities are broadened by the Company's experience in integrating comprehensive electronic systems, including radar, radio, and sonar, in marine vehicles.

NEW MARKETS: From a new generation of *brushfire* war logistical vehicles to electro-optical fingerprint systems designed to revolutionize identification techniques, LTV seeks the markets of the future. *Gama Goat*, a 1¼-ton, twin-bodied, six-wheeled automotive vehicle providing a modern concept of battlefield mobility, has attracted international military interest. Another military vehicle, *PAT* (plenum air track), designed to operate on hard surfaces, water, snow, mud, or tundra, also is being developed under an Army contract.

LTV will continue to diversify and expand its commercial and other products, introducing improvements in its traditional product lines as well as new goods and services.



Gama Goat, designed to cope with rough terrain, demonstrates its ability to carry troops and supplies almost anywhere.



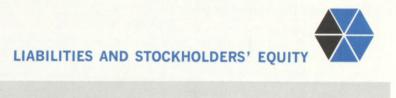
PAT, another newly-designed military vehicle, employs inflated rubber tracks to roll across obstacles deemed *impassable*.

CONSOLIDATED BALANCE SHEET - Note A

LING-TEMCO-VOUGHT, INC. AND SUBSIDIARIES December 31, 1961



CURRENT ASSETS		. 7.106.010
Cash and temporary cash investments		\$ 7,426,013
- Note B		37,777,190
Unreimbursed costs and fees under cost plus fixed fee contracts (including due from U. S. Government \$15,347,782)—Note B. Refundable federal taxes on income—estimated		21,589,736 1,828,160
Inventories, generally at average cost, not in excess of market —Note B:		
Finished products	\$ 8,010,029 53,923,949 23,357,735	
Naw materials and parenased parts	\$ 85,291,713	
Less progress payments received	31,603,527	53,688,186 1,340,892 \$123,650,177
		Ψ120,000,177
INVESTMENTS AND OTHER ASSETS Investments in unconsolidated finance subsidiaries and affiliated companies—Note A	\$ 3,266,628 2,426,840 1,396,756	7,090,224
PROPERTY, PLANT, AND EQUIPMENT—at cost—Note C		
Land	\$ 1,175,913 10,897,553 40,547,089	
Less allowances for depreciation	\$ 52,620,555	40.010.070
Less allowances for depreciation	11,800,683	40,819,872
INTANGIBLES, less amortization Excess of investment in subsidiaries over net assets acquired		0.007.267
Patents and trademarks	749,987	2,227,367
UNAMORTIZED DEBT EXPENSE		354,494
		\$174,142,134



CURRENT LIABILITIES Notes payable to banks—Note B		\$ 48,600,000 25,861,460 12,634,619 523,568 \$ 87,619,647
LONG-TERM DEBT—Note C Subordinated debentures	\$ 56,880,913 5,147,090 2,920,000	64,948,003
RESERVES For deferred federal taxes on income	\$ 528,813 2,450,000	2,978,813
MINORITY INTEREST IN SUBSIDIARY COMPANIES STOCKHOLDERS' EQUITY 4½% Series A preferred stock, par value \$30 a share—Notes D, E, and F: Authorized 1,000,000 preferred shares; issued and outstanding 153,700 shares	\$ 4,611,000 1,387,593 5,752,556 6,165,445	679,077 17,916,594
COMMITMENTS AND CONTINGENCIES—Note G		

\$174,142,134

STATEMENTS OF CONSOLIDATED CAPITAL SURPLUS AND RETAINED EARNINGS—Note A

LING-TEMCO-VOUGHT, INC. AND SUBSIDIARIES Year ended December 31, 1961

CAPITAL SURPLUS

Balance at beginning of year	. \$ 2,238,853
xcess of principal amount over par value of common and preferred shares issued upo conversion of subordinated convertible debentures	
xcess of par value of preferred stock over par value of common shares issued in conversion	. 1,270,005
xcess over par value of proceeds from sale of common and preferred stock under option plans	354,686
Palance at end of year	. \$ 5,752,556



RETAINED EARNINGS

Balance at beginning of year	036
Net loss for the year	591
Balance at end of year—Note C	145
See notes to financial statements.	

STATEMENT OF CONSOLIDATED OPERATIONS—Note A

LING-TEMCO-VOUGHT, INC. AND SUBSIDIARIES Year ended December 31, 1961

Net sales, including costs and fees under cost plus fixed		
fee contracts		\$192,847,111
Other income		883,371
		\$193,730,482
Costs and expenses (including depreciation and amortization of		
property, plant, and equipment, \$3,388,338):		
Manufacturing costs	\$186,087,936	
Selling, administrative and general expenses	17,217,969	
Interest expense	3,732,306	
Other expenses (including provision of \$1,000,000 for losses		
on adjustment or disposition of assets)	1,219,168	208,257,379
LOSS BEFORE INCOME-TAX CREDIT		\$ 14,526,897
		4 - 1,020,007
Estimated federal income - tax credit,		
less \$29,173 state income taxes		1,368,306
NET LOSS		\$ 13,158,591
See notes to financial statements.		
occ notes to infancial statements.		

ACCOUNTANTS' REPORT OF EXAMINATION

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, 1961, and the related statements of consolidated operations, capital surplus 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, giving effect to the transaction described in Note A to financial statements, the accompanying balance sheet and statements of operations, capital surplus and retained earnings present fairly the consolidated financial position of Ling-Temco-Vought, Inc. and subsidiaries at December 31, 1961, and the consolidated results of their operations for the year then ended, in conformity with generally accepted accounting principles which, except for the change (in which we concur) referred to in Note H to financial statements, have been applied on a basis consistent with that of the preceding year.

ERNST & ERNST

Dallas, Texas March 27, 1962

NOTES TO FINANCIAL STATEMENTS

LING-TEMCO-VOUGHT, INC. AND SUBSIDIARIES December 31, 1961

NOTE A - PRINCIPLES OF CONSOLIDATION

The consolidated financial statements include the accounts of the Company and its subsidiaries, except its wholly-owned finance subsidiaries. The Company acquired all assets and assumed the liabilities of Chance Vought Corporation effective August 31, 1961, and accordingly the operations of Chance Vought Corporation and its subsidiaries are included in the financial statements since date of acquisition. During 1962 one of the Company's subsidiaries was sold, as of November 30, 1961, for cash, notes and accounts receivable, and capital stock of another company. This transaction has been given effect to in the accompanying financial statements, and the accounts of the subsidiary subsequent to November 30, 1961, have been excluded from such financial statements.

The investment (\$2,972,625) in unconsolidated finance subsidiaries is carried at cost adjusted for accumulated earnings, and the investment (\$294,003) in affiliated companies is carried at cost which represents the approximate equity.

NOTE B - LOAN AGREEMENT WITH BANKS

Under the terms of a loan agreement expiring September 30, 1962, the Company may borrow up to \$60,000,000 (\$48,600,000 of such borrowings are reflected in the consolidated balance sheet at December 31, 1961). Trade receivables, unreimbursed costs and fees under cost plus fixed fee contracts, and inventories assigned as collateral to the loans as of December 31, 1961, aggregated \$28,137,000, \$13,302,000, and \$8,674,000, 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 C - LONG-TERM DEBT AND DIVIDEND RESTRICTIONS

Long-term debt at December 31, 1961, consists of the following:

Description	Balance due beyond one year
5½% Subordinated convertible debentures due September 1, 1976	\$53,272,913
October 1, 1971	3,608,000
6¼ % Senior notes due December 1, 1974	5,000,000
5½% First mortgage sinking fund bonds due August 1, 1970	2,920,000
Sundry mortgage notes payable	147,090
	\$64,948,003

Annual maturities and sinking fund requirements during the next five years range from \$523,568 to \$1,066,324.

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, 1961, and \$10,658,591 of future earnings are restricted as to use for payment of dividends (other than in capital stock of the Company) or for purchase, redemption, or other retirement of the Company's capital stock.

NOTE D - 41/2% SERIES A PREFERRED STOCK

There are 1,000,000 shares of Series preferred stock, \$30 par value, authorized, of which 252,000 shares of $4\frac{1}{2}\%$ Series A preferred stock were authorized at December 31, 1961. The preferred stock is convertible into common stock on a share-for-share basis to June 30, 1965. 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 $4\frac{1}{2}$ % of its par value of \$30. Dividends are cumulative and payable before any dividends are paid on common stock.

NOTE E - COMMON AND PREFERRED STOCK RESERVED

At December 31, 1961, the Company had reserved shares of its capital stock as follows:

	COMMON STOCK			ERIES A ED STOCK
RESERVED FOR	Number of Shares	Price Per Share	Number of Shares	Price Per Share
Conversion of 5½% debentures	1,530,831	\$34.80(1)	_	_
Conversion of 51/4 % debentures	97,679	29.55(2)	24,420	\$29.55(2)
Warrants expiring December 1, 1969, issued	52,268	31.57 and	_	_
with 6¼ % senior notes Warrants expiring August 31, 1966,	15,090	32.80(3)	-	-
issued upon purchase	204,378	30.00	_	_
of Chance Vought assets	204,378	40.00	-	_
Conversion of preferred				
stock into common stock	178,120	-	-	_

Reference is made to Note F concerning shares of capital stock reserved for option plans.

- Conversion price of 5½% debentures is \$39.54 after August 31, 1966.
- (2) Conversion price of $5\frac{1}{4}$ % debentures is \$32.30 after October 1, 1966.
- (3) Exercise price for certain warrants (15,090 shares) with 61/4% senior notes is \$37.77 after December 1, 1964. All prices are subject to adjustments for anti-dilution provision.

NOTE F — OPTIONS TO PURCHASE COMMON AND PREFERRED STOCK

Stock option plans of the Company provide for granting restricted stock options to officers and employees of the Company and its subsidiaries. Under the plans, 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. At December 31, 1961, the Company had reserved under all plans an aggregate of 348,560 shares of common stock and 14,814 shares of 4½% Series A preferred stock, of which 342,510 common shares and 14,094 preferred shares were issuable at option prices aggregating \$8,653,371. In connection with the purchase in 1961 of the assets of Chance Vought Corporation, the Company assumed the existing plan of Chance Vought, and options to purchase 73,334 shares of the Company's common stock at option prices aggregating \$2,205,794 were substituted for options outstanding under such plan at the time of purchase. No further options will be granted under the Chance Vought plan, and none of such options were exercised or cancelled during 1961. Under the Company's other plans during 1961, 17,664 shares common and 666 shares preferred were issued at option prices aggregating \$339,013; options for 2,668 shares common and 492 shares preferred were cancelled or forfeited, and options were granted for 58,500 shares of common stock at option prices aggregating \$1,523,625. Unoptioned shares under the plans at December 31, 1961, aggregated 6,050 shares of common and 720 shares of preferred stock.

In addition to the foregoing, at December 31, 1961, options covering 23,781 shares of the Company's common stock at option prices aggregating \$487,511 were outstanding as a result of options granted in 1960 which did not fall within the definitions of the Company's restricted stock option plans. During 1961, certain of these options covering 11,217 shares were cancelled.

NOTE G - COMMITMENTS AND CONTINGENCIES

Certain sales for 1960 and 1961 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 are contingently liable for customer indebtedness guarantees aggregating approximately \$4,400,000.

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 be able 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 January, 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 not less than \$540,000.

NOTE H - CHANGE IN ACCOUNTING METHOD

During 1961, the Company adopted the policy of charging research and development and starting costs of new products to expense as incurred. As a result of this change, the net loss for 1961 was increased by approximately \$3,000,000.

NOTE I - PENSION PLANS

Under pension plans in effect at December 31, 1961, the estimated annual cost, including amortization of past service costs, amounts to approximately \$5,000,000. Provisions for amortization of past service costs have been based upon funding such costs over a twenty-year period. Estimated unpaid past service costs at December 31, 1961, amounted to approximately \$2,800,000.

NOTE J - FEDERAL INCOME-TAX LOSS CARRY-FORWARD

As a result of the operating loss for 1961, a loss carry-forward in excess of \$11,000,000 should be available for the reduction of future tax liabilities.



DIVISIONS AND SUBSIDIARIES ALTEC LANSING CORPORATION, 1515 South Manchester Avenue, Anaheim, California

PEER-LESS ELECTRICAL PRODUCTS DIVISION, 1515 South Manchester Avenue, Anaheim, California ☐ ALTEC SERVICE COMPANY, 161 Sixth Avenue, New York, New York THE CALIDYNE COMPANY, INC. DIVISION, 120 Cross Street, Winchester, Massachusetts □ 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 ☐ CONTINENTAL ELECTRONICS MANUFACTURING COMPANY. 4212 South Buckner Boulevard, Dallas, Texas □ CONTINENTAL ELECTRONICS SYSTEMS, INC., 4212 South Buckner Boulevard, Dallas, Texas □ CRUSADER FINANCE COMPANY, 7900 Carpenter Freeway, Dallas, Texas □ ELECTRON COR-PORATION, P. O. Box 5570, Dallas 22, Texas ☐ F F & M ELECTRONICS DIVISION, 12820 Panama Street, Los Angeles, California

ED FRIEDRICH INCORPORATED, 1117 East Commerce Street, San Antonio, Texas ☐ FRIEDRICH REFRIGERATORS INCORPORATED, 1117 East Commerce Street, San Antonio, Texas

HAR-BOR 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-ALTEC EXPORT CORPORA-TION, 161 Sixth Avenue, New York, New York ☐ LING-ALTEC RESEARCH DIVISION, 1859 South Manchester Avenue, Anaheim, California ☐ LING-ALTEC WESTERN HEMISPHERE COR-PORATION, 161 Sixth Avenue, New York, New York | LTV RESEARCH CENTER, P. O. Box 5907, Dallas 22, Texas ☐ TEMCO ELECTRON-ICS & 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 ☐ LTV Industrial Division, P. O. Box 6327, Dallas 22, Texas
☐ Micromodular Components Division, 1859 South Manchester Avenue, Anaheim, California

UNITED ELECTRONICS COMPANY, 42 Spring Street, Newark, New Jersey | UNIVERSITY LOUD-SPEAKERS DIVISION, 80 South Kensico Avenue, White Plains, New York.

LING-TEMCO-VOUGHT, INC.



P.O. BOX 5003 DALLAS 22, TEXAS