MEMOREX CORPORATION

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Note: The venture and securities described herein are speculative in nature.

I. DESCRIPTION OF THE MAGNETIC TAPE INDUSTRY

A. What is Magnetic Tape?

Magnetic tape is a recording medium, which permits the accurate recording of electrical signals over an extremely wide frequency range with minimum distortion on reproduction. In lay language, this simply means that tape is able to record huge amounts of information, pictures or sound in a very small space. This information may consist of the millions of electrical pulses per second which constitute the signal of a television picture, the hundreds of thousands of pulses per second which constitute the flow of data into electronic computers, or the hundreds or thousands of pulses per second which record the music of a symphony orchestra.

Magnetic tape is currently the most practical medium available for recording very high frequency information. In lower frequency recording applications, for which other media are available, magnetic tape's cost per bit of information recorded and other performance characteristics usually give it a competitive advantage. A tape recording requires no processing or treatment and so can be reproduced immediately if necessary. Further, the recording operation utilizes the original electrical form of the information recorded, and the playback operation reproduces the information in its original form. It can be reproduced tens of thousands of times without degradation of the information recorded, and, when the record is no longer desired, the tape can be erased or demagnetized and reused. A recorded tape is easily edited and can be simply spliced with other tapes. It is readily transported and stored and maintenance of special environmental conditions is not necessary. In short, without magnetic tape many kinds of information would be either impossible or uneconomic to record, store and transfer.

B. Uses for Magnetic Tape.

All magnetic tape is generally classified as either precision tape or non-precision tape. Precision tapes are distinguished by their uniformity and their superior performance characteristics. Principal markets for precision tape are users of tape for digital data recording in electronic computer and data processing systems, scientific data (analog) recording in various telemetry and test systems, and television picture (video) recording. Markets for non-precision tape are radio stations, recording studios, home music tape recorder users, and other sound (audio) recording applications. The discussion which follows will be restricted to the precision tape markets.

Computer Tape. The electronic computer finds its economic justification in its capacity to perform prodigious time-saving feats of calculation and in its solution of the problem of paperwork's strangulation of business and industry. So great is the market potential for this equipment, that Fortune Magazine recently reported that it could find no major computer systems maker which bothered to do market research.

Magnetic tape is the medium used to feed information into computers and to take information from computers. It is also the medium in which the computer's library of information and permanent records is stored. Consequently, sales of tape for computer use are related to both the annual sales of new computers and to the number of computers in use.

Computer tape sales in 1959 have been estimated at $6 million, and in 1960 at aproximately $9 million.

Analog or Instrumentation Tape. Analog tape is utilized in applications where scientific data must be collected, analyzed, and processed. While non-military applications, e.g. geophysical data recording, cardiovascular and other medical data recording, automated machine tool control, etc., are expanding, most analog tape usage is currently military related. The latter includes acquisition, reduction, and analysis of dynamic data for engineering and scientific purposes; acquisition of telemetry data; acquisition of test data aboard aircraft, missiles, or space vehicles; recording of radar pulses and other electronic intelligence.

Sales of analog tape in 1959 have been estimated at $8.1 million, and in 1960 at $11 million.

Video Tape. Equipment for the tape recording of television did not become commercially available until 1956, and to date its use has been largely limited to commercial television. However, both Ampex Corporation and RCA, the two U.S. manufacturers of video recording equipment, and the leading Japanese manufacturer are engaged in development of second generation videotape recorders to sell for significantly reduced prices. The impact of this development should materially broaden the market for video recording tape among closed-circuit industrial, educational, medical, and military users. Finally, the adaptation of video recording techniques to so-called wideband instrumentation recording (radar and other high frequency data which heretofore could not be recorded), is also opening another significant market for tape.

Sales of magnetic tape for video recording in 1959 have been estimated at $1.2 million and in 1960 at $2.3 million.

Summary. Precision magnetic tape sales in 1959 have been estimated at $6 million computer tape, $8 million analog tape, and $1.2 million videotape, or a total estimated market of $15.1 million. In 1960, the comparable figures have been estimated at $9 million computer tape, $11 million analog tape, and $2.3 million videotape, or a total estimated market of $22.3 million.

C. Factors Affecting Profitability of Precision Tape Manufacture.

Two factors primarily determine the profit margin of a magnetic tape manufacturer: product-mix of sales and production yield. Product-mix of sales refers to the relative percentages of precision and nonprecision tape sold. Production yield refers to the ratio of salable production to unusable production which must be discarded.

There is a very significant disparity in the selling prices of precision and nonprecision tapes, as shown in the table below.

Precision Tapes	Selling Price	Nonprecision Tapes	Selling Price
Television tape	$60	Consumer audio tape	$16
Premium computer tape	65	GSA audio tape	11
Computer tape	46	Unlabeled ("Whitebox") tape	6
Instrumentation tape	34		
GSA instrumentation tape	25		
Master audio tape	39		

(The above comparative selling prices are calculated on the basis of a standard equivalent: a ½" by 2400' roll of tape on Mylar backing wound on a NAB reel.)

The manufacturer of precision tape requires a substantially higher capital investment and engineering maintenance and related plant costs. However, the ratio of such costs to sales of a precision tape manufacturer should be substantially the same as the ratio of similar costs to sales of a nonprecision tape manufacturer because of the higher sales prices of precision tapes. On the other hand, the costs of materials and direct labor which are the principal manufacturing costs in both precision and nonprecision tape manufacturing operations as a percentage of sales should be much less in the case of precision tape operations. Consequently, the margin of profit of a magnetic tape manufacturer should, in large part, be reflected by the extent to which he is successful in competing in the precision tape markets.

The prerequisites of successful competition in the precision tape markets are technical and manufacturing sophistication. Technical sophistication involves knowledge of the use of tape and knowledge of the design of tape. To know what characteristics a precision tape should have, a manufacturer requires a thorough knowledge of recording systems, i.e., the tape and recorder when used together. To know how to design a tape with the desired characteristics, a manufacturer requires a thorough understanding of the chemistry and physics of tape's composition. To manufacture precision tape with uniformly reproducible qualities, a manufacturer requires a high order of process engineering and highly automated and controlled manufacturing.

D. Competition.

The dominant participant in the industry is Minnesota Mining & Manufacturing Company. Total magnetic tape sales by 3M are estimated at $25 million, of which $17 million is believed to be precision tape sales.

Orr Industries, Opelika, Alabama, a division of Ampex Corporation, is estimated to have magnetic tape sales of about $5 million, of which a little more than half is estimated to be precision tape sales.

Audio Devices, Inc. is estimated to have total tape sales of $5.7 million, of which approximately $1 million is estimated to be precision tape sales.

Reeves Soundcraft Corporation is estimated to have magnetic tape sales of $3.9 million, of which approximately $1 million is estimated to be precision tape sales.

3M is believed to enjoy an 85% share of the computer tape market, 100% of the television tape market, 65% of the analog tape market.

Orr Industries is believed to enjoy about 10% of the computer tape market and 20% of the analog tape market.

Several other United States companies have recently commenced manufacture of magnetic tape, but their sales to date (estimated at approximately $2 million in the aggregate) have been limited to nonprecision tape products. In addition, a number of foreign companies have entered the field, but their products have generally exhibited poorer performance characteristics than United State tapes and to date they have posed no significant threat to American manufacturers.

E. Conclusions.

In view of the growing demand for precision magnetic tape—both in terms of its presently established uses and indicated future uses—and the relatively small number of companies presently active in the field, it is believed that there is an opportunity for entry into this industry by an enterprise which possesses the requisite technological skills necessary to produce precision tape. The four founders of Memorex Corporation have determined to undertake such an enterprise, which will have the following objectives:

(1) To concentrate participation in the precision tape markets, i.e., electronic computer tape, instrumentation, telemetry and scientific data recording tape, and television recording tape, and to minimize participation in the nonprecision tape markets.

(2) To utilize automation, extensive instrumentation and control devices, which are necessary to achieve a uniformly reproducible manufacturing process and a high order of quality control.

(3) To make generous appropriations for research and new product development, which may appear to be unusually high by comparative yardsticks, but which the founders believe are necessary to achieve innovation as well as improvement of product and to assure thereby the Company's competitive position and profitability.

(4) To pursue an aggressive marketing program, which is necessary to develop a sizable sales volume in a relatively short period of time and to establish the Company's position in the precision tape markets.

II. FORMATION OF MEMOREX CORPORATION

A. Operating Management and Board of Directors.

(1) **Management.** Management of the Company will include the founders, who are:

Laurence L. Spitters	President and Treasurer
Arnold T. Challman	Vice President-Marketing and Secretary
Donald F. Eldridge	Vice President and Technical Director
W. Lawrence Noon	Vice President-Manufacturing and Engineering

The above individuals resigned from Ampex Corporation in December 1960. Their educational and experience backgrounds indicate complementary qualifications in the four vital areas of corporate activity—research, engineering and manufacturing, marketing, and finance. The founders range in age from 32 to 41, and their business experience averages about 12 years. None enjoys more than modest economic resources, and all are highly aggressive and financially motivated.

Biographical sketches of the founders follow.

Donald F. Eldridge (responsibility: research and quality assurance)

Eldridge is 31 years old, married, 8 children. Graduated with degree of Bachelor of Science in Electrical Engineering from Lehigh University at age 20. Eldridge was employed from 1949 to 1956 by Boeing Airplane Company, Seattle. His work at Boeing was in the area of instrumentation for obtaining dynamic data from field and flight tests of aircraft and in the general area of data acquisition and reduction. During his last three years at Boeing, Eldridge planned and put into operation an integrated system for gathering and reducing magnetic tape recorded data, and supervised the group of engineers and scientists responsible for this work.

With the permission of Boeing, Eldridge formed and became president of Sonic Instrument Company, which from 1954 to 1956 engaged in marketing several inventions in which Boeing had no interest as products. These included rugged high-impedance cathode followers, power supplies, vibration transducers, and an automatic 96-channel bridge-balancing device. Manufacturing was done by a local job shop electronics manufacturer, and a limited national advertising campaign was handled by an agency. Operations were moderately successful, but, the business did not develop the potential for growth or the building of a substantial industry. Hence, when Eldridge resigned from Boeing and left Seattle in 1956, he liquidated his interest.

From 1956 through 1960, Eldridge was employed in the Corporate Research Division of Ampex Corporation. His last responsibility was Manager of the Magnetics Department, whose scope involved all of Ampex's basic research in magnetics and which included supervision of 12 people. Eldridge's research was done on a wide range of subjects

within the magnetics field, which are indicated by the following titles of formal research reports written by him.

A Magnetic Pulse-Width Modulator.
An Investigation of Pulse Detection Methods for Digital Recording.
A New Magnetic Storage Medium.
A Study of Pulse Recording and Reproduction.
The Effects of Track Width on Recording System Performance.
Transverse Recording Study.
New Approaches to A-C Biased Recording.
The Efficiency of Some Reproduce Heads.
Some Data on Single-Pole Heads.
The Application of Information Theory to Recording Systems.

Eldridge has presented technical papers at WESCON (1958), IRE National Convention (1959, 1960), and the Conference on Magnetism and Magnetic Materials (1960). He holds membership in several professional societies, including IRE, AIEE, and APS. He currently holds the position of Acting National Chairman of the Professional Group on Magnetic Recording, which is currently being chartered by the IRE and whose elected membership is generally considered to represent the "Who's Who" of the magnetic tape recording industry.

William L. Noon (responsibility: manufacturing and engineering)

Noon is 35 years old, married, two children. Graduated with degrees of Bachelor of Science in Applied Chemistry and Master of Science in Chemical Engineering from California Institute of Technology. Noon studied electronics in the U.S. Navy during World War II. In recent years, he has completed eleven courses at the University of California, Berkeley, including such diverse subjects as Electronics for Instrumentation, Automtic Feedback Control, Design of Pressure Vessels, and Operations Research and Systems Analysis.

After serving in the Navy as an electronics equipment installation technician and graduating from Caltech, Noon was employed for 18 months by Technicolor Motion Picture Corporation, Hollywood, where he performed manufacturing operations trouble-shooting and process engineering. He left Technicolor in 1950 to join Cutter Laboratories, Berkeley.

Noon's experience at Cutter included the following: one year in construction of a large compression distillation unit, from design stage through reproducible operation; two years in chemical engineering, in which his responsibilities covered supervision of engineers and draftsmen involved in many varied instrumentation and plant construction projects; one year as assistant to the Vice President-Manufacturing, during which he was responsible for design and construction of an Argentine manufacturing facility; and two years as Plant Engineer, during which his duties involved construction and alteration contracts for the Berkeley plant, long range budgetary and facilities planning, improvement of instrumentation and maintenance programs.

In 1957 Noon joined Dow Chemical Company, Pittsburg, California. There he spent two and one-half years as Senior Project Engineer, his work including all phases of projects varying from instrumentation to plant construction. Examples are: design of raw materials handling methods; evaluation of means of disposing of chemical wastes; design and construction of an ion exchange recovery unit; process design for pumping liquid explosives through a populated operation area; evaluation of engineering design at four Los Angeles plants; and responsibility for Operations Research study into optimum inventory policy for a continuous processing plant.

In October, 1959, Noon accepted an offer from Arnold T. Challman, Magnetic Tape Division Marketing Manager, Ampex Corporation, to be Chief Application Engineer of the Division. His responsibilities covered: technical liaison with tape users and customer engineers; technical liaison between tape manufacturing and quality control groups and research and tape recorder equipment manufacturing; participation on the product planning committee for new tape products; and management of an engineering properties testing facility for evaluating proprietary and competitive tape products.

In April, 1960, Ampex relocated its Magnetic Tape Division personnel to Opelika, Alabama, where its tape manufacturing facility is situated. Noon declined to be transferred to Alabama, and accepted appointment as Staff Engineer in the Corporate Research Division of Ampex. In this capacity, Noon worked directly under Donald Eldridge. Noon worked on several research projects concerning the fundamental nature of magnetism in both continuous thin films and discrete fine particle films. However, his most notable contribution in his eight months tenure in Corporate Research was the design and construction of a pilot operation producing plated metal-backed magnetic tape.

Noon is a Registered Professional Chemical Engineer and a member of several professional societies including American Institute of Chemical Engineers, Instrument Society of America, and the American Chemical Society.

Arnold T. Challman (responsibility: marketing)

Challman is 41 years old, married, three children. Graduated with degree of Bachelor of Science in Mechanical Engineering from University of Washington. Military service with United States Navy during World War II with rank of Lieutenant Commander and responsibility of Executive Officer on a destroyer in the Pacific Theatre. Following discharge, Challman was employed for 11 years by Minneapolis-Honeywell in various selling capacities. These included: four years as sales engineer selling instruments to all types of industry; five years as a branch sales manager, supervising approximately 50 employees in three district offices; and two years as assistant to the Midwestern regional sales manager, where duties involved recruiting, salary administration, office management, sales planning to attain volume goals in excess of $30 million, and budgeting and financial control for all regional marketing activities.

In 1956, Challman left Minneapolis-Honeywell for Ampex Corporation. His initial responsibility was Instrumentation Division Co-ordinator, a staff position reporting directly to the Division Manager. Specific duties assigned to him included the integration of

activities of design engineering groups and production engineering groups to assure the smooth flow of new products from final testing in the labs to initial production.

From 1957 to 1960, Challman was responsible for all Ampex marketing of precision magnetic tape products. This responsibility began when Ampex obtained a contract to market all precision tape manufactured by Orr Industries, Opelika, Alabama, then an independent company and now merged into and a division of Ampex Corporation. Challman had the task of building a marketing organization starting with himself and a secretary. In less than three years, an organization of 24 employees, consisting of advertising, order handling and market research departments and a national direct-sales force, was marketing tape at an annual rate of several millions of dollars.

When Ampex top management determined, in April 1960, to consolidate all Magnetic Tape Division activities in Opelika, Challman elected not to relocate. Concurrently, Ampex was in process of establishing Ampex Military Products Company, a subsidiary whose marketing activities primarily involved sales of research type contracts to government procurement agencies and prime military contractors. Challman accepted the position of Marketing Manager, where the responsibility encompassed preparation of contract bids and proposals, application engineering, sales, and detailed administration of contracts. It also included technical liaison between the Military Products Company and the Corporate Research Division. As in his experience in the Magnetic Tape Division, Challman's task again involved the planning and staffing of a new organization to carry out this marketing activity.

Challman is a member of the Instrument Society of America, American Society of Mechanical Engineers, American Ordnance Association, American Management Association and a Registered Professional Engineer.

Laurence L. Spitters (responsibility: finance)

Spitters is 34 years old, married, five children. Graduated with degrees of Bachelor of Arts from Western Michigan University, Master of Business Administration from Harvard Business School, and Doctor of Law from University of Michigan Law School. Military service primarily involved duty as an agent of Counter Intelligence Corps (CIC) in United States and European Theatre.

Spitters' legal experience was limited to a brief employment in the general counsel's office of the John Hancock Life Insurance Company, Boston. His business experience prior to employment by Ampex Corporation was in the investment banking industry. He joined Blyth & Co., Inc. in 1954, and worked on Wall Street for one year before being transferred to Blyth's San Francisco office. In the latter employment, he was a member of the underwriting and investment banking department, in which he was engaged in a variety of activities including the origination, underwriting and syndication of issues of corporate securities for public distribution, private placement of corporate securities with institutional investors, and evaluation of companies involved in merger and acquisition transactions.

In 1957 Spitters was transferred to the Portland office of Blyth. His responsibility was that of representative of the underwriting and investment banking department in the Pacific Northwest, including Portland, Seattle and Spokane. In 1958, desirous of returning to Northern California, Spitters resigned from Blyth & Co., Inc., and joined Ampex Corporation, in whose financing he had assisted while previously employed in San Francisco.

Spitters' initial position at Ampex was assistant to the Vice President and Treasurer. His duties involved assignments relating to Ampex's listings of its shares on the stock exchanges, the offering of shares to stockholders in March 1959, and the study leading to the merger with Orr Industries, Ampex's magnetic tape manufacturing affiliate, in October 1959. Other duties involved special assignments in areas of financial management and control.

In July 1960, Spitters was made Assistant Treasurer of Ampex. His duties were essentially unchanged, but his organizational responsibility was changed and he reported directly to the President. In this position, his major responsibility was the study leading to the merger with Telemater Magnetics, Inc., Los Angeles manufacturer of magnetic cores, buffers and memories for data processing and computer systems. Other assignments related to recruitment of top-management personnel, studies of accounting and taxation problems, analysis of companies under consideration for merger or acquisition, and financial staff work.

Spitters is admitted to the practice of law in the State of Michigan. He is a member of the Business Law Section of the American Bar Association, the American Management Association, and the National Association of Accountants.

At the time of their employment by Ampex, each of the four founders was required to sign an agreement then used by Ampex for all employees. A provision of this agreement purported to require assignment of inventions or improvements within the existing or contemplated scope of Ampex's business made or reduced to practice during a period of one year following effective termination of employment. In the opinion of counsel for the Company, this post-employment restriction is not enforceable under California law.

The four founders intend to enter into employment contracts with Memorex which will provide for their employment by Memorex for a period of 4 years at a reasonable rate of compensation to be fixed from time to time by the nonfounder members of the Board of Directors.

The founders intend to fill key supervisory and technical staff positions as needed. A number of qualified men have informally applied for employment by the Company and are under consideration. It is anticipated that stock options and other key personnel stock incentive plans may be utilized when deemed to be necessary and desirable by the Board of Directors to attract and motivate creative and productive employees. However, no specific plans have been formulated to this end at the present time.

(2) Board of Directors

The Board of Directors of Memorex Corporation will consist of nine members, four of whom will be the founders. It is also hoped that the five nonmanagement members will

include an official of a San Francisco bank, an executive of a local electronics manufacturing company, a scientist, and two executives from industry or the financial community who possess extensive experience as directors of other companies.

B. Capital Requirements.

The manufacture of tape is a process industry. It is analogous to other process industries, e.g., petroleum refining and chemical distillation, in that sizeable production capacity is inherent in the optimum design of a tape plant. Hence, a tape plant of a new company will be capable of manufacturing a volume of products substantially in excess of its initial marketing capacity. A rapid build-up of sales is necessary to enable the utilization of this production capacity, so that operations will provide a satisfactory return upon investment. Accordingly, a new company must make a large capital investment in plant and possess a large working capital to accommodate an immediately sizeable sales volume.

The founders of Memorex Corporation have determined that $1,262,500 will be required to finance its entry into the magnetic tape industry. Of this amount, $1,250,000 will be derived from the private placement of securities among a selected group of investors, and the founders will invest $12,500. Use of proceeds from the sales of securities has been budgeted as follows:

Investment in capital assets (discussed below)	$561,500
Preproduction expenses incurred in connection with pilot plant operation, marketing and research and development activities prior to production, and legal and general administrative expenses	$130,000
Working capital required at the beginning of production for sale	$571,000
Total proceeds from financing	$1,262,500

(1) Investment in Capital Assets

Set forth below is a summary of the Company's proposed investment in capital assets. The estimates were prepared in the first instance by the founders. Mr. W. G. Clark, a professional estimator with extensive experience in preparing new plant estimates for major chemical companies, was also retained to prepare estimates independently. Where Mr. Clark's estimates exceeded those of the founders, Mr. Clark's figures were used in place of and incorporated into management's. The initial investment in capital assets should enable the Company to produce at an annual sales volume approximating $4.5 million. An incremental $225,000 investment should enable the Company to produce at approximately double that volume, or $9 million.

Purpose for which Budgeted	Estimated Cost of Equipment	Estimated Cost of Installation	Total
Leasehold improvements to building	$ —	$76,750	$76,750
General purpose equipment (air compressors, vacuum system, electrical distribution system, etc.)	24,000	6,650	30,650
Sterile air supply system	28,450	24,880	53,330
Dispersion mixing system	41,540	16,640	58,180
Mylar handling equipment	15,930	3,430	19,360
Coating, drying, and calendering equip.	56,640	8,460	65,100
Slitting, rewind and finishing equip.	30,110	3,730	33,840
Office equipment, tools, research and test equipment	62,000	1,240	63,240
Furniture, laboratory benches, etc.	8,060	—	8,060
	$266,730	$141,780	$408,510
Add: 9% Freight and taxes			24,260
15% Contingency fund (on equipment)			46,700
Contract engineering			10,000
Direct investment in capital assets			$489,470
Add: Check-out and start-up expenses prior to production			72,000
Total investment in capital assets			$561,470

(2) Manufacturing Facilities

Management intends to lease the Company's building. Operations will require approximately 15,000 square feet for laboratory work and manufacturing. While the configuration of the coating and drying line demands a long and narrow area, other operations (slitting, testing, packaging, etc.) can be so situated with respect to the line that many standard tilt-wall buildings will accommodate all operations.

Substantial leasehold improvements will be required. These include smooth plastered walls (to prevent dust clinging and cumulations), compartmented areas (to permit efficient air conditioning), air-lock pass-throughs from white rooms to non-processing areas (to prevent contamination of the white room environment), extensive sprinkler system (to protect against the hazard of solvents), and electrical power conduit (to operate line machinery, equipment, and ovens.)

Most of the equipment will be custom-made or significantly re-engineered standard equipment. Most of the instrumentation will be standard, although a few of the most important quality control devices will be specially developed by the technical members of management. (The latter work has been underway for several weeks.) Test equipment and tape recorders for testing are readily available standard products.

The building will be located on a several acre site in an area zoned for heavy industry. This necessity arises because evaporated solvents will be released from the plant. Although the fumes are colorless and in low concentration because of the large volume of circulating air utilized, a public nuisance might be construed if other than a heavy industry zone were selected. The sizeable plot is required because a solvent storage area, diked against explosion hazard, must be maintained at a sufficient distance from the plant in order to obtain a favorable insurance rating.

Process engineering will be completed and the plant design fixed in March and April. Orders will be placed for equipment and construction contracts will be let immediately thereafter. Leasehold improvements should be substantially completed at July 1. Equipment receipts will extend from May 1 to July 1, and installation will proceed concurrently. It is expected that equipment installation will be completed by August 1, and that line components will be checked out and trial runs made to October 1. Shakedown operations will take place in October, November, and December, with inventory buildup and hiring and training of production crews in the last month. Production for sale is scheduled to begin January 1, 1962.

It should be noted that no independent professional process engineering expense will be required. This work, as well as a significant amount of instrumentation installation, will be performed by the Company's technical management.

The major emphasis placed upon quality control in the manufacturing process is suggested by proposed expenditures for quality control instrumentation, test equipment, and special control of process area environment. These expenditures, which are scattered throughout the several equipment categories above, total approximately $175,000, or more than 50% of the installed plant costs exclusive of leasehold improvements.

In addition to the direct investment in capital assets, it is estimated that approximately $72,000 expense will be incurred in the check-out and start-up period from August 1 to January 1, 1962. It is the intention of management to capitalize these expenses, which are plant related and which are prior to the beginning of production for sale.

In summary, the total investment in production capacity, including both capital assets and preproduction start-up expenses, will approximate $560,000.

C. Method of Financing Capital Requirements.

In order to finance the capital requirements set forth above, it is proposed that Memorex Corporation will be organized as a California corporation with the following capitalization:

	Initial Capitalization	Assuming Conversion of 6% Conv. Sub. Prom. Notes
6% Convertible Subordinated Promissory Notes due 1971	$600,000	none
Common Stock (par value $1 per share): Class A (to be issued to investors) 6,500 shares outstanding initially, 12,500 shares outstanding upon conversion of 6% Convertible Subordinated Promissory Notes	6,500	$ 12,500
Class B (being issued to founders) 12,500 shares to be outstanding initially	12,500	12,500
Paid-In Surplus	643,500	1,237,500
Total Capitalization	$1,262,500	$1,262,500

Securities to be placed with investors will consist of 100 units of Convertible Subordinated Promissory Notes and Class A Common Stock, as follows:

Per Single Unit	Per Total of 100 Units
$6,000 6% Convertible Subordinated Promissory Note due 1971 (convertible into 60 shares of Class A Common Stock)	$6,000 6% Convertible Subordinated Promissory Notes due 1971 (convertible into 6,000 shares of Class A Common Stock)
65 shares of Class A Common Stock (par value $1 per share)	6,500 shares of Class A Common Stock (par value $1 per share)
Price per unit: $12,500	Aggregate price $1,250,000

Each unit when purchased will provide its investor with $6,000 Convertible Subordinated Promissory Note and 65 shares of Class A Common Stock. Assuming conversion of the Note, each unit would provide its investor with 125 shares of Class A Common Stock.

Securities being sold to the four founders consist of 12,500 shares of Class B Stock (par value $1 per share). These securities are being sold to the founders at par value for cash and/or in satisfaction of out-of-pocket disbursements on behalf of the corporation prior to its organization, at an aggregate purchase price of $12,500, and each founder is purchasing an equal amount.

When initially capitalized, Memorex Corporation will have outstanding $600,000 Convertible Subordinated Promissory Notes and 6,500 shares of Class A Common Stock (which will be owned by the investors) and 12,500 shares of Class B Common Stock (owned by the founders). Assuming conversion of the Notes, Memorex Corporation

would have outstanding 25,000 shares of Common Stock, of which investors would own 12,500 shares of Class A and founders 12,500 shares of Class B.

The 6% Convertible Subordinated Promissory Notes (the "Notes") will mature April 1, 1971, unless redeemed or converted prior thereto. The Notes will be redeemable at the option of the Company, on at least 30 days notice, in whole or in part, at the principal amount plus accrued and unpaid interest. The Notes will be convertible at the option of the holder at any time from and after April 1, 1965, and prior to maturity, or, if the Notes are called for prior redemption, at any time prior to the close of business on the fifth day preceding the date fixed for redemption. The Notes will be convertible into Class A Common Stock at the rate of 60 shares for each $6,000 principal amount of Notes. The Notes will be subordinated to all bank loans. The Notes will accrue interest from November 1, 1961, and interest will be payable semi-annually on the first days of April and November.

The Indenture under which the Notes will be issued will provide that without the prior written consent of holders of not less than 65% of the principal amount of the Notes then outstanding, Memorex may not pay dividends on its Common Stock, purchase its Common Stock or issue additional shares thereof. Additional negative covenants restricting the activities of Memorex without a similar consent of holders of the Notes, which will be included in the Indenture, have not be finalized at this time.

Both the Class A and Class B Common Stock will have full voting rights, one vote for each share held of record, and holders will be entitled to cumulate their votes for the election of directors. Stockholders will share pro rata in any distribution in liquidation of the Company, except that holders of Class A stock will be entitled to recover the full amount of the purchase price for their shares prior to any participation by the holders of Class B stock, at which point the holders of Class B stock will be entitled to recover $1 per share, and thereafter all holders of Common Stock will participate equally in distribution. Stockholders will be entitled to such dividends (noncumulative) as may be declared from time to time out of funds legally available therefor.

The Commissioner of Corporations of the State of California will require the escrow of all of the securities to be issued by Memorex Corporation, and such securities will be deposited with the Commissioner of Corporations as escrow holder. While in escrow, such securities may be transferred with the consent of the Commissioner. On the basis of past practice, release of such securities from escrow by the Commissioner of Corporations will be contingent on the firm establishment of Memorex as a going business concern and the achievement of a satisfactory earnings record over a period of at least three years.

No underwriter, broker, or agent will be employed to effect the sale of any of the units to be placed directly by Memorex Corporation. No sales commissions will be paid and no sales concessions will be granted, and 100% of the price of securities to be sold will be paid into the Company.

Sale of the units consisting of Notes and Class A Common Stock to be offered to investors will be made only to those who possess a bona fide intent to acquire such securities for investment, so as to qualify for a private offering exemption under Section

4(1) of the Securities Act of 1933. Accordingly, it will be necessary for all investors to give written assurance of the fact that they are purchasing these units for investment only. In addition, in order to protect both the Company and its investors, transfer of the Notes, the Class A Common Stock or the Class A Common Stock into which the Notes are convertible will not be permitted unless the proposed transferor obtains either

(1) An opinion of counsel for the Company to the effect that the proposed transfer will not result in a violation of the Securities Act of 1933; or

(2) A letter from the Securities and Exchange Commission that the Commission will take no action with respect to the proposed transfer; or unless a Registration Statement covering the units be in effect at the time of the proposed transfer. In this connection, the Company, prior to the date on which the Notes become convertible, will cause the Notes (and the underlying Class A Common Stock into which they are convertible) and the Class A Common Stock sold to investors to be registered under the Securities Act of 1933.

D. Management's Estimated Financial Goals.

The following projected financial goals are those which the founders have set for themselves and which they deem to be realistic. There is, of course, no assurance that such goals will be reached. A comprehensive plan of operations has been projected for the preproduction activities of the Company and the first 48 months of production, the financial summary of which is shown on the following pages.

The plan is based upon management's assessment of its technical capabilities and those of other key people who will be introduced into the Company, existing and developing marketing opportunities, and financial feasibility. The plan consists of several subsidiary programs, including the following:

- Manufacturing process engineering and plant design.
- Pilot plant construction and operation.
- Preproduction plant start-up operations.
- Research and development operations prior to start-up.
- New product development program.
- Marketing program.
- Organization and functions of the Manufacturing, Engineering and Quality Control Division, Research and Quality Assurance Division, Marketing Division, and Administrative Division.
- Preproduction nonplant related activities, including staffing of various functions.

Some work in every program in the plan has been accomplished. Particular effort has been placed upon process engineering and plant design, which are substantially completed, and upon pilot plant construction, which is well underway.

It is intended that the detailed plan will serve as the control device by which the performance of management will be measured by the Board of Directors.

The goals sought to be reached are as follows:

(1) For the first 36 months of production, output will be sales limited, i.e., manufacturing capacity will exceed marketing capacity.

(2) An accelerated buildup of sales volume is projected. In the first year of production, sales are projected for about $900,000 in the second year, $2.5 million, in the third year $3.8 million, and in the fourth year $4.5 million.

(3) Sales are projected to exceed cash disbursements beginning in the tenth month of production.

(4) Assuming a five year write-off of plant investment and start-up expense, break-even operations are also projected to be attained in the tenth month of production.

(5) Working capital has been budgeted so that, notwithstanding initial cash losses and an accelerated buildup of sales, working capital turnover exceeds 4.0 times only slightly and for a few months.

(6) Gross profit on sales (after all space costs as well as factory overhead) is projected to reach 50% or better after the ninth month of production.

(7) Research Division expenses are continuously budgeted at 10% of sales.

(8) Net income after taxes projected for the fourth year of production, which assumes a level sales pattern, a maintenance of the present industry price structure and a 52% corporate tax rate, is projected at 9.7% of sales.

(9) Net working capital is projected to approximate the amount of the initial capital investment, $1,262,500, at about the 30th month of production.

(10) Cumulative cash flow after taxes, assuming technological obsolescense of plant at the end of seven years and no residual value, is projected to provide a return on the initial capital investment of about 25% compounded annually; assuming ten years, the return projected is 30%.

(11) At the end of 48 months of production, if all projections are reached and excess working capital of approximately $800,000 would be generated which would be available for such corporate purposes as the Board of Directors deems appropriate.

III. APPENDIX: Process of Manufacturing Precision Magnetic Tape

Magnetic tape is produced by coating a plastic film with a dispersion or "paint" containing microscopic particles of iron oxide. There are no patents to the manufacturing process, which is described in detail in several texts and numerous technical journals. To simply coat a continuous film, that is to say, to make a low grade magnetic tape is not technically difficult and does not involve more than $200,000 of capital investment. To make precision tape requires substantial technical knowhow, derived from chemistry, physics, electronics, and process and control engineering. It also involves sophisticated process equipment, quality control instrumentation and test equipment, and a specialized facility, which require an investment of the magnitude of $500,000.

A schematic drawing of the manufacturing process typically employed in the industry and described in the technical literature is shown on the next page. The following outline explains the principal steps:

(a) Preparation of Base Material. Base material for most precision tape is Mylar film, sole source of which is duPont. The film is received in jumbo rolls 12" or more in width. Foreign matter, i.e. dust and bits of loose Mylar resulting from the slitting to jumbo size, is removed by a bath and scrubbing operation. The film is then dried and static electricity removed before it can be coated.

(b) Preparation of the Disperson or Coating Material. The most common method of preparing the dispersion is by milling the oxide and other ingredients of the coating formulation in a ball mill, a device used throughout the paint manufacturing industry. The oxide is purchased from paint raw material producers, primarily C. K. Williams Co., St. Louis. The other materials used in the formulation are wetting agents (to make easier the breaking up of oxide agglomerates), resins (to hold the oxide particles onto the Mylar), plasticizers (to assure a flexible coating), solvents (to be the fluid vehicle in which the other materials are coated and which is subsequently evaporated), lubricants (which minimize the abrasive quality of the coating), and stabilizers (which protect the finished product against physical deterioration due to moisture, fungus, etc.). These materials are readily available from major chemical producers. The oxide and other materials must be milled under controlled conditions and repeatedly tested before the dispersion is piped to the coating machine.

(c) Coating. The process of applying the dispersion to the Mylar base material can be effected by any of several coating and printing techniques. Most commonly used is the knife-coater. This technique utilizes a bottomless box, the sides of which rest on the Mylar film. The front plate of the box, or the knife, is raised slightly so that a long, narrow gap extends along the width of the tape. The dispersion is piped into the box, and gravity forces its flow under the knife and onto the film. Imperfections in the coating occur if agglomerates or foreign matter in the dispersion or on the film become lodged under the knife. This causes streaks where no coating is applied to the base. Temperature and viscosity of the dispersion, speed of the moving Mylar film, and other conditions of the coating process must be very closely controlled.

(d) Particle Alignment and Drying. When the wet-coated film or "web" moves from the coating machine, the needle-shaped oxide particles are oriented randomly, i.e., the particles point in all directions. To improve the quality of the tape, the particles must be aligned in a desired direction. The technique of alignment is to pass the web through a precisely controlled magnetic field, which is produced by specially designed instrumentation, while the coating begins to dry. The web passes out of the magnetic field when the alignment cannot be upset and enters the drying ovens. The drying ovens utilize huge volumes of electrically-heated, filtered air to evaporate the solvents in the coating. Again, extreme control is required of the temperature, humidity, and cleanliness of the air, the flow of air within the ovens, and the concentration of evaporated solvents, and each of these factors must be related to the speed of the process line and the length of time the web remains in the ovens.

(e) Calendering Operations. Experience has demonstrated that performance quality of tape is improved by super-calendering, a process similar to that employed in paper manufacturing. If the surface of a magnetic tape is smooth, its sensitivity is greater. To achieve this characteristic, the web, after passing through the drying ovens, is subjected to a calendering operation. In this process, the tape is brought into contact, under pressure, with highly polished steel rolls. Control in this operation involves keeping the rolls dead true along the width of the web and the immediate removal of loose particles. The web is then wound on jumbo rolls after the static electricity generated by the process operations has been removed. Extreme care is again necessary to assure that no dust particles or other matter is wound into the rolls.

(f) Slitting and Rewind Operations. The web must be slit to narrow widths and rewound upon rolls and then packaged for sale. The slitting operation is critical, because if the tape edge is not cut sharp or if the edge is crooked over long lengths, it is unsuitable for precision tape use. Unfortunately, slitting equipment commonly used in the paper and film industries for producing ribbons, adhesive tapes, etc., cannot meet the dimensional tolerances required in magnetic tape slitting. Hence, the standar shear-type of slitter which is purchased must be carefully re-engineered and reconstructed to enable it to slit magnetic tape. The slitting equipment must also be modified so that slit tape can immediately be rewound onto plastic or metal reels. The rewinding process again involves elimination of static electricity and careful control of the winding mechanism to avoid uneven tracking and too low or too high a degree of tension in the windings. The finished reels of tape are then tested, placed in sterile plastic bags, and boxed.

The entire tape manufacturing process is carried on in a "white" room environment, similar to those used in the manufacture of sterile pharmaceuticals. While mediocre quality tape can be manufactured without maintaining this environment, it is safe to say that it is quite impossible to manufacture the highest quality tape without it. Thus, the processing room is isolated; the intake air is filtered and kept at constant temperature and humidity; it is not recirculated. Materials and production personnel must pass through air-locks before entering the production area. All persons in the production area must remove street shoes and wear surgical caps and lint-free uniforms.

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As indicated in the preceding paragraphs, numerous quality control tests are performed in the manufacturing process to assure that each step of the process is accomplished satisfactorily. Final product testing, after the slitting operation, involves evaluation of physical and electrical characteristics of the product. Physical properties of tape are as important as electrical properties because a tape with premium electrical qualities is useless if it tracks poorly because of inaccurate slitting, or if layers stick together, or if it breaks easily. Hence, some dozen physical tests and another dozen electrical tests are made. Some of the tests are applied to every reel of product, others are applied on a random statistical basis. Most of the physical tests are carried out on standard or special test equipment; almost all of the electrical tests are carried out by running the tape on a tape recorder.