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THE MASSACHUSETTS TECHNOLOGY EXCHANGE PROGRAM

FINAL REPORT

FOR THE FISCAL YEAR ENDING JUNE 30, 1976



MASSACHUSETTS SCIENCE AND TECHNOLOGY FOUNDATION

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EXCHANGE PROGRAM

FINAL REPORT

FOR THE FISCAL YEAR ENDED JUNE 30, 1976

Submitted By:

The Massachusetts Science
and Technology Foundation

Dr. J. P. Silvers, Director

Submitted To:

The U. S. Department of Commerce
Economic Development Administration

Technical Assistance Program
Project No. 99-6-09438

This technical assistance study was accomplished by professional consultants under contract with the Economic Development Administration. The statements, findings, conclusions, recommendations, and other data in this report are solely those of the contractor and do not necessarily reflect the views of the Economic Development Administration.

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"Draft" Final Report to the EDA
For the 12-month Period Ending
June 30, 1976

This "Draft" Final Report is submitted in accordance with terms and conditions associated with the grant received under the EDA Technical Assistance Program, Project #99-6-09438.

Results achieved during the 12-month grant period compare favorably with forecasted performance. Nearly 100 small businesses and entrepreneurs obtained in-depth assistance thru MTE, resulting in 10 new business formations, 151 new jobs created or saved, and 780 instances of satisfied client "needs".

The above near-term accomplishments belie the longer-term contribution to economic growth in Massachusetts. A sampling of eleven firms receiving MTE assistance during the grant period presently have aggregate annual sales of \$4.6 million and employment of 120. However, within 3-5 years, these same eleven firms expect to experience aggregate revenues of \$90 million and provide employment for 1700 citizens. Without MTE assistance, the economic contribution from these firms would have been significantly delayed or lost forever.

In addition to the routine activities of MTE, several new initiatives were undertaken in response to general problems identified in the operating environment of small business. Notable in this area is the building of support for the Massachusetts Technology Development Corporation (MTDC) -- a proposal before the state legislature to provide incentives for private investment in developing businesses. Such vital risk capital is presently all-but-unavailable from traditional sources.

MTE has applied the energy and expertise of graduate business school students and faculty to the revenue generation problems of small firms. Fifteen such student studies were completed this year and provided needed market research, new product, corporate strategy, and financial studies at very low cost to participating firms.

MTE got involved with the Commonwealth's economic development initiatives for disadvantaged, older cities and towns. For example, MTE assisted the City of Lynn, hard hit by the exodus of local shoe manufacturing, to establish a Municipal Development Corporation (MDC). Lynn's MDC would provide capital incentives to businesses wishing to relocate or expand within the city. Additionally, MTE helped organize and run one of a series of "Survival '76" procurement seminars for local businesses and is participating in the formation of a Footwear Research Institute that would investigate and fund innovative approaches to shoe manufacturing.

State Government's growing recognition of the economic importance of high-technology businesses has caused greater usage of MTE's expertise by state agencies. MTE participates in the legislative task force created to design new state-sponsored capital incentives for business. Also, MTE has become a formal part of the Commerce Department's business assistance program. Finally, MTE regularly contributes to such vital state agencies as the Office of State Planning and the Legislative Science Resources Network.

In sum, MTE has made significant progress in understanding the highly complex process of economic development. MTE participates in all three phases, viz.:

Business Formation
 Business Development
 Industrial Expansion.

Historically, MTE's expertise has been in the former two categories. The past twelve months have strengthened and broadened this expertise, and MTE's participation is now being sought by public and private institutions concerned with all three phases of economic development.

Anticipated Growth in Clients' Economic Contribution

Any statistics that summarize the revenues or employment created within a specified time period do not tell the entire story of the economic impact achieved through use of MTE services. Indeed, small, high-technology firms rarely remain stagnant in terms of corporate growth. That such growth is facilitated is the very nature of MTE's services, and the ultimate impact of MTE assistance cannot be fully adduced until some later date in the corporate experience.

MTE does not claim to be the singular cause of future success for all clients serviced. However, MTE, in many instances, provides assistance at the time such help is critical to the firm's short-term survival. When so regarded, MTE's services play an important part in assuring that the longer-term economic benefits of corporate growth obtain.

As an example of the magnitude of these future benefits and to indicate the incomplete picture derived from a near-term outlook, the following table details the aggregate experience of and outlook for the eleven firms included in the previous "Selected Case Studies" section.

Actual Results and Forecasted Performance for Eleven Selected MTE Clients

	Actual, as of June, 1976	Firm's own Forecasted Results Within Next 5 Years	Percentage Increase
Total Employment*	120	1697	1310%
Total Annualized Sales	\$4,600,000	\$89,900,000	1850%

*includes only employees of client firms; does not include indirect employment created of subcontractors, etc.

Introduction

In accordance with the general terms and conditions of Project #99-6-09438 under the EDA Technical Assistance Program, the Massachusetts Science and Technology Foundation (MSTF) submitted a "Workplan" in July, 1975 that specified the performance to be accomplished by the Massachusetts Technology Exchange (MTE) during the first six months of this grant. That document also provided definitions for the types of measurable activities involved in assessing the economic impact under this grant. Subsequent Quarterly Progress Reports extended the workplan to cover the program for the entire year and concurrently made appropriate modifications to anticipated program results by means of a rolling forecast of specific accomplishments.

This "Draft Final Report" details the accomplishments of MTE for the twelve months (July 1975-June 1976) of operation funded under the EDA Technical Assistance Program. The format and definitions for economic impact are precisely consistent with those cited in the original "Workplan" and as used in the First, Second, and Third Progress Reports.

As envisioned in a dynamic program such as this, new opportunities arose during the year for MTE involvement in projects outside the day-to-day scope of activities as specified in the original "Workplan". The resulting initiatives were motivated by problems (both expected and unanticipated) which were encountered and which appeared to be more consistent with the intent of the grant. Accordingly, both the problems encountered and the ensuing initiatives are summarized herein.

Following review, evaluation and comments by the Grant Administrator for the Economic Development Administration, all comments will be incorporated into the Final Report in accordance with the Reports Section of the Contract General Terms and Conditions.

Statistical Results for the Period July 1, 1975 - June 30, 1976

The following summarized statistical information presents the actual results for both the fourth quarter and for the twelve month period of the MTE activity funded, in part, under the EDA Technical Assistance Program. The rolling twelve month forecast results are also presented in order to provide some guide to assessing the effectiveness of MTE.

The "economic impact measures" which are cited below were fully defined in the original "Workplan", submitted on July 17, 1975, and need not be duplicated in this report.

Economic Impact Measures

I. <u>Initiatives</u>	<u>Actual</u>	July - June <u>1975-76</u>	<u>Forecast</u>
	Apr.-June <u>1976</u>		July - June <u>1976 - 1977</u>
Field Trips	106	656	694
Client Interviews	106	655	685
New Client Listings	28	99	91
Client Needs Fulfilled-*Total	<u>195</u>	<u>780</u>	<u>751</u>
-Technology Transfer	1	2	3
-Business Assistance	65	242	220
-Personnel Transfer	2	7	7
-General Info Transfer	95	454	472
-Financial Advice/Referral	31	75	49
II. <u>Results</u>			
Jobs Created/Saved	22	151	166
New Product Develop. Projects	2	16	22
New Business Formations	3	10	10

*Includes Resources Transferred to both existing and new client companies.

Comments on the Above Results

Early in the program year, it became apparent that the dynamic mode of MTE operations and the "unprogrammability" of the new business formation process made it difficult to accurately forecast the occurrence, within any specified time period, of the "economic impact measures" presented above. Accordingly, forecast "Initiatives" have been revised during the

grant year to reflect awareness of this dynamic situation and to provide a continuing realistic statistical basis for an analysis of those activities which have culminated in maximum benefits in the all-important area of economic results, particularly in the category of "Jobs Created/Saved".

The actual results for the year compare quite favorably with the original program forecast in the general category of the economic results anticipated under the grant. These results also clearly indicate the level of effort which will be required by MTE in a subsequent program if it is to continue to attain similar objectives. Naturally, only finite end-results can be indicated for any specified calendar period and there is no way to quantify those on-going initiatives which offer much potential for future positive economic results. The actual case studies presented in a latter section of this report document positive quantitative results attained on certain completed initiatives as well as provide an explanation of how the initiatives evolved.

The MTE staff fell short of its target in several of the initiative categories because of an unexpectedly high volume of inquiries for assistance from industry and also due to a loss of some permanent staff members. To counteract this development, emphasis was placed on improving the efficiency of client contacts and need-fulfillment actions and also on establishing priorities for those situations which offered greatest promise of more imminent economic pay-off. The development of an extensive referral system and client qualification criteria which permitted a more selective case load led to increased internal efficiency despite staffing limitations. Field trips/client interviews have proved to be the backbone of MTE's operations during the year and we believe there is a strong correlation between the large number of these initiatives and the favorable results in the Jobs Created/Saved category.

Selected Case Studies

The following case descriptions exemplify the range of assistance available through MTE and the client-specific nature of the activity. These are not hypothetical situations. These are actual case histories whose economic impact is reflected in the afore-mentioned results.

TCS Corporation was formed in late 1973 to capitalize upon market opportunities in the telephone "peripheral" equipment business (e.g., answering machines, automatic dialers, WATS extenders, call diverters, etc.). The two founders, between them, had 25 years' experience in designing, manufacturing, and marketing telecommunications products. They recognized that a significant opportunity existed for a device that would automatically divert incoming telephone calls to any other phone of the receivers' choice. While competitive devices were available that allegedly performed such a function, their acceptance had been severely limited due to poor product quality, difficulty of operation, lack of serviceability, and high initial price. TCS Corporation set about to design and market a product that addressed the shortcomings of competitive machines.

Even with the founders' extensive experience, the product design task turned out to be much more complex than originally envisioned. The founders' personal financial resources were only enough to fund the construction of a working prototype that had been tested on a limited geographic scale. The prototype's performance was sufficiently impressive to convince a local bank to extend a line of credit to TCS, secured by inventories and receivables during commercial start-up. Just as TCS began to achieve market penetration, severe product performance problems began to surface that were the result of unpredicted variations in telephone-company equipment output.

The results for TCS were disastrous. Most units were sent back to the factory for "repair". Product revenues ceased while TCS' principals feverishly worked to redesign the product so as to accommodate the unforeseen telephone equipment variations. Bank loan repayments soon ceased, and in June of 1975, the bank called the loan and forced TCS into receivership. Five production and two professional workers were in jeopardy of losing their jobs.

MTE learned of the situation in early June. Literally, through MTE's friendly persuasion and the willingness of the bank officer to "go the extra mile", liquidation of TCS was deferred until more information could be obtained to judge the viability of TCS' product concept. However, the bank was reluctant to commit additional funds to the situation. In response, MTE consented to perform some preliminary market research to assess the volume potential for a properly designed telephone call diverter. The bank would not be charged for the service.

Working with the bank, TCS' principals, and published reference sources, MTE compiled an independent (and quite positive) market report

on the outlook for telephone call diverters. The report was presented to management in early September. As a result of the report's positive findings, the bank decided to fund additional product development by TCS with the intent of producing a workable design that will be attractive to outside investors. Unfortunately, while subsequent product development produced such a workable prototype, investors determined that competitive risks were too high to warrant market introduction and the firm's technology was sold to a competing manufacturer.

Theta-J Corporation. In August, 1974, MTE was approached by an un-employed engineer who, in his spare time, had developed a solid state relay (current switching device) that allegedly offered significant improvements over presently-available designs in terms of voltage-handling capacity and low-cost performance.

MTE referred the engineer to an entrepreneur with extensive start-up experience in electronic components. The two gentlemen formed a partnership and began to seek start-up financing. Again on the strength of MTE recommendations, the partnership was able to establish banking relationships with one of the region's largest institutions. Bank credit was contingent upon additional equity infusions into Theta-J. MTE subsequently contacted a number of potential investors and a successful private equity placement totalling \$130K was consummated that allowed volume production to begin.

Originally, production facilities were to be located in New Hampshire. However, through MTE's friendly persuasion and its responsiveness to Theta-J's needs, the principals eventually decided to locate corporate headquarters in REading, Massachusetts, and manufacturing in Andover, Massachusetts. (Both areas of abnormally high unemployment.)

Initial product acceptance indicated that potential demand was enormous and possibly outside the new company's limited resources. Theta-J sought MTE assistance in locating a larger manufacturer to which a portion of the manufacturing burden could be subcontracted. MTE contacted the invention development subsidiary of a large, multi-national conglomerate. As a result, a subcontracting/licensing agreement is being negotiated between the two firms.

Theta-J began full-scale market introduction in late June 1975. Early indications are that potential demand runs well in excess of \$2 million/year. Theta-J presently employs twelve full-time people. Revenues are presently at the \$400,000 annual level with the employment of 25 full-time individuals forecasted within one year.

American Pacemaker Corporation (Bedford, Mass.) In the spring of 1975, MTE was apprised that American Optical Co. (a division of Warner-Lambert Corp.) was going to divest itself of the pacemaker product line,

manufactured in Bedford, Mass. Two firms, one in New Jersey and one in California, had expressed interest in purchasing the business and moving it out of state, with the prospective loss of 53 jobs in Massachusetts.

Three individuals, employed at the time by Parke-Davis, Medical Instruments Division (Waltham, Mass.) came to MTE upon learning of the American Optical decision to divest. These individuals were in top management positions at the Parke-Davis division and possessed a type and level of experience wholly appropriate to the management of the A/O Pacemaker Division. These three exceptional individuals could produce a portion of A/O's asking price for the Pacemaker Division, but a large level of debt financing would be required to consummate a "deal". If such financing arrangements were successful, the Pacemaker Division would be retained in Massachusetts.

MTE assisted the three entrepreneurs in a proposal for \$350,000 in debt financing from the SBA -- a rather large proposal by any standards in the financial community and particularly large for the SBA. MTE guided the principals through the mechanics of the loan application and "nurtured" the application through the approval process.

In October 1975, as a result of MTE's support and expediting of the loan approval, the SBA granted the required financing and the three principals took over control of the division, renaming it the American Pacemaker Corp. (APC). Much publicity was obtained, both at the local and state level, for MTE's successful participation.

At the present time, APC has met or exceeded all revenue and profitability forecasts, has significantly expanded its national marketing force, and anticipates a doubling of revenues and employment by the end of 1976. APC has been so successful that a major New York based investment brokerage house has agreed to underwrite a public stock offering within the next 6 months (a highly unusual occurrence in today's depressed equity markets).

APC's principals maintain that MTE's assistance in the SBA loan approval was a major (and controlling) factor in the firm's continued operation within Massachusetts.

Lexidata, Inc. (Lexington, Mass.). MTE has been involved with this firm since its inception about two years ago. Lexidata developed and presently manufactures a highly ingenious and cost-effective video-generator system that is compatible with Data General's computer equipment. Through the use of a single assembly, in the form of a printed circuit board, Lexidata's devices translate "digitized", electrical-pulse information into signals appropriate for display on a video screen. The highly innovative approach employed by Lexidata significantly reduces the material and assembly costs to manufacturers incorporating video display capabilities in their equipment.

MTE's involvement with Lexidata has taken a number of forms. Upon completion of the product development activities, MTE helped the principals write a business plan directed at securing \$125,000 of capital for equipment and working capital necessitated by expanding manufacturing needs. An all-debt package subsequently was rejected by local banks on the basis of Lexidata's short history.

Not to be deterred, MTE brought in an equipment leasing firm that subsequently agreed to finance Lexidata's acquisition of \$70,000 in equipment purchases (all of Lexidata's requirements) on terms that were quite attractive to Lexidata. MTE then went back to the bank and successfully negotiated a loan for \$25,000 to Lexidata which met the majority of capital needs to begin full-scale production and marketing.

In the marketing area, MTE introduced Lexidata to an overseas licensign broker that specialized in the joint-venturing of computer-based technologies in the U.S. and Japan. As a result, both Mitsubishi Electric and Nippon Electric, major Japanese computer and electrical equipment manufacturers and U.S. licensees, are interested in licensing Lexidata's product line for inclusion in Japanese-made computers.

Most recently, MTE introduced Lexidata to a well-known venture capitalist in New York that invested in some of today's biggest mini-computer manufacturers. This individual has agreed to invest in excess of \$100,000 in Lexidata to finance continued expansion, contingent upon the receipt of certain business documentation from Lexidata.

The sum total of MTE's efforts on behalf of Lexidata has resulted in 10 new jobs, 4 of which were added within the past 3 months.

Ring Saws, Incorporated. MTE's involvement with Ring Saws began in 1970. The company was formed to manufacture a highly ingenious type of portable power saw under exclusive license from Italian inventors. The unique design permits the saw to compete functionally with most varieties of power saws (e.g., circular, bow, cut-off, and chain saws), but with significant additional advantages incorporated in a single design:

- larger depth of cut
- self-feeding and reduced operator effort
- no blade "kick back" or shattering
- versatility to cut all common media
- rapid blade change

MTE assisted Ring Saws in its formative period by providing numerous investor referrals that, in part, resulted in the successful capitalization of the firm.

Late in 1975, MTE learned that Ring Saws had encountered financial problems that threatened the firm's survival. A new management team had been installed that possessed vast experience in portable saw marketing -- an asset previously lacking within the organization. Ring Saws was

entering a refinancing program that would provide funds for product re-design (to satisfy the requirements of a huge commercial market), for desperately-needed working capital (to procure critical sub-assemblies), and to purchase the product patents from the displaced management team. Burdensome time constraints for refinancing were required by the patent holders.

MTE reacted quickly. Ring Saw's financial situation was studied in detail so that MTE could accurately represent the highly complex situation to the financial community. Indeed, Ring Saw's management could not afford the time required to identify and "qualify" all potential investors.

Over the course of two months, MTE contacted some twenty potential investors on behalf of Ring Saws. By the end of February, the firm had accomplished the major "milestone" in its refinancing program, resulting in unrestricted ownership of the product patents, a major roll-over of short-term debt, and substantial funds for inventory and payables financing. A crisis had narrowly been averted and Ring Saws was in an improved position to seek additional equity to finance continued growth. Eight jobs had been saved and the potential for future expansion was preserved.

Sound Industries, Inc. The product line which provides the revenue base for SSI was developed by Bolt, Beranek, Newman, Inc. in Cambridge, Mass. BBN is one of the largest and most reputable acoustical R&D firms in the world. BBN patented the "Husher" system, a sound masking technique, which has many applications in educational institutions, libraries and in "open landscape" offices in industry. BBN decided to license the technology and provide technical backup and referrals to SSI.

SSI encountered working capital problems in their effort to commercialize the technology. MTE assisted them in obtaining financing... more important, we were instrumental in enabling SSI to produce the patented "Husher" system with a minimum "front end" capital outlay. A joint venture was arranged with a local manufacturing concern which was operating below capacity. As a result of the arrangement, 10 people are gainfully employed to produce and market the "Husher" product line.

Mass/Energy Corporation. For the past 8 months, MTE has been working with a local inventor in establishing a company involved in the manufacture of energy saving devices.

The Mass/Energy Corporation has developed the first power management system specifically designed for cost saving energy control in industrial, commercial, institutional and governmental application. The equipment is constructed from state-of-the-art, off-the-shelf technology. The proprietary development provides low cost alternatives to the complex, highly-sophisticated computer-based systems.

The inventor, an MIT scientist, requested MTE's assistance in structuring a company to exploit the new development. After a careful evaluation of the technology, potential market, and available resources, MTE began developing an overall plan to develop a viable manufacturing operation.

Once MTE incorporated the company, three established marketing groups were introduced to the inventor with the possibility that a joint venture would facilitate the technology's advancement to the marketplace. Two of the groups, Boston Filter Company and Helio Solar are now actively engaged in acquiring rights to market Mass/Energy's "Energy Boss" in the retail, manufacturing, office building, and residential markets. Through an arrangement with the third marketing group, an introduction to Brandeis University was made. As a result, Brandeis and Mass/Energy have agreed upon terms for first installation of the "Energy Boss". In depth energy audits are now being conducted at the Brandeis campus for installation of the first test controller; follow-on installations at this local university is expected.

Through MTE's efforts in facilitating the development of the new business enterprise, the company has gone through a rapid start-up phase and should produce their first revenues within three months, upon completion of the initial Brandeis installation.

It is anticipated to hire at least three production employees and one individual to coordinate MEC marketing efforts within the next few months.

Diamond Machining Technology (DMT). Diamond, which offers both unique hardness and sharp edges of a crystalline structure, is an ideal cutter for machining many materials, provided that the diamond is suitably held as part of a tool. Industrial diamond is available as both a natural and a synthetic material in various mesh and other characteristics. In many applications the diamond is held in a metallic matrix formed by hot pressing of metallic powder and diamond blends with custom formulation to particular applications. The resulting diamond segments are then brazed to various blanks to form tools such as saw blades, etc.

Independently two separate parties have come to MTE for business assistance:

- a) The developer of a unique maraging steel wire upon which diamond segments could be mounted to make a new tool of major significance to the stone industry -- granite, the hardest stone, is now slabbed by a silicon carbide slurry and bare wire, with problems including brevity of wire life (SiC cuts both wire and stone), pollution to the extent of closing some operations, equipment maintenance (SiC cuts out bearings), product finish, and cost escalation (production of SiC is energy intensive and SiC is of greater value in steel production).

- b) A small group with expertise in diamond segment formulation and enterprise intent -- they planned to offer a high degree of service and custom work, consistent with their rare skills and smaller group size, to the stone, construction, optical and microelectronic industries.

MTE analyzed the needs of these two parties and found synergistic potentials in their combination. The combined product/market matrix is as follows (C=conventional, I-innovative, and F-future):

	<u>Granite</u>	<u>Soft Stone</u>	<u>Concrete</u>	<u>Glass</u>	<u>Wood</u>	<u>Micro-Electronics</u>
Diamond Wire	I	I		F		
Diamond Blade	C	C	C			
Dia. Gaging Heads	C	C				
Dia. Flexible Disk	I	I		I	I	
Dia. Button-lens grind				C/?		
Dia. Tab tool to place chip on substrate						I
Dia. Cutting Tool						F
Equipment	F			F		F

Currently the parties are putting together their resources and designing the firm to fit limited capital resources. The payoff for commercializing this technology is expected to be several hundred new jobs.

Telemetry Systems Engineering, Inc. (TSE). The Foundation began working with TSE in August 1975, at the request of Congressman Paul Tsongas. At that time, TSE was a "Design & Development" Company. Its President, Anthony J. Petrella, had spent 10 years with Allied Research Associates and with Avco Corporation as a distinguished aircraft and aerospace systems engineer. Operating out of a small basement office in an insurance company building in Andover, TSE had established a reputation for innovative systems engineering in telecommunications for the military and for aerospace industries.

TSE sought help from the Foundation in its effort to redirect its previous aerospace and defense-related engineering competence to the solution of industrial control and instrumentation problems. TSE's product concepts represent unique, reliable, and low-cost solutions to measurement, instrumentation and data transmission/interpretation in the vehicular testing, marine and utilities markets.

TSE is a classical example of an excellent growth potential situation being impeded severely by the absence of efficient equity placement mechanisms and the general unresponsiveness of risk capital. It took over 8 months to raise \$100K in a private placement offering and to obtain a \$200K SBA guaranteed loan through a local bank. As a result of the infusion of capital, TSE has moved to new quarters that are 5 times larger than its original offices and now employs 16 full-time and 3 part-time people. Two market studies have been done by students at the Graduate School of Business at Northeastern University and the School of Management at Boston College. The company is now booking new orders at the rate of \$100K/month. The company is on target with its projections and expects to have gross sales of \$20-30 million within the next five years.

Computer Genetics was started with the help of the Foundation by two engineers with extensive experience in the aerospace industry. The founders of CGC have expertise in physics, laser development, real time computer control and systems technology. The objective of the new company is to apply that expertise and technology in the pollution monitoring-control market.

The Federal Government defines heat as a pollutant. By 1978-1981, all water cooled power plants will be required to submit environmental impact statements showing cause why each plant should not build a \$20-40 million backtilted cooling tower. One application of the CGC technology is in the measurement of sub-surface temperatures. CGC has the capability to accurately measure the heated water discharge (thermal plume) created by power plants. Present techniques are extremely time consuming, questionable in accuracy and expensive.

CGC presently has 4 full-time and 2 part-time employees. The company is operating profitably. The total market for CGC services is estimated at \$75 million over the next 8 years. CGC's market share goal is \$5 million/year. Additional sales are expected from the sale of equipment and licensing arrangements.

Modatron, Inc. This company was started by a minority innovator entrepreneur with assistance from the Foundation over a 12 month period. The founder of the company developed the technology which is the basis for the new enterprise. The new company will manufacture and market a programmed microprocessor (PMP), a very powerful microcomputer system designed with two of the most powerful microprocessor chips available on the market.

With assistance from the Foundation and the Small Business Development Corporation in Boston, the minority entrepreneur has successfully assembled and tested his microcomputer. Students from the Graduate School of Business at Northeastern University completed an extensive project which details a market strategy for the new company. As a result of a Foundation referral, the company has raised \$200,000 to proceed with manufacturing and marketing of the new technology. Commercialization of the technology will create 20-50 primary jobs. The company expects to reach \$1 million in sales in the first year and ship an average of 1000 units/year.

Problems Encountered During MTE Operation

The implementation of MTE's objectives has not been without some problems that tend to inhibit effectiveness. The problem of growing client inquiries and the attendant necessity to perform more efficient screening were mentioned previously, and internal steps are underway to cope with the burden within the constraints of limited staff time. However, this problem is minute in comparison to more global issues that inhibit the new business formation and survival process. The magnitude of these problems renders them outside the total control of MTE, yet this has not stopped certain new initiatives which are aimed at alleviating certain aspects of the problems within Massachusetts.

These global issues are described in general terms below. The next section on "New Initiatives" will describe parallel initiatives recently undertaken by MTE that address the problems.

The Capital Shortage. Knowledgeable observers maintain that there has always been a shortage of capital available to fund new business start-ups. If this is true (and we believe it is), then private capital for "pre-start-up" product development activities has been almost non-existent.

The current dislocations in the capital markets have been well documented. While all observers don't agree on the magnitude of the capital "shortfall" in the United States, most do agree that a shortage of capital does exist and will persist for about the next decade. The implications of this private capital shortage, coupled with cutbacks in Federally-sponsored private industrial R&D, are severe for the growth of new, high-technology enterprise. New business start-up situations are rare indeed today as the limited pool of private capital is allocated toward an increasing number of lower risk, higher return alternatives. Less R&D is being performed, in real-dollar terms, with an adverse effect upon technology spin-offs into commercial usage. Finally, entrepreneurs and innovators must rely exclusively upon personal financial resources to fund the "pre-start-up" product development activities that the necessary precursors to new enterprise formation.

MTE has recognized an opportunity for government to perform a highly useful (indeed, critical) role in the process of technology commercialization. By providing appropriate capital incentives, government can intervene in the private capital allocation process and induce earlier and greater private capital participation in the process of new enterprise development. This can be done without violating government's public interest mandate and with no net outlay of public monies in the long run. World-wide precedents exist for such a governmental function, and the Massachusetts Technology Development Corporation is the result of two years' research for just such a mechanism to exist in the Commonwealth.

Revenue Generation Problems of Small Companies

It is axiomatic that smaller firms suffer from a lack of resources, not the least of which are the time, money, and expertise required to secure accurate, detailed information on new market opportunities to which the firm's technical expertise can be applied. Identified market needs are the only proper motivations for new product development, and the criticality of accurate marketing information prior to and during the product development phase cannot be over estimated. The limited resources of small firms make equally limited the options available to procure market intelligence. Accordingly, major commitments of corporate resources are made on the basis of poor market perceptions and often only the "gut feel" of the entrepreneurs.

Regardless of size, a firm's revenue base is the handmaiden of continued success. For the smaller firm, accurate information on new market opportunities is made difficult by the firm's limited resources of time and money. Often, the firm is not even aware of new opportunities within its own geographical area. Also, a consideration of product licensing or overseas sales opportunities is left undone, due to a lack of time or knowledge regarding the mechanics of such investigations. This is unfortunate, since such revenue-producing tactics, once in place, can provide unusually high contribution margins, relative to the actual manufacturing and distribution of goods in the domestic marketplace.

MTE has undertaken new initiatives to bring more marketing expertise to small firms by tapping available talent that will work essentially free of charge.

Industrial Design Requirements of Smaller Firms

The importance of creative, cost-effective packaging, attractive corporate logos, and the exterior appearance of products is vastly underestimated in terms of the impressions made upon potential customers. Small firms must use "all the tricks in the book" to establish their competitive posture in the marketplace. Unfortunately, industrial design issues are usually last on the list of options considered by smaller firms to express their distinctive competence.

If industrial design services could be had on a no-fee or contingency basis, the use and effectiveness of such marketing tools could be greatly enhanced. MTE has undertaken just such an initiative.

Problems of Economically Disadvantaged Areas

The Governor of the Commonwealth has embarked upon a publicly-stated economic policy of "growth from within" that focuses upon the existing

industrial and resource base within the State. Particular attention is to be devoted to "revitalization" of the older cities and towns.

MTE is encouraged by this publicly-stated policy and will attempt to use its expertise in promoting economic development activities that directly create new job opportunities within the economically disadvantaged areas. A three-staged attack is envisioned on the complex set of problems facing these older areas:

- (A) Comprehensive economic planning designed to coordinate state, regional, and municipal long-term growth patterns.
- (b) Physical infrastructure (transportation, utilities, land use, etc.) improvements intended to upgrade the quality of life and work in the area.
- (C) Economic development initiatives that will generate new employment in new industries or in older businesses that have redirected their markets.

MTE can apply its expertise most productively in the latter stage above. If monies are made available for this purpose, MTE can use its access to technological and business talent, making such resources available for planning the rejuvenation of existing industry.

MTE's experience has been that many businesses within the disadvantaged areas are closely-held family enterprises that suffer from antiquated facilities, high labor-content products, a poor financial condition, and a lack of incentive and know-how to risk product diversification. "Economic development" in such an environment requires an infusion of fresh talent, backed by financial incentives for market diversification. MTE has the "people resources" at hand to orchestrate such a program. Presently, mechanisms are being explored to effect proper coordination among all public and private interest groups and to seek both planning and implementation funding.

Legalities of Incorporation

A step that all new firms must undertake, the process of formal incorporation can take on varying degrees of expense and complexity, depending upon the knowledge (and ethics) of the legal counsel involved. In actuality, once a knowledge of the state's incorporation statutes are in hand, the process should be "painless" and simple.

MTE has acquired such a familiarity and is in a position to help its clients through this formality, at a minimum of expense and time.

Qualifying Technology-based Small Companies for MTE Assistance

Over the five year operating experience of the MTE, there has been a gradual change in the approach used to contact prospective clients. These changes have resulted from a continuing assessment of the needs of perspective clients, an evaluation of alternative approaches as well as limitations of MTE staff imposed by funding constraints.

Initially, MTE personnel operated as active "field agents" to stimulate new business enterprise and to assist in the preservation of existing small enterprise. The field activity was modeled after the "county agent" approach developed by the U.S. Department of Agriculture extension services. Field calls were made on a random basis on small companies in the energy, biomedical instrumentation, electronic, computer and software industries. The emphasis in the field activity was to bring technology into small companies so as to enable them to generate new revenue and hire additional people. As a result of this effort, the MTE gained exposure, developed a broad base of valuable resource contacts and established credibility. Equally important, it was determined that technology was not the only element in the "exchange process". People, capital and user demand are also critical. However, without "high risk" capital, the elements will not come together and the process will be deferred or aborted. The Massachusetts Technology Development Corporation (MTDC) represents an initiative to implement the "exchange process" and facilitate the process of business formation. That initiative was described in an earlier report. Additional progress has been made on that initiative. It will be described in a later section of this report.

With the increased number of referrals that have resulted from the MTE's on-going activity and additional new contacts with innovators/entrepreneurs, it has become clear that, with the limitations of a small staff, a more focused effort was needed in the field activity. The approach that is being utilized to achieve that "focus" is described in the initiative that has been made with the Massachusetts Department of Commerce and Development.

New Initiatives Related to Identified Problem Areas

The legislative proposal (House Bill 455, Senate Bill 111) to establish the Massachusetts Technology Development Corporation is the result of two years' research into capital stimulation mechanisms for technology development in other countries and the United States. The MTDC proposal is particularly timely, in view of growing national capital shortage (especially in the area of capital available to new, high-technology enterprise) and the chronically depressed state of the Massachusetts economy.

An exhaustive description of the MTDC concept is included in Appendix I. To summarize, MTDC provides financial incentives to induce the earlier and greater participation of the private financial community in the process of product development leading toward new enterprise formation. MTDC would operate as an independent, non-profit, public corporation, yet would possess all of the professional and managerial aspects of a private financial institution. MTDC's financial incentives would take the form of guarantees to private investors during the product development phase of new enterprise formation or, less preferably, direct financing of product development in order to demonstrate commercial feasibility to a skeptical investment community. In return, MTDC would require continuing royalties on sales of successful products and all resultant industrial activity to remain in the Commonwealth for at least fifteen years.

MTDC is unique from other organizations world-wide with similar expressed purposes in two key respects:

- (a) The economic impact of development projects is given consideration equal to the prospects of financial pay-off. MTDC's purposes are public purposes and thus allows it to assume a risk posture more oriented toward a project's job creation potential and less inclined toward profit maximization.
- (b) The use of guarantees has no historical precedent in the stimulation of technology development. More than serving to utilize private financial resources to the fullest, the guarantee mechanism induces existing business and technical expertise to actively participate more frequently and at an earlier stage in development projects. In contrast, other organizations world-wide pursue a policy of directly contributing an average of 50% of a project's development cost.

Conservative forecasts using the historical performance of similar organizations show that if MTDC were to receive \$500,000/year, as start-up financing for the first five years, 1100 new, direct manufacturing jobs, \$5.5 million in state and local taxes, and 22 new firms with aggregate revenues of \$21 million annually would be created by the end of year 10. Moreover, MTDC would be totally self-sufficient at the end

of this period and could cover all administrative and investment expenditures out of income from prior investments.

Initiatives that have been taken by other countries strongly affirm both the need and workability of the MTDC in Massachusetts. In Japan, the MTDC legislation was translated into Japanese and enacted on a national scale. The resultant Japanese Venture Enterprise Center (VEC) is a consortium of government and industry "subscribers" that collectively fund the development of new technologies which are subsequently "placed" within the organizational framework of "chosen" member firms. VEC has sold subscriptions totalling \$3.6 million to approximately 200 firms, and, at present, 16 "development" situations are in the process of being funded. Amazingly, all of this activity has transpired since the summer of 1975.

The policy of the Japanese Government to undertake "direct measures" to develop and commercialize technology so as to stimulate the process of business formation and create jobs was reaffirmed by the Principals of VEC during a visit to Boston in March 1976.

Fred Markey, a Deputy Commissioner of the Massachusetts Department of Commerce and Development, requested that the Foundation host the VEC group on their visit to Boston. The group was led by Dr. Tadeo Kiyonari, a Professor at Hosei University, a Director of VEC, and one of the leading figures in the venture capital community in Japan. The areas of primary interest of the Japanese group were as follows:

1. The organizational and financial relationships between the venture capital community in the United States and technology-based start-ups.
2. Techniques which are used by venture capitalists to evaluate and assess innovations which are developed by innovator-entrepreneurs and which serve as the basis for technically-oriented new enterprise.
3. Future prospects for technically-oriented start-ups including a discussion of some proposed mechanisms in this country to facilitate the process of business formation.

The debate over the availability of "high risk capital" continues; "high-risk capital" is essential to create new technology-based enterprise or to commercialize technology to enable on-going business to generate new revenues and thereby hire more people. Some observers maintain that there has always been a shortage of capital to fund technology-based new enterprise; others contend there is sufficient capital available, but it is improperly allocated. This latter view is the basis for the axiom, "When capital is needed it is not available...when capital is not needed it is!".

Review of a current real business case is instructive as to how lack of risk capital stalls the enterprise, causing the community to miss a chance for jobs and an industry to miss an efficiency gain.

The Syncomp Operating System

- A Case Study in the Impediments to Technology Commercialization -

The computer age arrived approximately at mid-century and almost immediately it was evident that any industry, whose main business was processing information, would be overtaken, in technology, by the modern digital computer. Two of these industries in which it was anticipated that the impact would be early and severe, were the newspaper and graphic arts composition industries. While these two businesses had common equipment interests, their fundamental problems differed in important ways. Roughly the newspaper industry succeeded in its confrontation with the computer, while the graphic arts composition industry did not. The latter, which recently employed thousands of workers within the Massachusetts economy, is divided into book compositors, advertising typographers, financial printers, specialists in legal typesetting and firms that service the scholarly journal, periodical and magazine market.

A recent attempt to consolidate six major producers in the Boston area revealed the present economic agony of the graphic arts composition industry, primarily caused by its poor response to the computer. Although its troubles are frequently interpreted as due to the cost of labor and inflation in the present business environment, the real crisis is technical and the condition can be flatly ascribed to inadequate technical leadership, as represented by trade associations and traditional equipment suppliers. Demand for the products of this industry increased throughout the period of its technical/economic crisis.

The response to technical challenge by equipment suppliers was narrow, in the view that an opportunity existed to market computer age "entry level" equipment as "computerized typesetting". The actual technical reach of the computer, as a new prime mover of information, that would soon find means for completely electronic typographic composition, was ignored in the rush to market "reinvestment in typography" as financial and equipment packages, that became known as "turnkey systems". Such hybridized computer-typesetting systems did not address the central problem of the industry -- the cost of its product to the customer.

The real value of the digital computer was to be that of a means of lowering cost, primarily by employing it as a tool of the human mind to increase productivity of a highly professional labor force, which heretofore had been chiefly occupied in mindless manipulation of symbols. Not only is the digital computer good for mindless manipulation, as a clerical assistant, it has other more important abilities as a perceptual and modelling tool to extend the reach of a professional.

The Syncomp Operating System, developed by Caulfield Associates, incorporates these features and has been in pilot commercial operation in the competitive world of textbook composition, for over three years. The specific implementation of Syncomp has enabled the system to create products for the graphic arts industry at a manufacturing cost that is two thirds its previous cost, with no decrease, whatever, of its qualitative or diversity standards. Basically this is accomplished by introducing the full power of the computer to the existing qualitative craft environment. The resulting increase in labor productivity lowers the overall cost of labor by about fifty percent, but not the income of the highly qualified craft professional.

Technically, the Syncomp System is a high performance Turing machine superimposed on the normal modality of a fourth generation computer installation, with massive storage capacity. In operation the system is virtually human in its rationality and biological in its generative power of infinitely diverse typographic composition products. Artificial intelligence features of Syncomp are contained in a surface language and stored knowledge about the micro-universe of typographic composition. Its output drives a video typographic compositional device (existing machine) which in turn utilizes digital fonts (also existing). The practice transforms the traditional industry to the purview of the newer more comprehensive world of data base management.

Technically, great leverage would accrue from funding Syncomp because development is already complete (elsewhere and at great expense) on the video typographic compositional device and the digital fonts.

Timeliness of risk capital, in this case, would have caused a net saving in capital needs of the book publishing industry in this community. Local typesetting/printing firms jointly bought available equipment, lacking awareness of the Syncomp effort, at a cost of approximately 5 times Syncomp's capital need. Yet this jointly purchased equipment amounts to only a stop-gap measure to aid declining profitability and would be completely obsoleted by Syncomp's advancement.

Programs with Local Business Schools

A number of local schools of business administration require intensive field work or study projects as part of the graduate curricula. The degree to which these projects relate to "real-world" problem-solving has a proportionate effect on the educational experience. Unfortunately, there is little coordination of these projects, both within and between graduate schools. Moreover, faculty have a difficult time finding the desired quantity and quality of research topics.

MTE views these required field projects as resources to be used by small firms. Certainly the price is right, and if firms are willing to devote the time, the payoff may be in-depth marketing intelligence that will materially affect the management decision process.

Accordingly, MTE has initiated field project programs at the graduate business schools of Boston College and Northeastern University. More schools will be contacted as warranted by the quantity of potential projects. Working with the schools' faculties, MTE will select some of its clients as candidates for student field projects. Projects will deal with identified client needs, mostly of a marketing or financial planning nature. Students will select those projects which appear most interesting and, working through MTE, establish contact with the small firms to specify the content and output of the project. At the end, the firms will receive a final report detailing the findings and recommendations of the study team, and the students will obtain course credit for their efforts.

Thus far, MTE has successfully organized 18 student projects aimed at providing critically-needed information and analyses on topics affecting either individual firms or communities. All involved in these cooperative projects feel that it was a most worthwhile exercise, and future student projects are planned for the spring of 1976.

In one instance, a student project identified market opportunities to which a declining firm in the shoe industry could direct its manufacturing expertise. A doubling of revenues was the reported result for the firm. In another instance, a student project investigated the mechanics of Federal economic aid to a community under various programs. The information obtained provided a catalyst for the community's solicitation for economic aid to the proper Federal agencies.

Program with the Massachusetts College of Art

In a manner similar to the initiatives with local business schools, students at the Massachusetts College of Art will receive course credit for solving industrial design problems of selected MTE client firms. Again, the service comes free of charge, and the firm's only commitment will be the time allocated to working with students in order to specify the design problem and judge the results.

Initiatives with Economically Depressed Areas

MTE's second level of activity concerns its desire to become a party to any programs designed to relieve problems in the state's economically disadvantaged areas. As mentioned before, these programs would have three basic elements: comprehensive economic planning, physical infrastructure improvements, and grass-roots economic development (i.e., new employment creation). MTE does not possess recognized expertise in the first two categories. However, MTE strongly feels that the strategic components of economic development initiatives should include the promotion and fostering of new industries within the affected areas. If a portion of the overall development monies can be set aside to promote new industrial formations within the disadvantaged areas, MTE is convinced that it has the resources and expertise to bring about new industries and/or the redirection of existing businesses, based upon the commercialization of technology.

Two initiatives are already underway that address the problems of economically disadvantaged areas:

(A) The City of Lynn

The Lynn Department of Community Development (Lynn DCD) contacted MTE nearly 9 months ago in its effort to redirect its economic base into more viable industries as well as to suggest various options to assist on-going small businesses presently operating in Lynn.

Industries in the City of Lynn have historically concentrated in the shoe trades. The effects of imports and lower labor costs in the southern U.S. have decimated many Lynn-based manufacturers. In cooperation with MTE, the Lynn Economic Development Office launched a mailing campaign to all 200 manufacturers. This campaign was to inform businessmen of the types of Federal assistance available and to solicit their further interest if eligibility for federal assistance could be determined. About 20% of the firms responded positively, and MTE is assisting the city in judging the eligibility of both individual firms and the city itself under the Trade Act of 1974.

Assistance to On-going Small Business - At our request, the faculty at the Graduate Business Schools at Babson College and Northeastern University have had graduate students conduct studies on small businesses in Lynn. The focus of the studies is to suggest alternatives that will enable a business to redirect its resources to reverse present declines in revenue or to suggest alternatives that would enable a business to exploit a new market while utilizing existing plant equipment and expertise. Several of the studies are especially noteworthy.

Student studies, under the guidance of MTE, have pointed out the various assistance options available under the Trade Act of 1974. Students were also assigned specific "market opportunity identification" projects for Lynn-based firms. MTE has formed an Advisory Board of economic development experts to advise the City of Lynn in their economic planning efforts.

Lynn Municipal Development Corporation - In order to have an identity for economic development, activities such as utilization of Section 502 Loan Program of the SBA, the "Lynn Municipal Development Corporation" was formed with MTE assistance, effective June 1, 1976 (a copy of the Articles of Organization is included in the appendix).

Lynn DCD/Footwear Research Center (FRC) - For many years, Lynn was the shoe manufacturing center in the U.S. This project was initiated by MSTF to restimulate that industrial base, given the fact, that the relevant expertise and technology still resides in the general community. Professor Charles Collazzo of Northeastern University, who has written extensively on the footwear industry, is working actively on the project. The first meeting to launch this effort was held with key personnel at the U.S. Army Natick Labs, the Clothing, Equipment and Materials Research Center for the U.S. Military. It is anticipated that a Footwear Research Center in Lynn

will create approximately 150 jobs and serve as a vehicle to develop policy, initiate demonstration projects, and bring in public capital to revitalize the shoe manufacturing industry in this area.

Lynn DCD/Trade Act of 1974 - Our involvement in this project arose through discussions with Paul Aylward of the Boston office of the U.S. Department of Commerce International Trade Program. Title II of the Trade Act provides economic adjustment monies to firms and/or communities that can prove positively that they have been adversely affected directly as a result of increased imports in certain industries. We are serving in a coordinative role on this project and have recommended expert counsel through a top Washington law firm.

Survival '76 Lynn - We have worked actively with Lynn DCD in preparing for this seminar which was held on April 20-21, 1976 (announcement is included in the appendix). It was modelled after the Survival '75 seminar at Wellesley College which was a huge success. Ninety-three small businesses and twenty large purchasers participated. Our initiatives were responsible for nearly 50% of the small business attendees. From the seminar \$1.5 - 2 million of incremental local small business revenue has resulted. One additional Survival '76 seminar is scheduled at another location.

(B) The Cities of Lowell & Lawrence

These two cities have suffered irreparable economic setbacks as a result of the declining New England textile industry. In cooperation with the local office of the Fifth Congressional District, MTE has begun an "educational campaign" to inform local leaders of the types of assistance available under the Trade Act of 1974 and the EDA programs, as well as the eligibility requirements to receive such aid. Strong interest has been demonstrated in these programs, and the Office of State Planning has become involved as a result.

Revenue Generation for Technology-Based Small Companies

Overseas Sales Representation. MTE has established working relationships both with the U.S. Department of Commerce's local International Trade Specialist and a number of private overseas trading brokers. These have provided invaluable help to a number of MTE clients in their efforts to set up exporting procedures and overseas sales representation. At least six MTE client firms have experienced substantial overseas revenues as a result of MTE referrals.

Licensing of New Products. Product licensing arrangements present two-fold benefits to the smaller firm. Outside licensing of in-house technologies can allow the firm to accrue additional revenues which can immediately contribute to profit margins. Once a licensing agreement is consummated and engineering support has been provided, resultant royalty income necessitates little or no related expense on the part of the licensor. Alternatively, the licensee of new technology can derive the benefits of new product line revenues with a minimum of product development and marketing expense.

MTE's efforts in initiating cross-licensing agreements for its clients have taken three basic forms. As one tactic, MTE is presently in the planning stages for two product licensing seminars that will educate small firms in the particulars of such agreements and identify organizations that can assist small firms, either as licensees or licensors. These seminars will be sponsored, respectively, by the SBA and by the Smaller Business Association of New England.

The second tactic involves the solicitation of licensable products or processes from the area's larger firms that might be of interest to smaller firms wishing to diversify or augment their revenue base. While this tactic has certain inherent problems, not the least of which is the "not invented here" syndrome, successful agreements can mean the difference between the mere existence and major expansion of a small firm.

The third tactic is part of MTE's on-going "need matching" activities on behalf of its client firms. Whenever possible, MTE attempts to transfer technology between one client firm and another. In at least two instances in the recent past, this has resulted in successful licensing arrangements that have contributed to the revenue base of both firms involved. At present, another such licensing agreement is in the works between a firm specializing in coaxial, multiplexed data telemetry systems and a firm manufacturing burglar and fire alarm systems for office buildings.

Sponsorship of Survival '76 Conferences. Many smaller firms suffer from a lack of awareness of market opportunities in their own "backyard". The purchasing requirements of larger firms in the area, if known in specific, can represent major opportunities for those small firms with enough initiative to acquire such a detailed knowledge. Often, however, the size and complexity of large-company procurement requirements can frustrate even the most aggressive sales efforts of small enterprise.

In response to this apparent underutilized opportunity, MTE participated in the organization and management of a seminar entitled "Survival '76", similar to the very successful Survival '75 seminars. Large firms (procurers) and small firms (suppliers) are brought together in a practical, interactive exercise designed to facilitate the matching of procurement needs with small-firm capabilities. The appendix contains additional documentation on "Survival '76".

MTE Designed Standard Format for Incorporation

When a firm decides that it is appropriate to formally incorporate, a number of problems ensue, not the least of which are the expense (\$1000 - \$2000) and "synthetic" complexity imposed by the legal profession. Since this is an issue common to all firms, MTE undertook to eliminate much of the mystery and confusion from the legal incorporation process by developing a more-or-less "standardized" check list and format that is applicable to the majority of incorporation situations. Now, by working with MTE, the incorporating firm requires minimal legal assistance while covering all of the steps necessitated by law. The result is a substantial savings in legal fees.

Mr. Bob Freedman, MTE Field Representative, is principally responsible for this effort. An outline of his "incorporation format" is contained in the appendix. Only an outline is shown, since the extent of his documentation is too large for total inclusion in the report.

MSTF/Massachusetts Department of Commerce & Development (DCD)

1. Referral Program - Shortly after John Marino was appointed Commissioner at DCD, a program was initiated to reorganize the Department. As part of that reorganization, the state was divided into five economic regions, each of which has a Director. Deputy Commissioner, Hugh Redford, was given overall responsibility to manage the activities in the 5 regions and develop policy to implement DCD programs. Commissioner Redford has designated the MTE as a "resource that can be called upon frequently to assist companies with growth potential". It is his contention that the MTE operates in a sector in which a substantial part of the future growth in jobs will come in Massachusetts. Fred Markey, the Deputy Commissioner, whose responsibilities include "Special Projects", has also solicited MTE help in assisting technology-based small companies, noting that DCD's capability was limited in this area. These initiatives have already produced a number of referrals.

2. Economic Development Advisory Council - The MTE was invited to sit on this Council. The Council was organized and is chaired by DCD Commissioner John Marino. It consists of an assemblage of individuals from the public and private sectors with expertise in economic and industrial development. The purpose of the Council is to review operations at the DCD and to recommend changes in the structure, decisions and programs at DCD.

3. Task Force on Capital Formation for Economic Development - The Capital Task Force was established by the Governor in response to the New England Regional Commission's recommendations for capital and labor market stimulation in New England. Chaired by DCD Commissioner John Marino, the Task Force will investigate specific capital formation mechanisms and offer a legislative proposal package by June 30, 1976. MSTF sits on a sub-committee of the Task Force, in the area of new technology/new enterprise financing.

Initiatives with Other Agencies in State Government

1. Office of State Planning (OSP) - We maintain regular contact with OSP especially in the area of economic planning. One such contact that is significant resulted from our participation in the MIT Wednesday Morning Breakfast Group. At one meeting, OSP submitted a Statewide Economic Development Planning Proposal. OSP sought out MTE to comment on and to suggest approaches to implement the programs relating to the early stages in the process of economic development. The program

initiatives were included in the draft of their monograph "Towards a Growth Policy in Massachusetts."

2. Legislative Committee on Science & Technology - Dr. Chandler Stevens, Director, has solicited our expertise and contacts within the technological community. Dr. Stevens is responsible for marshalling scientific knowledge as an input to the process of judging the merits of legislative proposals. MSTF can assist in the area of technical studies organization and ad hoc task force creation.

New Product Development Activity

1. MTE helped plan and present a Small Business Association of New England (SBANE) "50X50" Program Seminar in new product development methodologies. In conjunction with Buckley & Co., MTE brought in three product situations as case examples for seminar participants. As an aside, one of the situations may ultimately find private financing as a result of exposure during the seminar.

2. With the British Consulate-General (Commercial) in Boston, the MTE has developed a working relationship in which the National Research & Development Corporation and major British companies make available know-how and capability on technology that is available for manufacture under license in the U.S. A similar relationship has been made with the Innovation Development (I.D.) Conseil in Paris, France.

Solar Energy Research Institute (SERI)

MSTF's unique relationship with the local technical, academic, and industrial communities is a major resource employed in New England's proposal for SERI -- a project to be funded by ERDA, beginning in 1977.

MSTF has assumed a major role on behalf of Massachusetts in the identification and commitment of appropriate personnel and facilities for SERI. Also, MSTF will have a significant input to the concepts proposed for SERI's management and organization, as well as being involved in the "technology transfer" function, should SERI come to New England.

The deep involvement in this important regional proposal effort is indicative of MSTF's credibility and reputation for "getting the job done" within local political and technical circles. Certainly, if New England's proposal is selected by ERDA, the economic payoff to the region will be well worth the Foundation's intense participation.

APPENDIX I

Documentation for the Massachusetts Technology Development Corporation

This appendix includes:

1. Executive Summary of "A Proposal for Funding Support to establish the Massachusetts Technology Development Corporation", a document prepared by MSTF. The entire document may be obtained from MSTF at a charge to cover reproduction.
2. Written Testimony, submitted to the Joint Committee on Commerce and Labor, The Great and General Court of Massachusetts, February 19, 1976, in reference to House Bill 455 and Senate Bill 111.

THE MASSACHUSETTS TECHNOLOGY DEVELOPMENT
CORPORATION

- A Proposal for Funding Support -

I. Executive Summary

Public sector direct fiscal support of private research and development is enormous and has grown to become a well-entrenched national policy. Capital assistance to fixed asset expansion of established firms, while not as large, is also an accepted government policy. Unfortunately, few publicly-sponsored mechanisms have come forth to assist in the "middle ground" of developing industries based upon commercialization of R&D results.

The type of capital implied in this effort is not "venture capital" in the traditional sense. Even in the go-go days of venture investment, situations had to demonstrate a working prototype, superior management, and the beginnings of market acceptance in order even to be considered. While it is widely agreed that venture capital has all but disappeared from the financial scene (and indications are that it will never return to the previous levels), this circumstance only serves to exacerbate a situation whereby technology commercialization is totally reliant upon the financial resources of the innovator or his corporate employer.

The resultant economic benefits of increased employment and productivity are considerations too close to the public interest to allow the commercialization of technology to remain the exclusive province of capricious forces in the private sector. Publicly-sponsored capital stimulation incentives are required to make private resources, both managerial and financial, more effective in the process of technology commercialization.

The mechanisms of the proposed Massachusetts Technology Development Corporation (MTDC) will perform just such a stimulative function. Through the option of guarantees of a portion of private investment, MTDC will serve to attract more private capital earlier in the process of product development than would be available without such incentives. As a last alternative, MTDC will provide direct financial assistance to promising projects in order to demonstrate commercial feasibility to skeptical private investors. Rather than supplanting private investment, MTDC will operate as a fiscal stimulus to induce the earliest possible private participation.

MTDC cannot hold equity in private corporations. In return for financial assistance, MTDC will require that all aid be repaid through contractually determined fees or royalties on sales and further require that a continuous royalty income be paid to MTDC which shall be reinvested in new development projects. Finally, any MTDC-sponsored development project will be required to maintain subsequent industrial activity within the Commonwealth so the benefits of increased employment and tax revenues can accrue to the citizenry.

Public sponsorship of technology commercialization is not unprecedented. 15 major countries and one U.S. state have such organizations in place. The historical success of such organizations bodes well for the future of MTDC. However, MTDC is methodologically distinct from predecessor organizations through its encouragement of maximum private participation at the earliest possible time. Moreover, the guarantee mechanism is without precedent and offers a greater multiple of effectiveness on public funding.

MTDC will not pursue a profit maximization philosophy. Rather, the prime objective is to achieve the benefits of increased employment and tax revenues through the successful commercialization of technology. Even under this public-interest mandate, a \$3.5 million public investment in MTDC will allow self-sufficiency in 10 years and produce the following projected economic benefits in the same time period:

New Jobs (Direct)	1100
New Corporate Sales Revenues	\$21,000,000 annually
New State and Local Taxes	\$5,500,000 (total, 10 years)
New Firms Created	22

Accumulated income to MTDC over the first 10 years is projected at \$2.4 million and will be sufficient to allow repayment of all public monies. While the \$3.5 million 10-year public investment in MTDC is judged the minimum necessary to achieve a substantial economic impact, larger investments for MTDC start-up operations would produce proportionately larger economic benefits.

Indeed, few government-sponsored economic development initiatives can boast such an impressive (and permanent) economic impact derived from such a small public expenditure.

Massachusetts Science and Technology Foundation

THE MASSACHUSETTS TECHNOLOGY DEVELOPMENT CORPORATION

HOUSE: 455

SENATE: 111



Governing Board

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Donald B. Sinclair

Robert C. Sprague

Jerome B. Wiesner

Executive Secretary

Joel Orlen

Director

John P. Silvers

A Bill Creating a Public, Non-Profit Corporation to Stimulate Greater Private Investment in New Technology Enterprises in the Commonwealth and thus Generate New Jobs.

Written Testimony, Submitted to the Joint Committee on Commerce and Labor, the Great and General Court of Massachusetts

February 19, 1976

THE MASSACHUSETTS TECHNOLOGY DEVELOPMENT
CORPORATION (MTDC)
(Synopsis)

The Need

- Public sector provides billions in support of R&D (on the one hand) and financing for established businesses (on the other): Financing for new enterprise development is left to the private sector, mainly the entrepreneur himself (see attachment).
- Recent shrinkage of private equity and "venture capital" markets stifles the formation of new enterprise, and the job potential of new industries is lost forever.
- Massachusetts is particularly dependent on industrialization of new technologies for new job creation. Some of our largest corporations (Digital, Polaroid, Raytheon, Data General) resulted from successful commercialization of technologies since WWII. In today's capital climate, these large employers would never have gotten started.

Purpose of MTDC

- Hasten and multiply the incidence of new product development and new enterprise formation which will result in new local industry and thus new jobs.
- Through the use of incentives, stimulate earlier and greater venture investment from traditional private financial sources, as well as private individuals, institutions, and industry.
- Not profit maximization but maximum economic return to the Commonwealth (new jobs, new tax revenues, etc.) while attaining fiscal self-sufficiency through continuing royalties and fees.

The Payoff to Massachusetts

- A \$3.5 million public "investment" in MTDC over the 1st 5 years of operation will produce:
 - 1100 new direct jobs (10th year)
 - \$21 million annual sales of new corporations (10th year)
 - \$5.5 million new state and local taxes (total, 10 years)
 - 22 new firms (end of 10 years)
- More importantly, the "seeds" of new, permanent, and growing industries will have been planted that will continue to grow and contribute to the State's economy.

- In addition to the above, continuing royalties and fees to MTDC will allow repayment of all public monies and further allow MTDC to achieve financial self-sufficiency. Thus, MTDC presents no net cost to the taxpayer, in the long term.

Organization

- MTDC is an independent, non-profit, public corporation (similar to MHFA and CDFC)
- Governed by a 9-man Board:
 - Economic Affairs (ex officio)
 - Admin. & Finance (ex officio)
 - Massachusetts Science and Technology Foundation (ex officio)
 - Six Appointees by Governor
- Executive Director and small expert staff will manage day-to-day operations. All investment decisions must receive Board approval.

Operating Policies and Mechanics

- Product development proposals will be submitted by entrepreneurs and receive an initial expert review by MTDC staff. Staff expertise will be augmented by an informal network of advisors who will lend assistance and counsel in areas of detailed technical and business knowledge.
- The burden of proof rests with the applicant to demonstrate that private financial assistance is unavailable without MTDC participation, that the proposed project has a reasonable chance of commercial success and, most importantly, that the project will make an important contribution to the Massachusetts economy (new jobs, taxes, corporate revenues, etc.).
- Upon approval of the Board, MTDC has two basic options for providing financial assistance to development projects:
 1. (Preferred) A guarantee of a portion of private financing. MTDC's guarantee exposure is limited to a maximum of \$300,000/project. In no instance would MTDC guarantee greater than 80% of outside private investment.

Through the use of guarantees, MTDC offers incentives to private investors by limiting their "downside risk" and inducing more management participation and technical expertise into a project than otherwise would occur.

2. Direct financial assistance, up to a maximum of \$150,000/project.
- In return for financial assistance, MTDC will require that the applicant contractually commit to:
 1. Repay MTDC's financial assistance through royalties on sales or a negotiated fee.
 2. Provide continued royalty or fee payments over and above the initial financial assistance.
 3. Maintain a substantial portion of industrial activity in Massachusetts so long as any financial obligation to MTDC is outstanding.
 - MTDC will not take equity in any firm. Moreover, its orientation toward risk will incorporate a consideration of a project's economic payoff to the State, as well as potential project profitability. This is a different (and more constructive) orientation than pursued by private investors alone.

Funding and Fiscal Responsibility

- The "faith and credit" of the Commonwealth is not pledged in the contractual dealings of MTDC. Any obligation of MTDC is a claim only upon MTDC itself.
- MTDC cannot issue bonds. Initial funding for MTDC can only come from state appropriations: public and private grants. Continuing income will be derived from royalties and fees paid by successful development projects.

Precedents and Support for MTDC (Sampling)

- Successful publicly-funded technology development and investment mechanisms exist in Great Britain, France, Japan, Germany, and Canada, among others.

- Connecticut Product Development Corporation (CPDC) enacted in 1972, with \$10 million in bonding authority. After start-up delay of 2 years, CPDC has funded 6 projects with initial royalty payments already received.
- The EDA and Federal Bureau of Standards has expressed strong interest in MTDC as an "experiment" in technology commercialization and job creation. Since both funded initial start-up expenses of CPDC and MTDC is substantially different, equal levels of funding (\$400-500K) could be made available to MTDC.
- NERCOM recommends expansion of CPDC concept in all New England States. MTDC is similar enough in intent to satisfy this initiative.

Sample of Supporting Organizations:

- Boston EDIC
 - Mass. Business Development Corp.
 - Middlesex Bank
 - Arlington Trust (Lawrence)
 - Federal Reserve Bank of Boston
 - AIM
 - Many private firms in Massachusetts
 - SBANE
- Japanese "Venture Enterprise Center" created in July, 1974 as "carbon copy" of MTDC. Already funded at \$3.2 million, Japanese "VEC" has sponsored 6-10 development projects.

APPENDIX II

Articles of Incorporation

**Lynn Municipal
Development Corporation**

The Commonwealth of Massachusetts

PAUL GUZZI

Secretary of the Commonwealth

STATE HOUSE
BOSTON, MASS. 02133

ARTICLES OF ORGANIZATION

(Under G.L. Ch. 180)

Incorporators

NAME

RESIDENCE

Include given name in full in case of natural persons; in case of a corporation, give state of incorporation.

John Richard Walton, 23 Waitt Road, Lynn

Thomas J. McIntyre, 185 North Common Street, Lynn

The above-named incorporator(s) do hereby associate (themselves) with the intention of forming a corporation under the provisions of General Laws, Chapter 180 and hereby state(s):

1. The name by which the corporation shall be known is:

Lynn Municipal Development Corporation ✓

2. The purposes for which the corporation is formed are as follows:

To undertake broad economic and area planning engineering, technical, and other related studies, projects, and programs to stimulate economic development and employment opportunities within the City of Lynn; to promote the economic development of the City and to assist in the coordination and promotion of cooperation and mutual assistance among public agencies and private organizations and investors in advancing the economic development of the City of Lynn.

To participate in a Section 502 Loan Program of the Small Business Administration and further, to act as a Local Development Corporation pursuant to same; and to undertake any other activities permissible under Chapter 180 of the Commonwealth.

NOTE: If provisions for which the space provided under Articles 2, 3 and 4 is not sufficient, additions should be set out on continuation sheets to be numbered 2A, 2B, etc. Indicate under each Article where the provision is set out. Continuation sheets shall be on 8 1/2" x 11" paper and must have a left-hand margin 1 inch wide for binding. Only one side should be used.

If the corporation has more than one class of members, the designation of each class, the manner of election or appointment, the duration of membership and the qualification and rights, including voting rights, of the members of each class, are as follows:—

none

Other lawful provisions, if any, for the conduct and regulation of the business and affairs of the corporation, for its voluntary dissolution, or for limiting, defining, or regulating the powers of the corporation, or of its directors or members, or of any class of members, are as follows:—

none

2. By-laws of the corporation have been duly adopted and the initial directors, president, treasurer and clerk or other presiding, financial or recording officers whose names are set out below, have been duly elected.
3. The effective date of organization of the corporation shall be the date of filing with the Secretary of the Commonwealth or if later date is desired, specify date, (not more than 30 days after date of filing.)
June 1st 1976
7. The following information shall not for any purpose be treated as a permanent part of the Articles of Organization of the corporation.

a. The post office address of the initial principal office of the corporation in Massachusetts is:

Ro. 302 (Mayor's Office) Lynn City Hall, Lynn, Mass. 01901

b. The name, residence, and post office address of each of the initial directors and following officers of the corporation are as follows:

	NAME	RESIDENCE	POST OFFICE ADDRESS
President:	John R. Walton	23 Waitt Road	Lynn
Treasurer:	Thomas A. McIntyre	81 North Common Street	Lynn
Clerk:	Wilbur Cusack	39 Pleasant View Avenue	Lynn

Directors: (or officers having the powers of directors)

John R. Walton

Thomas A. McIntyre

Wilbur Cusack

same as above

c. The date initially adopted on which the corporation's fiscal year ends is: June 30

d. The date initially fixed in the by-laws for the annual meeting of members of the corporation is:

3rd Tuesday of July

e. The name and business address of the resident agent, if any, of the corporation is: None

IN WITNESS WHEREOF and under the penalties of perjury the above-named INCORPORATOR(S) sign(s) these Articles of Organization this 28th day of May 1976

John R. Walton
Thomas A. McIntyre

Official Note June 1, 1976

16185

RECEIVED

MAY 28 1976

**ORGANIZATION DIVISION
SECRETARY'S OFFICE THE COMMONWEALTH OF MASSACHUSETTS**

**ARTICLES OF ORGANIZATION
GENERAL LAWS, CHAPTER 180**

I hereby certify that, upon an examination of the within-written articles of organization, duly submitted to me, it appears that the provisions of the General Laws relative to the organization of corporations have been complied with, and I hereby approve said articles; and the filing fee in the amount of \$30.00 having been paid, said articles are deemed to have been filed with me this

*28th day
May 1976*

Effective date 6/1/76

PAUL GUZZI
Secretary of the Commonwealth

**TO BE FILLED IN BY CORPORATION
CHARTER TO BE SENT TO**

Wilbur Cusack, Esq.

145 Central Avenue

Lynn, Massachusetts 01901

*UX
LA*

FILING FEE \$30.00

**CHARTER MAILED
DELIVERED**

APPENDIX III

Documentation - Survival '75 - '76 Seminars

U.S. SMALL BUSINESS ADMINISTRATION
150 Causeway Street
Boston, Mass. 02114

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300



POSTAGE AND FEES PAID
U.S. SMALL BUSINESS ADMINISTRATION



SURVIVAL '75

Sponsored by: Greater Lawrence Chamber of Commerce, Haverhill Chamber of Commerce, Greater Lowell Chamber of Commerce, United States Small Business Administration, Smaller Business Association of New England, Massachusetts Department of Commerce and Development, Massachusetts Science and Technology Foundation, Andover Development and Industrial Committee, Greater Lawrence Economic and Industrial Commission, Congressman Michael Harrington, Congressman Paul Tsongas

WILL YOU
BE THERE?

OCTOBER 27 & 28

SURVIVAL '75

SURVIVAL '75 presents a unique opportunity for small businesses to learn how to gain a larger share of this important market.

HOW?

More than 20 of the largest manufacturers in New England and government representatives will participate in SURVIVAL '75 to tell you:

- What they buy
- Who does their buying
- Their delivery requirements
- Their quality requirements

AND...

How a small business can sell their products to the giants.

DID YOU KNOW?

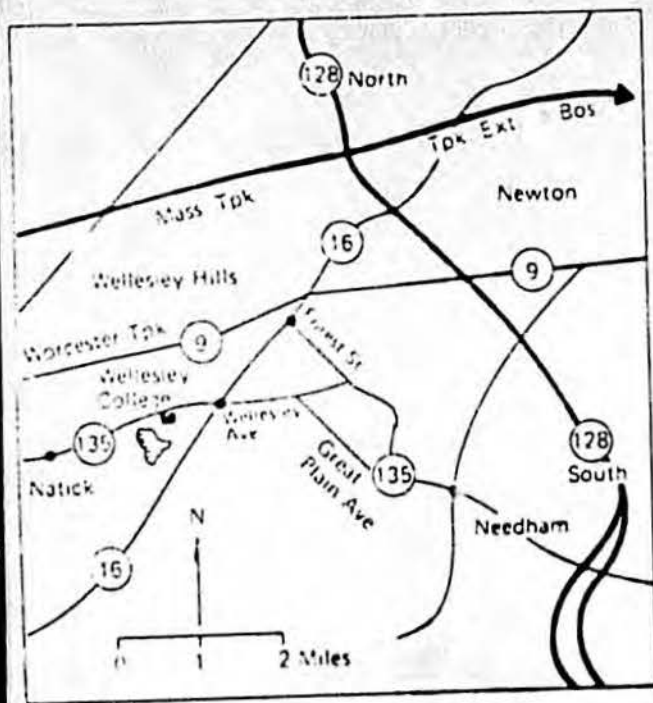
Large New England corporations purchase over \$2 billion worth of goods and services each year. 50% is purchased outside of New England.

WHEN?

The conference will meet from 9 a.m. to 4 p.m. on Monday and Tuesday, October 27 and 28.

WHERE?

On the beautiful campus of Wellesley College, Wellesley, Massachusetts; easily accessible from Route 128 (Routes 9 or 16 exits West) and the Mass. Turnpike (Route 9 exit East) at the juncture of Routes 16 and 135. Registration is at the Jewett Arts Center.



PARTICIPANTS

AVCO Corporation, Digital Equipment Corporation, Gillette Company, Hewlett-Packard, Horleywell Corporation, I.T.&T., Pratt & Whitney, Raytheon Corporation, Sundstrand, Western Electric Company

YOU SHOULD BE THERE . . .

- A schedule of workshops is planned to allow every small company participant to talk with representatives from ten large corporations on Monday, and ten different companies on Tuesday. This is a practical conference designed to maximize the interchange of usable information, with the overall goal of stimulating the region's economy.
- Registration and coffee will be located at the Jewett Arts Center from 9 to 9:30 a.m. Monday, followed by a short welcome and introductions. A buffet lunch will be served each day.
- SURVIVAL '75 will wind up with a brief summary from 3 to 4 p.m. Tuesday, of the critical factors in selling to large companies, and a conference evaluation. Conference costs are \$55 per person for two days, \$30 for one day, including all fees and lunches.

SCHEDULE

MONDAY, OCTOBER 27

- 9:00- 9:30 Registration, Coffee
Jewett Arts Center
- 9:30-10:00 Welcome/Introductions
- 10:00-12:00 Workshops
Founders and Pendleton Halls
- 12:00- 1:00 Buffet Lunch
- 1:00- 4:00 Workshops

TUESDAY, OCTOBER 28

- 9:00-12:00 Workshops
- 12:00- 1:00 Buffet Lunch
- 1:00- 3:00 Workshops
- 3:00- 4:00 Wrap-Up
Jewett Arts Center

COORDINATORS

Herbert Oshan 475-3251 Don Gardner 631-3629
In cooperation with the Office of Special Projects,
Wellesley College, Margaret Lafferty, Director -
235-0320 ext. 688.

☐ YES, I WANT TO BE THERE!

October 27 and 28

NAME POSITION

FIRM

ADDRESS Street/Number City/Town State Zip

TYPE OF BUSINESS BUS. PHONE ☐ \$30 for one day

Enclosed is my check (Payable to SURVIVAL '75)

which covers all conference costs, including registration fee, tuition and lunches

Please indicate which day you will attend.

☐ Monday, Oct. 27 ☐ Tuesday, Oct. 28

Detach and mail with check to SURVIVAL '75, Box 1975, Wellesley College, Wellesley, Mass. 12181
Registration will be limited.

DID YOU KNOW?

Large New England manufacturing corporations purchase over \$5 billion worth of goods and services each year. Over \$2.5 billion is purchased outside of New England. If only a fraction of these purchases were captured by local suppliers, significant new revenue and jobs would be generated and the regional economy boosted.

SURVIVAL '76

A conference which provides an unusual opportunity for smaller businesses to learn how to gain a larger share of this important market and a chance for major contractors to find new local vendors.

HOW?

Twenty four of the largest corporations in New England both manufacturing and service industries and government agencies will participate in SURVIVAL '76 to explain:

- What they buy
- Who does their buying
- Their delivery requirements
- Their quality requirements

AND...

How a smaller business can sell its products to the giants, as well as to each other.



WHEN?

8:45 AM to 4:30 PM Wednesday June 16 and Thursday June 17.

WHERE?

On the beautiful campus of Phillips Academy, located off Route 28 (Main St.) Andover, easily accessible from I-93 and I-495. Registration and the program will be in the Samuel F.B. Morse Hall.

WHO?

SURVIVAL '76 is open to any company, regardless of size, interested in doing business with the twenty-four major corporations and with over 100 other participants attending.

...YOU?

SURVIVAL '76

Follows the successful format of the SURVIVAL '75 conference held at Wellesley College, October 27 and 28, 1975 and the recent SURVIVAL '76 seminar in Lynn, Mass. April 20 and 21. Here's what some participants had to say about these meetings:

"This was the best conference of this nature I have attended so far."

— Jack M. Shannahan, *Purchasing Supervisor,*
Northrop Corporation

"I am confident that our company will benefit saleswise as a direct result of Survival '75, not only from the corporations represented but through contacts made with other businessmen attending the affair."

— David R. Hallett, *Vice President,*
Scandia Plastics, Amesbury, Mass.

"The concept and format of the conference was excellent and enabled buyer and seller to get their interests known to each other in a more efficient and personal manner."

— John J. Cleary, *Senior Buyer,*
Itek Corporation

"After all, contacts and phone numbers are the name of the game, and in two days I got information it might otherwise have taken me months to get hold of."

— Kurt Dexter, *Director of Marketing,*
Innovex Corp., Bedford, Mass.

"I think it has been helpful in learning about companies and opportunities we normally wouldn't pursue. It has saved us a lot of time and money in zeroing in on potential business with a bonus of having names to contact."

— Melvin W. Tracey, *Sales Manager,*
Lytron, Inc., Woburn, Mass.

"An exceptional way of introducing a better channel of communication between companies."

— Valerie Robinson, *Freedom Electronics and Engineering,* Dorchester, Mass.

"It was an excellent opportunity to meet different corporations, and to get into the door."

— John Van der Wal, *President*
Van-Wal Machine, Inc.
Franklin, Mass.

"Congratulations on another good effort this year . . . Your conference should be "required reading" . . . After all there is alot happening here in New England. . . ."

— Richard Heym, *President*
Envirodesign, Newton, Mass.



THE PROOF OF THE PUDDING

As in any procurement assistance activity, the ultimate effectiveness of SURVIVAL '75 must be measured in future business generated by contacts and leads developed at the conference and aggressively followed up. After three months, a survey of the participating companies revealed that:

- 60% of the companies reported new sales directly resulting from SURVIVAL '75
- The average value of the contracts was \$10,000, with at least one of \$30,000
- Over and above the actual contracts signed were twice as many proposals pending
- One company reported new business with 15 of the 20 major corporations
- It is estimated that over \$1.6 million of new business already has been generated and between \$3 and \$4 million by the end of the year

YES, I'll Be There!

Can't come this time, but let me know about future conferences

NAME..... POSITION.....

FIRM..... Telephone.....

ADDRESS.....
Street/Number City/Town State Zip

PRODUCTS/SERVICES..... No. of Employees.....

Enclosed is my check (Payable to **SURVIVAL '76**)
which covers all conference costs and lunches

\$75 for both
days

\$40 for one
day

Please indicate which day you will attend

Wed. June 16

Thurs. June 17

Detach and mail with check to **SURVIVAL '76** c/o Phillips Academy, Andover, Mass. 01810.

This is a tax deductible expense.

As Attendance will be limited, early registration is advisable.

SURVIVAL '76

What distinguishes the SURVIVAL format from the usual trade-fair gathering is the scheduling of small groups of participants into classrooms for half-hour seminars with the purchasing officials of twelve different major corporations each day. The schedule is formal enough to insure efficient use of time, yet flexible to allow maximum personal interchange. The days are demanding, yet rewarding.

LOOK WHO'S COMING TO ANDOVER!

The following major corporations will participate: Avco Systems Division, Compugraphics, Dennison, Digital Equipment Corp., General Dynamics Quincy Shipyard, General Electric Aerospace Instrument and Mechanical Drive Groups, GenRad, Gillette, GTE/Sylvania Electronic Systems Group, Hewlett-Packard, Honeywell, I.B.M., Itek, Norton Company, Raytheon, RCA, Sweetheart Plastics Div. of Maryland Cup, Wang Laboratories, Western Electric, and more.

WILL YOU BE THERE?

If so, detach and mail registration form along with your check to **SURVIVAL '76** c/o Phillips Academy, Andover, Massachusetts 01810. The cost for making personal contact with 24 major corporations and over 100 other solid business prospects is only \$40 per day or \$75 for the entire two-day program. If interested in displays, please contact the coordinators.

SURVIVAL '76

Is sponsored by a broad coalition of business, banking, and government agencies all working together to help stimulate the regional economy. Initial Sponsors include: Andover Savings Bank, Arlington Trust Company, Bay Bank/Merrimack Valley, Compugraphics, Congressman Paul E. Tsongas, General Electric, GenRad, Gillette, Lawrence Economic and Industrial Development Commission, Massachusetts Department of Commerce & Development, Massachusetts Science and Technology Foundation, Smaller Business Association of New England, Union National Bank, U.S. Small Business Administration, Wang Laboratories, and the Chambers of Commerce of Greater Lawrence and Greater Lowell.

Is coordinated by: Herbert M. Oshan and Donald W. Gardner, Jr., who may be reached at (617) 475-3400, ext. 121, for further information.

HOW'S BUSINESS?

If it could be better, this might interest you. . .



"As you know, I heartily support your efforts to stimulate the New England economy by opening up sales opportunities for smaller firms with major contractors."

— John J. Marino, Commissioner
Mass. Dept. of Commerce and Development

SURVIVAL '76

"Often the biggest problem facing business representatives is wading through the maze of divisions, departments and titles within a large corporation to get to just the right buyer"—Electronic Business, Nov. 25, 1975.

If you would like to learn how to do business with 24 corporations such as Digital, General Dynamics, Gillette, IBM, Raytheon and Wang Laboratories, and over 100 additional potential customers in two days, SURVIVAL '76 may be just the ticket for you.

**Will you be one of them?
June 16 & 17**

SURVIVAL '76

c/o Phillips Academy
Andover, Massachusetts 01810



APPENDIX IV

**MTE Designed Standard
Format for Incorporation**

APPENDIX IV

Outline of MTE Legal Incorporation Format
(by Robert Freedman)

I. Required Governmental Forms

- A. Application for Federal Tax I.D. Number
- B. Application for Mass. Re-sale Tax Exemption I.D. Number
- C. Mass. "Articles of Incorporation"

II. Papers Normally Drawn up by Lawyer

- A. Minutes of First Meeting of Incorporation
- B. Minutes of First Board of Directors Meeting
- C. Agreement of Association
- D. Corporate By-Laws, Including Reference to Appropriate IRS Taxation Statutes (e.g., Section 1244, Section 1377/ Subchapter "S", etc.)

Note: All documents above are on file at MTE and are available for inspection.

