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NEWPORT BEACH, CALIFORNIA

FIELD SUPPORT ACTIVITY
AEROSPACE MANPOWER TRANSFER
TO SMALL BUSINESS ENTERPRISES

FINAL REPORT FOR PERIOD
APRIL 1972 - SEPTEMBER 1972

Report USI-CS-723
Contract #NASW-2274

serving industry and government

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1.0 INTRODUCTION

In March of 1972, Ultrasystems completed a study funded by the Technology Utilization Office of the National Aeronautics and Space Administration which examined the feasibility of a program designed to assist unemployed aerospace professionals in finding employment within the small business community. The findings of this study generated a level of interest which resulted in the contract, No. NASW-2274, being extended to provide for additional field support and program definition activities.

Support from Ultrasystems was solicited by the Employment Task Force Committee of the Los Angeles Area Chamber of Commerce as well as from individuals closely aligned with the Aerospace Technology Applications Committee (ATAC) of the City of Los Angeles, the California Professional Resources Development Center of the State of California, and the Joint Societies Employment Advisory Committee of the National Society of Professional Engineers. The study results enhanced and supported the opinions of various members of the abovenamed groups. As a result, it was determined that support to these groups should be provided to more fully develop the Civic/Governmental Program that had been proposed as a feasible program in our final report.

This report is an addendum to that study report titled, "Aerospace Manpower Transfer to Small Business Enterprises, Final Report USI-CS-722, Contract Number NASW-2274," and briefly describes the activities undertaken in this field support effort. The specific activities (meetings attended, action items undertaken, correspondence with other similar groups, etc.) have been described in periodic correspondence with the NASA Technology Utilization Office and are summarized in the Appendix of this report.

Section 2.0 of this report reiterates the major findings of the original study and provides a definition of three programs which, as a result of this study and other research into this problem, we believe, offer great potential in providing for better utilization of the nation's technically trained personnel and technology resources. Sections 3.0, 4.0, and 5.0 present the details of these three programs and provide a recommended plan of action for their implementation.

2.0 STUDY FINDINGS AND RECOMMENDED PROGRAMS

The principal objectives of the original study program were as follows:

a. To investigate the feasibility of a program to transfer and apply aerospace technology among small businesses.

b. To identify small businesses which need or are in a position to utilize aerospace technology and those corresponding ex-aerospace professionals whose expertise meets those requirements.

c. To develop a program methodology for matching ex-aerospace professionals and small businesses according to their mutual needs.

This study was carried out within those areas of critical aerospace unemployment in the State of California. These areas were the counties of San Diego, Orange, Los Angeles, and Santa Clara.

Hundreds of in-depth interviews with unemployed aerospace professionals, members of organizations providing employment assistance to unemployed aerospace professionals, and small businessmen were compiled and analyzed. For continuity, the principal findings resulting from this study are outlined below:

a. Nearly all present ongoing employment assistance effort is oriented toward the location of jobs rather than the creation of jobs.

b. The small business community clearly represents a potential source of employment for ex-aerospace professionals, and the identification of job openings within this community requires unusual effort and skill.

c. A positive and receptive attitude prevails within the small business community toward the aerospace professional and the skills represented.

d. For long-term success, a program for the placement or transfer of the ex-aerospace professional within the small company should be accompanied with careful counseling, training, and indoctrination.

e. The volunteer and self-help organizations, such as "Experience Unlimited" and "Forty Plus," in conjunction with the Engineers, Scientists, and Technicians Program (EST Program), have allowed the Public Employment Service to develop certain counseling and registration capability for the professional-level job seeker.

f. Existing Department of Labor facilities, through the State-operated Employment Services, can be used to form a basic organizational structure for providing the necessary counseling, training, and indoctrination portion of a job search and matching program involving small business and the ex-aerospace professionals.

g. There is a pattern of attitudes on the part of the ex-aerospace professional of doubt and skepticism in undertaking a significant career change and functioning successfully in a small business environment where products or services are totally unrelated to the professional's past experience.

h. A significant group (10 to 15 percent) of long-term unemployed ex-aerospace professionals exists which will require re-employment assistance beyond that provided by either existing or proposed programs, agencies, or other assisting organizations. These individuals appear to lack the skills, capability, attitude, or motivation to find gainful re-employment in a competitive job market.

i. Technology transfer is largely effected through the migration of aerospace people into the public sector business community.

In summary, these findings support the conclusion that the small business community is favorably inclined toward the ex-aerospace professional as a potential employee, and, though job development within that community requires unusual effort, it represents a generally unexploited job market for displaced scientists and engineers.

The study developed two basic methodologies for gaining entry into the potential resource of jobs in the small business community. One methodology involved the matching of ex-aerospace professionals and small companies in accordance with their mutual needs. Inherent in this methodology was a training and indoctrination program aimed

at familiarizing the ex-aerospace professional with the small company environment and providing him with the basic business orientation necessary for successful employment in this environment. Further, a program of follow-up counseling was defined, which would greatly assist both the small business manager and ex-aerospace professional in satisfactorily achieving the mutual understanding necessary for a long-term relationship.

The second methodology incorporated efforts to inform and arouse interest among the non-aerosapce business community toward participation in affirmative action programs that would serve the mutual self-interests of the individuals, companies, and communities involved. This program would bring to bear the resources of the Technology Utilization effort and those organizations, both public and private, which can best serve this activity.

During this field support effort, it became clear that these two methodologies were not the only programs which would work toward the more effective utilization of aerospace professionals by small business enterprises. This can best be illustrated by referring to Figure 1. At the top of this figure is a box entitled the Technology Innovation Stockpile. This stockpile consists, to a great extent, of a reservoir of technically trained personnel and a bank of inventions and processes that are the result of federal government research and development programs. As has been concluded in the study, the small business community represents a generally unexploited job market for displaced scientists and engineers and the technologies that they have developed. For our purposes, this community is made up of existing companies as well as startup business situations. The flow of technology to these companies is comprised of two elements, the ideas and the trained people necessary to convert the ideas to a marketable commodity that will satisfy the needs of the user community. To facilitate a better "transfer" of technology to the users, each of these flow paths should be examined to determine obstacles that presently impede this flow. It is by maximizing these flows that the small business community can generate the technical jobs necessary to help solve this unemployed aerospace manpower problem.

The methodologies that were developed as a part of our original effort and have been discussed earlier have centered on increasing the flow of trained personnel and ideas into improving the products and services of existing small businesses. Through our field activities, we have become convinced that there is substantial evidence to support the premise that job location and transfer/placement cannot, per se, be efficiently improved over existing levels of achievement.

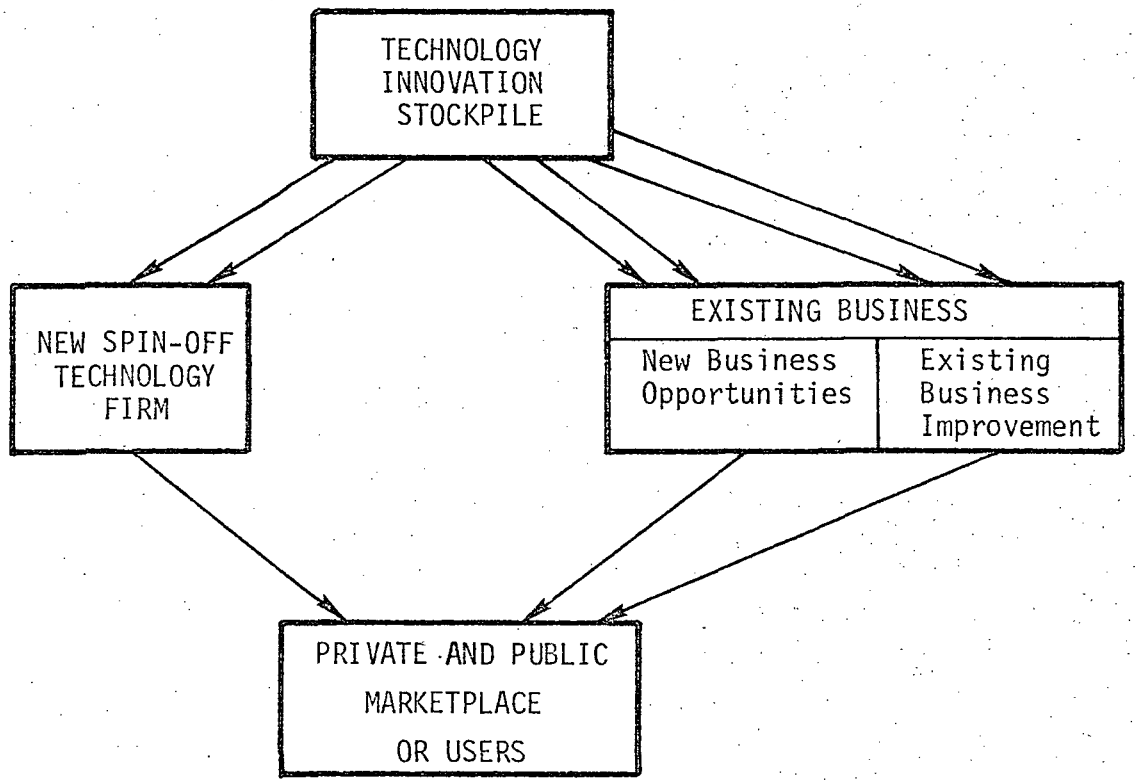

Figure 1. Paths of Technology to the Marketplace

This conclusion is based to a great extent on an extensive data base that Ultrasystems has assembled over the last three months while evaluating, for the Department of Labor, the Labor Inventory Control System (LINCS) operated under the California Department of Human Resources Development. The LINCS system was designed to automatically match professional applicants with available job orders. Upon examination, the ratio of jobs needed to jobs offered, estimated at 15 to 1, is so large as to preclude any real need for employers to hire from another skill or experience area. In other words, the transfer of technology through the migration of personnel from aerospace to some other field is almost impossible because an insufficient number of jobs has been identified by employers. Based on this data, we have concluded that new governmental efforts to solve the unemployed aerospace manpower problem should center on economic development programs to create jobs which will create a demand for the technically trained professionals. The best tool at hand around which to center this economic development effort is the stockpile of technological inventions and processes that have been identified in the country's military and space R & D programs.

The three programs we recommend for implementation all center on this economic development theme. Section 3.0 addresses a program which will facilitate the transfer of ideas for new business opportunities into existing small businesses that are in need of proprietary products and have financial resources. In particular, we feel this program has great applicability to the young minority manufacturing firms which are being sponsored under the 8(a) Federal Procurement Program by the Small Business Administration.

The second economic development program, described in section 4.0, is basically a communication program between government and the businessman, which provides the information and stimulus to the businessman which will encourage him to make an investment that he ordinarily would not make.

The last program, identified in section 5.0, is based on solving a problem known to exist in small technology businesses; that problem is inadequate marketing skills. Referring again to Figure 1, it should be noted that the programs suggested thus far in this report have centered on "catalytic" efforts to identify marketable ideas and match them with the right small business firms. This program addresses the flow of products and services from the firms to the ultimate user. A program has been proposed which will provide the small technical entrepreneur with technical assistance in the marketing function, thus maximizing his growth and job creation potential. In areas of high unemployment, this assistance could be provided under Section 406 of the Economic Opportunity Act.

It is clear that the "transfer" of technology and the utilization of the ex-aerospace professional in non-aerospace industry are closely aligned and must occur simultaneously. This process can only be enhanced through stimulus to the economy, in order to create the need for highly trained and skilled personnel, and education of the non-aerospace business community in the many resources available to them. Thus, it is recommended that these and other programs of contact with the non-aerospace businessman, mutual education and exposure of the businessman and ex-aerospace professional, and economic encouragement through use of technology and other resources be given utmost priority and consideration by all interested agencies.

3.0 TECHNOLOGY TRANSFER THROUGH PRODUCT EXPANSION

An attractive approach to technology transfer and utilization into and by the private sector has developed from some of the study findings and the multiple discussions with industry, government, and interested individuals. This approach involves making available specific and carefully selected processes and products stemming from aerospace goals to a similarly selected group of interested companies or investment ventures for final development and introduction into the commercial or consumer market.

Study findings critical to and supportive of this approach include:

a. One-third of the companies contacted have a very positive attitude toward aerospace people and technology in general, and this same group of firms indicated increasing sales and a generally strong eocnomic posture for their firms. Consequently, they have idle financial reserves, either liquid or in the form of borrowing ability.

b. There is a pattern of attitudes on the part of the ex-aerospace professional of doubt and skepticism in undertaking a significant career change and functioning successfully in a small business environment where products or services are totally unrelated to the professional's past experience. This reluctance seems based on the feelings that a significant investment in education and experience might not be optimally exploited and that the same expertise and capability is sorely needed by society and soon will again be sought. Thus, the job opportunities of most interest to them are technically oriented and have elements of positive contribution to society.

A logical conclusion from the above is that a true and lasting solution to the ex-aerospace professional's dilemma is best accomplished by some means other than a drastic career change. It is also probable that the creation of new job opportunities similar to those found in the technically oriented enterprise from which the ex-aerospace professional emerged provides the best permanent answer to the problem. With this in mind, certain of the activity on the "Manpower Transfer" program has been oriented toward developing such a potential solution.

The creation of new job opportunities, whether in technical or nontechnical business, is a complex and multifaceted problem. However, if many existing businesses are in a growing and profitable economic mode, it follows that many have financial resources in reserve. Drawing these resources into business expansion can represent one method of job development. Examples of this are the outstanding growths that have occurred in industries such as the computer peripherals, medical electronics, plastic, and solid-state circuitry. Well-conceived product ideas in these industries have not lacked financial support.

Convincing those businesses and individuals with idle financial reserves or borrowing ability to invest in technically oriented business expansion can not only serve to create job opportunities of interest to the ex-aerospace professional but, in time, can result in employment opportunities at all skill levels. The product and technology application potential within the body of NASA-sponsored research offers very interesting possibilities toward this end.

Application of aerospace technology to solution of public sector problems results from private investment as well as governmentally supported programs. Privately financed growth industries, as mentioned above, have all benefited significantly from technical efforts from the aerospace programs. While self-interest motivations of private finance inhibit its support for public sector needs, there are clear contributions to improved living standards from the products and services offered by organizations founded with a purely commercial incentive. Also obvious is the further stimulus to the general economy from the generation of new private capital investment. Within this framework of thought lies a most illustrious opportunity for contribution by the technology utilization effort to today's societal needs.

As many potential entrepreneurs will attest, garnering the support of private capital is a most difficult task. However, once such support is gained, the relative freedom with which private capital may be applied toward a particular achievement can result in very swift, direct, and efficient accomplishment.

Several pertinent circumstances are, therefore, evident. A body of underemployed or unemployed ex-aerospace professionals exists who seek opportunity to again practice their profession. Private financial resources are available which are being withheld from all but the most conservative investment entitites. The general economy and existing unemployment levels indicate the need for additional economic stimulus. Many public and private sector needs

exist which lend themselves to solution through the application of existing technologies. These facts combine to indicate that gaining additional private capital support toward the solution to certain of these needs is timely and worthy of additional address.

Many products and services resulting from aerospace technology have found, and will continue to find, their way naturally into the commercial marketplace. Most of these products and services have been the result of ex-aerospace people turning entrepreneur and commercially exploiting their particular technical expertise. Conversely, many valuable, significant, and commercially viable applications of technology lie dormant for lack of sponsorship by a technically oriented entreprenuer. For this group of technology applications, additional effort must be applied.

Gaining support of private capital is difficult, but basically a simple process. The clear demonstration of an "interesting" return on the investment is essentially the sole requirement. It is with the "clear demonstration" that the complexity begins. Many private capital resources are held by decidedly nontechnical individuals. On rare occasions, this may prove advantageous. Generally, however, this requires a very carefully researched and presented business proposal to win financial support. The marketing, financial, and technical research necessary for the business proposal must be followed by the presentation of this data and the organization and use of the resources, once gained. A successful business enterprise based on the application of technology will not only require financial support, but may also present unique manpower, facility, and equipment requirements. Hence, the technically oriented business enterprise not only contains the full gamut of problems and pitfalls of all business ventures, but may very well have these multiplied and augmented by the technical aspects of the product or service offered.

The 1970 Annual Report by the "Project for the Analysis of Technology Transfer" (PATT) describes technology transfer as occurring in four stages.[1] These stages are defined as recognition of opportunity, laboratory verification, prototype development and use, and diffusion of the technology into the market. The first stage, recognition of opportunity, presents the most difficult of the four

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[1] PATT, *Project for the Analysis of Technology Transfer, Annual Report 1970* (Denver: Denver Research Institute, University of Denver), p. 10.

stages in a successful technology transfer. Recognition arising from awareness of a public sector need that might be satisfied via a technology application or vice versa involves many questions that must be answered satisfactorily. Before the recognition stage is complete, both the need, or market, for the technology must be defined and all the requirements for meeting that need outlined. Many apparently viable and worthy transfers have not reached fruition because of the difficulty of outlining the "requirements" half of this first transfer stage. For example, a particular product idea that appears to have a corresponding public sector need requires an analysis of the extent of the need (market survey and sales forecast), an authoritative prediction of additional development and tooling requirements, a definition of manufacturing processes, an outline of the sales and distribution methods, and a reasonably complete prediction of the financial aspects of the activity. Completing this "business plan" to a satisfactory degree requires an uncommon combination of dedication, business acumen, and technical capability. However, it is only after this full "recognition" stage is complete that the transfer can really begin. While the following three stages of the transfer process are by no means simple, with proper completion of stage one they are conventional and more defined organizational functions.

The following outlines a program to enhance the transfer of technology through encouragement of the investment of private capital resources. This program would entail the following activity:

a. The selection of a broad list of NASA technology applications that potentially hold commercial value and also represent the solution to significant public and private sector needs. Selection of these applications should be concentrated toward these promising areas: biomedical, transportation, criminology, and law enforcement.

   The initial list of applications would be selected from the NASA Tech Brief publications, findings of NASA aerospace reports, the various abstract journals, conference proceedings, the NASA patent list, and other special NASA publications. Additionally, the selection should be made with close coordination, assistance, and recommendations of the cognizant Technical Application Teams.

b. An initial screening investigation of the potential commercial value of the technical applications selected should be performed. This investigation would entail a preliminary evaluation of market, cost of producing the product or service, level of initial investment required, and potential return on the investment.

c. The list of applications should then be reduced to "primary" applications which demonstrate the most promise, based on the criteria of potential commercial attractiveness and significance of the public sector need which would be satisfied.

d. For those primary applications selected, deeper investigation should be performed relative to the various commercial aspects of the applications, i.e., public sector market, production costs, sales methods, special equipment and manpower requirements, and capital investment necessary.

e. A business proposal (prospectus) would then be prepared for each of the primary applications, using the above-described data, which would clearly delineate the product or service represented and present the complete financial and organizational requirements. A forecast of sales, costs, and cash flow would be prepared, demonstrating the capital requirements and expected return on investment.

f. Qualification criteria for the selected investor group should be developed encompassing at least market familiarity, technical competence, degree to which existing organization may be used, past performance record, and other possible aspects such as ethnic minority ownership, distressed area location, etc.

The above-described catalytic activity would result in the commercial introduction of valuable products and services, resulting from technical applications that are not now available.

4.0 JOB CREATION THROUGH ECONOMIC DEVELOPMENT

Many studies, training programs, professional and volunteer job search endeavors, and Federal Government-sponsored subsidy-type programs have been instituted to assist in this attempt to transfer people from one industry to another. Through our field activities, we have become convinced that there is substantial evidence to support the premise that job location and transfer/placement cannot, per se, be efficiently improved over existing levels of achievement.

As a consequence of the apparent existence of optimum performance level of transfer/placement operations, while manpower pools of unemployed or underemployed people at all skill levels continue to exist, it becomes clear that additional effort is necessary. Consideration of all factors indicates that the only effective and lasting solution must be in the creation of jobs which do not now exist. Thus, an economic development effort is dictated.

Recent studies show that approximately 30 percent of the business firms within the State of California experienced increasing sales and profits during calendar year 1971 as compared to 1970. Another 20 to 30 percent of the business firms have remained at least static with respect to 1970 performance. In spite of this, there continues to be a large group of unemployed and underemployed professional level personnel within the state. While there are some economic development programs under way, none of these ongoing efforts is taking full advantage of the unique circumstance of the existence of this highly trained manpower pool, together with business firms which, if properly encouraged, could make use of this group.

An additional finding of these recent studies indicates that few businessmen are aware of the resources available to them. Principal among these resources is the vast pool of technology that has resulted from the various government programs. Also, besides the manpower pool and technology, many services are offered by various government agencies which could greatly assist the businessman. The Department of Commerce, the Small Business Administration, the National Bureau of Standards, and many state and local agencies are only a few of the many sources of assistance available.

Thus, a program of direct contact with the businessman by persons knowledgeable in the resources available is needed. Such direct contact will serve to inform the businessman as well as encourage the use of these resources. Such a program will contain the following basic tenets and activities:

a. An elite group of "Transfer Agents," informed as to the various resources available to the businessman, and selected for their communicative abilities, will be organized for performing the direct contact to businessmen.

b. Firms will be selected for contact using available company listings and information (Chamber of Commerce publications, Industrial Registers, Dun & Bradstreet, etc.).

c. Using modified sales techniques, the "Transfer Agents" will contact the managers of the selected firms and personally visit those representing good prospects for "economic encouragement."

d. The resources available, and applicable, to the particular businessman will be explained and the "Transfer Agent" will offer assistance to the businessman toward using such resources. The businessman will be encouraged to use one or more of the resources available and make an investment that he would not ordinarily make at the time of the "Transfer Agent" visit, or perhaps would not make at all. Such an investment could vary from no more than a small property improvement (painting the building, for example) to an elaborate new product development or improvement program using the resources of the body of technology available.

e. Those investments of private capital generated by the "Transfer Agent" will be compiled and serve as a direct measure of the efficacy of the program and the respective "Transfer Agent."

It is anticipated that, with careful selection of the Transfer Agent personnel, no more than a two-week indoctrination and workshop training program will be required.

It is expected that each Transfer Agent will generate a minimum of $1M in private capital investment per year that would not ordinarily be made. This will translate to the creation by each agent a minimum of between 20 and 40 jobs that do not now exist.

5.0 MAXIMIZATION OF THE JOB CREATION POTENTIAL OF TECHNOLOGY SPIN-OFF FIRMS

Earlier in the report, it was mentioned that most products and services resulting from aerospace technology have found their way into the marketplace through ex-aerospace people turning entrepreneur and commercially exploiting their particular expertise. A look at these "spin-off" businesses is rather key to any planning to re-employ aerospace manpower, because the successful growth of these firms will create new technical job opportunities which we have previously described as the most effective and lasting solution to this manpower problem.

These firms have accomplished the difficult task of identifying a transferable technological innovation and matching it with a business enterprise staffed with knowledgeable entrepreneurial talent interested in getting this technology to market. Once these spin-offs have been formed, their successful growth then represents a major potential source of new technical job opportunities, as well as a strong contribution to the economic growth of the country and its position in international trade. Given the importance of these firms, one must ask the question, "Are they maximizing their potential for growth?" and, if not, "What can be done to provide these firms with the right support for maximizing growth?"

Spin-off firms are different from the typical small business. The focus of management on developing new technology means that spin-offs are marked by a strong technical orientation. Typically, the principal founders and most of the initial employees are technically trained. In many instances, formal business experience is not commensurate with technical capability.

One of the most challenging problems encountered by the spin-off firm is marketing its high technology product, service, or capability. Previous research emphasizes that entrepreneurs of spin-off firms have inadequate knowledge and understanding of the role of marketing in business growth and success.

The extent of this problem can be inferred by the following excerpts from research literature in this field:

> ...are often staffed with men who have little or no experience with professional marketing, and who may also be inclined to dislike it, and underrate the necessity of it.[2]

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[2]Albert H. Rubenstein, *Problems of Financing and Managing New Research-Based Enterprises in New England*, p. 90.

> ...an insufficient understanding of the importance of marketing in the overall operation.[3]
>
> Finally, one differentiating element we also note is the existence of a marketing department in the more successful new companies and the lack of formal marketing organizations in the less successful firms. This, in part, is related to one earlier finding pertaining to the general importance of recognizing the need for specific business functions in the corporation. More significant is the likelihood that this factor gives testimony that advanced technology needs to be exploited, and that even brilliant ideas do not move by their own energies into the marketplace.[4]

Specific research into the details of this marketing problem was performed by Lawrence Lamont in his study published in 1971 entitled Technology Transfer, Innovation, and Marketing in Science-Oriented Spin-Off Firms. From his study of 126 Michigan spin-off firms founded in the period 1954 to 1968, he drew the following conclusions:

> During the formation process, entrepreneurs actively sought market information to justify the formation decision. Although information that related to market needs, customers, and competition was obtained, it was always insufficient in retrospect. Entrepreneurs failed to obtain enough market data to accurately describe the nature of the business opportunity.
>
> Most of the firms did not recognize the need for a marketing capability during the formation process and, as a result, were unable to anticipate marketing problems and to develop effective programs. All the spin-offs would have benefited from a careful evaluation of the marketing requirements for the item they planned to sell.

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[3] Bureau of Business and Economic Research, San Diego State College, *A Study of the Problems of Small Electronics Manufacturing Companies in Southern California*, a report prepared for SBA, February, 1962, p. 179.

[4] Edward B. Roberts and Herbert A. Wainer, "Technology Transfer and Entrepreneurial Success," *Proceeding of the 20th National Conference on the Administration of Research* (Denver: Denver Research Institute, 1967), p. 83.

> The research indicates that the marketing program required to market a technical capability is entirely different from the program needed to market a standard product or service. Firms moving across the spectrum of business activities toward a product orientation must recognize that the capabilities required for effective marketing change rapidly. A continuous evaluation and adjustment of the firm's marketing program is required during the early stages of development.[5]

In its annual reports to the Small Business Administration, Ultrasystems has highlighted this inability to sell and take advantage of market potential from the viewpoint of having provided management assistance to over 400 businesses over a three-year period.

> It was extremely rare to find an assigned company that could not effectively produce the goods or services upon which the business was established. It was equally rare to find a company that knew how to effectively sell the goods and services produced. Most of the companies were competitive with the quality and price of their particular product. The lack of sales was generally due to the proprietor(s) being heavily oriented to the 'technical' aspects of the business rather than the marketing. In many cases, the managers were essentially unaware of basic sales techniques and did not possess the ability to perform the salesman's role. It is interesting that many such proprietors were under the impression that they were properly performing the sales function. This ignorance as to what constituted satisfactory performance of the sales function for their particular industry, therefore, led to not only inadequate sales coverage, but inability to recognize the inadequacy.[6]

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[5] Lawrence M. Lamont, *Technology Transfer, Innovation, and Marketing in Science-Oriented Spin-Off Firms,* Industrial Development Division Institute of Science and Technology, The University of Michigan, 1971, p. 118.

[6] John B. Dunzer, "*Final Report on Technical and Management Assistance Provided Under Contract SBA-406-C-018-70,*" Ultrasystems, Inc., a report prepared for SBA, 30 June 1971, pp. 10-11.

It can be concluded that spin-off firms typically lack the marketing skills necessary to fully exploit the potential of their technology. This is a national problem which not only reduces the potential number of new technical jobs provided for the technically trained but also inhibits contributions to the long-term economic strength of our country.

This problem can be attacked by government and business in a similar yet more effective manner than today's minority entrepreneur problem. Certainly the federal government is working towards the establishment of a national policy to better utilize the technical manpower resources of the country with such programs as are established by the National Science Policy and Priorities Act recently passed by the Senate. What would seem to be a reasonable first step toward providing actual programs offering in-the-field marketing assistance to spin-off firms would be a project as authorized under provisions of Section 406 of the Economic Opportunity Act of 1964. This act, as amended, permits federally funded technical and management assistance to be provided to individuals and enterprises eligible for assistance under Section 402 of said Act, with special attention to small business concerns located in urban or rural areas of a high concentration of unemployed, as well as others.

The proposed new program for spin-off firms under this authorization, would offer assistance to them in evaluating and exploiting the market for their technology. It differs from other existing or proposed programs in "technology transfer" in that assistance is provided after the match of ideas and technology and the commercial organization has taken place. It does not replace existing "transfer" programs; it completes the delivery cycle by providing assistance in transferring technology up to that point where normal marketing channels can successfully and profitably deliver technology to the user.

In designating firms that would be given assistance and identifying the types of assistance to be provided, certain guidelines should be followed. Suggested guidelines for company participation follow:

- The company's technology should be in high growth areas where the opportunity for the generation of technical jobs and foreign trade are the greatest.

- The company should be a small business.

- The company's participation must be voluntary but should involve a financial commitment by the company to repay part of the costs of such assistance out of future profits. This might be accomplished much as the low-cost student loan program is handled, with money guaranteed by the government but put up by private sources. The basic initial process would involve the generation of a work plan by a consulting agency selected by the firm from qualified sources such as professional societies, local economic development agencies, trade associations, and professional marketing consultants and firms. This plan and a report submitted by the marketing consultant would be the key to authorization of the disbursement of the loan.

- The firm should be located in an area of high unemployment of technically trained individuals as designated by the Department of Labor.

Typically, assistance services would be those that are not normally procured or affordable by the company at its present state of operations and development nor those that are a part of normal marketing channels. They would mainly involve market planning and research as necessary to determine the product configuration that can be sold, the price structure that it can be sold at, the distribution channels or place that will expose it to the buyer in its best light, and the promotion and advertising program necessary to gain buyer interest.

This program has been designed keeping in mind that a reasonable role must be proposed for Federal Government involvement. Actual services to the companies will be provided by existing qualified organizations so the Federal Government will not have to create a major organization to provide these services. Firms will not have to participate in this program under a governmental decree. These firms will basically be free to choose the organization which will provide them with this assistance, and will become active participants because they will be financially involved in paying for a portion of these services on a decreed basis. The organizations who deliver these services will provide the communication link to the small high-technology businessman because it is now in their interest to do so. This program provides them a method to broaden their market to a group of customers who previously have not had the resources nor the incentive to participate in professional market planning. In addition, the program can be demonstrated and evaluated on a limited basis before the Government is committed to a larger national effort.

In summary, the proposed program is characterized by the following:

- Concentrates on a known problem
- Has existing organizations capable of providing services needed
- Government role limited to providing incentive through guaranteed fees that will be repaid
- Utilizes existing legislation and programs to attack this problem
- Program is voluntary and enables small businessman to select his source of assistance from those qualified
- Capable of being demonstrated and evaluated on a total basis
- Accomplishes national objectives by the better realization of existing national resources through Government incentives

Ultrasystems has reviewed this entire program with several potential user clients who meet the outlined qualifications, as well as members of existing marketing organizations involved in high technology products. Without exception, each was aware of the problems that have been outlined earlier in this section. As a group, they felt that a program such as the one described would gain considerable acceptance from the small business community, would help solve problems which otherwise would not be addressed by management in a timely or knowledgeable fashion, and would result in accelerated growth and technical job creation for the small technology oriented firm.

APPENDIX

REPORT SUMMARIES

The following are summaries of periodic reports submitted by Ultrasystems to the Director of Technology Utilization, Mr. Jeffrey T. Hamilton. The dates provided refer to the date of submission of the original report correspondence.

March 7, 1972

Attended a meeting last Friday (March 3, 1972) of the Employment Task Force Committee for the Los Angeles Area Chambers of Commerce. We were invited to attend by the Chairman, Admiral C. F. Horne. The Co-chairman of the Committee is Mr. Kaye R. Kiddoo, who is Corporate Personnel Director for Lockheed Aircraft.

The purpose of this Task Force Committee is to attempt to find effective methods of improving the general Los Angeles area economy and, thereby reduce unemployment. The area of interest to this committee is the five Southern California counties, with the exception of San Diego County. These counties include San Bernardino, Ventura, Orange, Riverside, and, of course, Los Angeles County.

The meeting was attended by some twenty to thirty local businessmen, most of them vice-presidents or presidents of their respective firms. Also, three members of the Board of Directors of the Area Chamber of Commerce were in attendance.

This meeting was the second scheduled meeting of this particular Task Force. Several subcommittees had been formed: a Program Development Committee, a Communications Committee, and a Fact-finding Committee comprised the three subgroups, and each was asked to report on certain action items.

The main topic of discussion during the meeting was an attempt to define an effective program that would be at the same time realistic and worthwhile. One of the attendees, Mr. Samuel Lynch, who is also on Mayor Sam Yorty's ATAC Committee, suggested to Admiral Horne that Ultrasystems present the results of their recent findings and ideas toward this problem solution. Admiral Horne stated that he had invited me specifically for that purpose and then allowed me a few minutes of presentation time. The response to our findings and our ideas was very positive and Admiral Horne requested my participation in the Task Force efforts in the future. He requested that copies of our forthcoming report be made available to all members.

I further committed to meet with Admiral Horne at his General/Dynamics office early next week to discuss our possible mutual assistance. The Chamber of Commerce Task Force Committee effort is aimed at unemployment in general, however, Admiral Horne felt that the Committee should concentrate its efforts in the professional category, since, in most businesses, the less skilled jobs follow the addition of the professionals. The Committee generally agreed with this and, hence, their strong interest in our findings and further participation. Additionally, Admiral Horne is to attend very shortly a meeting of the Board of Directors of the California State Chambers of Commerce. He intends at this meeting to obtain the support of this organization for Lt. Governor Ed Reinecke's Task Force Commission and would like support in this effort also. The Lt. Governor's Commission is specifically oriented to providing assistance to the ex-aerospace unemployed.

April 3, 1973

I met last week with Admiral Horne and discussed the basic tenets of our program insofar as it related to his activities. As a result of these discussions, we arrived at several specific action items which I am now undertaking. Principal among these are the support to his Chamber of Commerce subcommittee for program definition and the preparation of a presentation of our manpower study report to Lt. Governor Reinecke and his Commission on aerospace unemployment. Admiral Horne feels that he can arrange this as well as several other presentations to interested industry groups, etc.

I have also been in contact with Mr. Kaye Kiddoo, who is subchairman of Admiral Horne's Committee, as well as heavily involved in Mayor Yorty's ATAC group. Mr. Kiddoo is going to work very closely with me in preparing more detailed presentations along the lines of the programs presented in Chapters 7 and 8 of our final report.

In addition, I have come in contact with the California Professional Resources Development Center, which is a group in Sacramento reporting to Lt. Governor Ed Reinecke and is part of his Industry Commission on Re-employment of California Engineers and Scientists. This group has been funded by the Department of Labor for the remainder of this calendar year to assist Reinecke's Commission and attempt to perform some of the same type of work that we are presently undertaking. I will be working closely with them, in addition to the other groups with which I have come in contact. I am certain that one of the functions that can be performed during the immediate future is to act as liaison between these various organizations and prevent a certain amount of effort duplication.

April 13, 1972

We have been continuing our work with the Los Angeles Area Chamber of Commerce Committee and laying the groundwork for additional activity in Sacramento. I am presently reviewing and rewriting the drafts on three proposed programs. One was prepared by Mr. Cox of the Department of Commerce originally for Governor Ogilvie of Illinois and the other two are local programs. These proposals will be presented to the appropriate agencies by Mayor Yorty's ATAC Committee or the Chamber of Commerce Committee. I have enclosed copies of these rough drafts.

At the suggestion of Admiral Horne, I have submitted copies of our final report as well as our proposed economic development program to a list of various public officials here in California. This list also includes Lt. Governor Ed Reinecke, who Admiral Horne feels will be interested in hearing more details of our study effort and some of our present activities. We hope to make a presentation to him and/or his staff in the near future.

I have been in contact with several members of the California Professional Resources Development Center, which is a special group in Sacramento funded by the Department of Labor. The primary purpose of this group is to support Lt. Governor Reinecke's Industry Commission on Re-employment of California Engineers and Scientists as well as be generally concerned with the problem of unemployed professionals within the state. I am tentatively planning to make a presentation before this group within the very near future. This will probably lead to certain activities in support of their efforts. Since much of their effort is concentrated toward devising methods of transferring professional manpower into other nonaerospace areas, there is a very close relationship with our interests. This group has been funded through the remainder of this calendar year. Consequently, their support toward technology utilization and manpower transfer should result in some significant progress.

Another meeting of the Employment Task Force of the Los Angeles Area Chamber of Commerce is scheduled for this coming Monday, the 17th. I will present at this meeting a redraft of the three proposals mentioned above.

May 9, 1972

We were able to obtain last week the approval by the Los Angeles City Council for a small budget to support five full-time ex-aerospace professionals and two secretaries to assist in the

writing of a proposal document. This budget was approved to support this team for several months and will give Mayor Yorty's Aerospace Technology Application Committee and the Chamber of Commerce Employment Task Force a full-time working staff to develop our program. We have interviewed seven ex-aerospace professionals for these positions and the City Personnel Department will interview them and narrow this to the five available positions. Working space for their activities will also be provided at City Hall. We expect this team to be selected and working by Tuesday or Wednesday of this coming week. Incidentally, Kaye Kiddoo is now Chairman of Mayor Yorty's ATAC group.

The funds for supporting this group are actually coming from Emergency Employment Act appropriations that the City Council has diverted. One of the most important considerations on the part of the City Council in approving this budget was the fact that the Office of Technology Utilization is supporting this effort through our contract. This display of support on the part of NASA has been very encouraging to not only the city officials, but also to the volunteer businessmen who are contributing their efforts on these two committees.

In line with obtaining additional support for our program efforts, I visited Sacramento and San Francisco during this past week. I obtained a meeting with Lt. Governor Reinecke in which I described our efforts and the fact that the Office of Technology Utilization was supporting much of this activity. He was very interested in this and has committed his personal support as well as that of his office toward our program efforts. I also obtained audiences with Mr. Sigurd Hansen, Director of the California Employment Services; Mr. John K. Geoghegan, who is the newly appointed Executive Director on Ed Reinecke's Commission for Economic Development; Mr. Donald Balcer, Deputy Regional Manpower Administrator for the Department of Labor; Mr. Gilbert Montano, Regional Director for the Small Business Administration; and a number of other officials on the staffs of these people. I also met with a special group called the California Manpower Resources Development Center. This group is supported by Department of Labor funds and is chartered to support Lt. Governor Reinecke's Commission on Re-employment of California Engineers and Scientists. We will be working very closely with this organization in developing our program.

During my visit with Lt. Governor Reinecke, he invited me to attend the opening session of his Commission for Economic Development, which was held Friday morning in Los Angeles. I accepted his invitation and found this commission meeting quite interesting and certainly in line with some of our interests. The aerospace industry

is represented on this commission by Mr. Jack K. Vollbrecht, President of Aerojet-General Corporation. I had the opportunity to meet with Mr. Vollbrecht for a few moments following the commission meeting and described to him our technology utilization activities. He seemed quite interested in our efforts and pledged his support wherever possible.

Mr. Joseph Berke from SRI accompanied me during my visit with the California Manpower Resources Development Center and also during my visit to Lt. Governor Reinecke. Some of his efforts are very much in line with this overall effort and his support will undoubtedly be most welcome and helpful.

The proposal that we are putting together through the joint efforts of the Chamber of Commerce Task Force and Mayor Yorty's committee is going to be aimed principally at the Department of Commerce. Our program will stress the use of the resources of ex-aerospace professional manpower and the body of technology available through the efforts of your office. We feel that such a program can serve the best interests of all concerned by using the aerospace manpower to conduct the effort and furthering the cause of technology utilization.

June 8, 1972

Following my visit to the Office of Technology Utilization on Wednesday morning (May 31, 1972), I met later with Dr. M. Frank Hersman as planned and found some of his program efforts very interesting and generally in line with our ideas. Dr. Hersman had me discuss his department's activities further with his program manager, Mr. Harold Metcalf. Mr. Metcalf spent considerable time with me and reviewed the many programs with which they are involved.

I also had a short visit with a Mr. Scott Rutherford, who is Staff Assistant to Robert M. Jackson, Chief of the Training Division in the Office of Technical Assistance within the Department of Commerce. Mr. Rutherford explained the function of their offices and described some of their areas of interst. He suggested that I return and discuss our program with Mr. Jackson.

I met also on Wednesday with Mr. James F. Kelly in the Department of Labor. Mr. Kelly is Special Assistant to the Chief of the Division of Placement, Office of Technical Support, U. S. Training and Employment Service. I discussed our program with Mr. Kelly. Mr. Kelly expressed great interest with the basic tenets of our program.

I met the following day with Mr. Jackson and discussed our program with him in detail. He has a similar program underway in Illinois which he started with an initial $100,000 grant to the governor. This program is essentially a technology transfer effort in support of technical development of Illinois commerce. The Governor of Illinois has additionally allotted 20 jobs to this program, which will be supported from Department of Labor Emergency Employment Act funds. Mr. Jackson stated that he had an interest in placing a similar grant within the State of California and several other possible states during the upcoming fiscal year. He did declare, however, that the budget allocations were not firm as yet and, therefore, it is entirely possible that he may not have the money available. Nevertheless, his interest in such a program is high.

I visited a Mr. Arthur B. Carroll in Illinois. Mr. Carroll is the Director of the Illinois Department of Commerce Program and works directly for Governor Ogilvie in managing this effort. Mr. Carroll was receptive to some of our thoughts and ideas relative to the problem of approaching businessmen and transferring technology. He was particularly interested in the results of our survey and has requested several copies of our report for use by his staff. He also was very receptive to the idea of us working in conjunction with him and perhaps assisting him in the initial stages of the program in order to better define our California effort and enhance the success probability of his own project. He also agreed to assist us in any way he could to gain the support necessary to work with him during this initial startup phase.

I attended the Los Angeles Area Chamber of Commerce Committee meeting and presented the results of my trip. It was agreed, at this point, to utilize the remaining contract resources in providing, over the next 3 months, limited support and liaison to the various governmental agencies in their economic development proposal efforts.

Members of the Ultrasystems' staff have attended the monthly ATAC meetings, the last of which was held on September 11. During this three-month period, several major changes have taken place in the direction of this group. The charter of this group has been modified to reflect its new name; The Technology Advisory Committee of the Mayor's Office, City of Los Angeles. Their charter now is to develop the use of technology throughout the departments of municipal government. Funds have been provided by the city and a proposal to the National Science Foundation for long-term funding has been submitted.

The Ultrasystems' staff has also continued to work with the unemployment task subcommittee of the Los Angeles Area Chamber of Commerce. The Civic/Governmental program outlined in this report is being sponsored by this group, and a statewide program has been proposed to the Department of Commerce for its funding.