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DRA

InterAmerica

RESEARCH ASSOCIATES

FINAL REPORT

Volume I

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Technology Utilization Conference Series

Contract #NASW 2761





MAIN OFFICE: WASHINGTON, D. C.
FIELD OFFICES: SAN ANTONIO, TEXAS
FRESNO, CALIFORNIA
LAWRENCE, KANSAS

December 19, 1975

NASA Scientific and Technical
Information Facility
P.O. Box 33
College Park, Maryland 20740

Sirs:

InterAmerica Research Associates is pleased to submit its Final Report on the "NASA Technology Utilization Conference Series" in compliance with and in completion of Contract #NASW 2761.

Wishing your staff a happy holiday season, I remain,

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Juan S. Guierrez".

Juan S. Guierrez
President

Enclosures

FINAL REPORT

VOL. I

Contract #NASW 2761

Technology Utilization Conference Series

Submitted To:

NASA Scientific and Technical Information Facility
College Park, Maryland

NASA Headquarters - New Technology Representative
Washington, D.C.

NASA Headquarters - Office of Equal Opportunity Programs
Washington, D.C.

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TABLE OF CONTENTS

I. PREFACE	1
II. INTRODUCTION	3
III. DESIGN	7
IV. CONFERENCE ASSESSMENT AND COMPARISON	15
V. EVALUATION	31
VI. RECOMMENDATIONS AND CONCLUSIONS	39

Charts and Tables

Table 1	Overview of Statistics Related to Minority Business Attendance	18
Table 2	Numbers and Percentages of Invitees, Confirmations, and Attendees per Site	19
Table 3	Numbers and Percentages of Sales Volume	24
Chart 1	Comparison of Invitation, Confirmation, and Attendance Statistics	21
Chart 2	Comparison of Numbers and Percentages of Sales Volume by Site	25
Chart 3	Comparison of Numbers and Percentages of Attendees to Searches	28
Chart 4	Search and Follow-Up Decision Tree	36

TABLE OF CONTENTS

I. PREFACE	1
II. INTRODUCTION	3
III. DESIGN	7
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I. PREFACE

The report which follows is a study and evaluation of the design, development, and results of a series of six technology utilization conferences co-sponsored by the National Aeronautics and Space Administration (NASA) and the Department of Commerce, Office of Minority Business Enterprise (OMBE). The conference series, which was managed and administered by InterAmerica Research Associates, represents the development of a viable and successful means of encouraging the transfer of technology to the minority business community.

Volume I of the report consists of the following sections:

- ° Introduction - outlines the purposes and goals of the conference series.
- ° Design - details and highlights the development of successful means of attaining the expressed goals.
- ° Conference Assessment and Comparison - describes and evaluates the results of the conferences in terms of the statistics which have been compiled.
- ° Evaluation of the Seminars

- Recommendations and Conclusions - future courses of action based on the experiences gained in this series.

Volume II of the report consists of appendices which include:

- A complete report on each conference detailing preparations, proceedings, and evaluation for each site.
- The invitation packages used for each conference.
- The agendas for each conference.
- Listing of NASA/OMBE hand-out materials.
- Listing of mailing lists and organizations screened for recruitment of minority businesses.

InterAmerica, in designing and implementing this conference series, discovered numerous facets of the minority technical business community and determined the best possible approach to encourage technology utilization. In managing and administering the series, a number of areas for future study were unearthed. This report intends to explain and elucidate the successful methodology developed through past experience and the most effective areas for future research in order to increase the potential for the expansion and growth of technology utilization by the minority business community.

II. INTRODUCTION

"Minority Business Development through Technology Transfer" was the theme of six technology utilization seminars for minority businessmen held throughout the year of 1975 in various regions of the country. The purpose of these conferences was to expose minority businessmen to the data, information, and services available through NASA and NASA funded data banks so that new products, processes, or techniques resulting from NASA's research and development might be transferred to members of the minority business community.

The conferences were the result of an inter-agency agreement between NASA and OMBE working together to accomplish the goal of technology transfer to minority businessmen. NASA would make available to participants all relevant information and services concerning available technology and provide one free search of its data banks for each of the participants, while OMBE would provide supportive services to the minority businessmen by directing them to funding sources and providing other supportive assistance.

The seminar objectives of the contract were stated as follows:

1. To make the minority industrial and educational community participants fully aware of NASA technology which can be developed into marketable products.
2. To transfer suitable technology to appropriate minority industry and education participants and provide

detailed data for continued available technical assistance and support to minority entrepreneurs from NASA's Regional Dissemination Centers and Technology Applications Teams.

3. To provide to minority industrial and educational community participants guidance concerning Government grant and contract opportunities and how they may be obtained, as well as how to evaluate and respond to Government requirements.

InterAmerica managed and administered this series of conferences, working with a Task Force consisting of representatives from NASA's Office of Equal Opportunity, NASA's Technology Utilization Office and the Department of Commerce, Office of Minority Business Enterprise. InterAmerica was constantly in contract with the members of this task force, and most of the policy decisions were made in conjunction with InterAmerica.

The ultimate goal of these seminars was the establishment of a contact point between the massive resources of NASA and NASA's data banks and the needs and interests of the minority business participants. NASA's network of data, information, and services has the potential to be narrowed to a specific point in order to assist a particular minority businessman. The broad category of the minority business community can be narrowed to individual technically oriented businessmen with specific needs and interests which NASA can serve.

InterAmerica's task in managing the conferences was precisely to narrow the two domains so that communication links would

be open and the potential for transfer established. Through the study of NASA's available resources and services to determine those with applicability to the minority business community, and the concurrent screening and recruiting of minority businesses, the contractor narrowed the fields to points of mutual interest. The conferences established the lines of communication between the two fields.

NASA took the initiative by sponsoring the conferences to impart information concerning the opportunities and possibilities of transfer for minority businesses. Through the technical personnel at the conferences, minority businessmen learned of specific technical data sources related to their businesses, and NASA's offer of one free search of its data banks to each participant further specified the information available.

In turn, NASA received information concerning potential uses of its services through the screening process which produced the attendees. Those minority businesses which attended the conference were businesses with informed interest in the possibility of transfer. At the conference, the participants had the opportunity to make their problems, capabilities, and interests known to NASA personnel. The conferences moved the two parties one step closer to the transfer point.

The follow-up to the conferences is the crucial step in determining whether or not transfer occurs. Here, the burden of initiative has passed from NASA to the minority businessmen. If

the minority businessmen takes the initiative, finds relevant information and technical assistance, if needed, and has either the monetary capability or can procure outside funding, then transfer will occur. From the first initiating step onward, there are a number of places where this process may come to a halt, and the reasons for this are many and varied. Hypothesis and questions raised from the findings of these conferences will be explored in the Evaluation and Recommendations and Conclusions Sections.

The process described above outlines the successful accomplishment of the goal of technology transfer to minority businesses. The remaining sections of this report will detail the procedures and results utilized in this conference series to develop and encourage viable transfer methods.

III. DESIGN

The preparational phase of the conferences may be generally overviewed as a process of successive narrowing. Every task involved the delineation of the specific aspects of each field which would be most productive to the conference series. For example, the large field of the minority business community was researched to extract those minority technical firms whose qualifications and interests were applicable to the technology utilization program. The approach to conference audiences was modified as the series progressed to best meet the needs of participants. The range of NASA and OMBE materials and information was studied and evaluated to determine the types of promotional literature and hand-out materials which would be of the best utility and interest to the minority businessmen.

The production of this series of conferences had certain developmental and experiential aspects. Definitive and comprehensive information concerning all aspects of conference production became increasingly clear and complete as the series progressed. As the input of information, both statistical and evaluatory, increased, the conferences were modified and changed.

The basic tasks involved in preparing for the conferences were:

1. Recruitment of minority technical businesses.

2. Drafting of a detailed agenda and contact of agenda participants.
3. Choice and preparation of promotional and hand-out materials.
4. Choice of site.
5. Contact of key local personnel.
6. Preparation and sending of formal invitations.
7. Telephone follow-up and promotional calls.
8. Final preparation of the site for the conference.

The selection, screening, and recruitment of minority technical businesses was the most crucial phase of the pre-conference activity. The procedures developed to best accomplish this task were formalized to provide the most comprehensive listing of potential participants. During the site visit, the conference manager would meet and develop working relationships with as many representatives from local minority oriented organizations as possible. He also met with the Regional OMBE Office personnel and, if possible, representatives from local OMBE funded organizations. Because of limitations of time, those local contacts who could not be encountered personally were contacted by telephone and mail. The conference manager solicited mailing lists and suggestions from the aforementioned organizations and personnel. (For a comprehensive listing of contact organizations and mailing lists, See Volume II.) In addition the conference manager solicited suggestions on possible participants from various technical personnel in the cities. All suggestions and mailing lists were screened by the InterAmerica to determine those minority firms who would be interested and capable of utilizing this program. A

total of 696 minority technically oriented firms received information concerning the program.

The agenda evolved from the originally planned two day conference, to a full one day conference to a relatively short, approximately six hour seminar. This evolution was the result of several factors.

First, it was determined that most small minority businesses are pressured for time. Small staffs and the exigencies of running a small business account for this time pressure. A shorter conference makes attendance more feasible for minority businesses.

Second, it was found through conversation and comments with the participants that effectively they had been "conferenced to death." They were uninterested in most general agency service presentations as they contended that they "had heard it all before." The presence of filler material on the program tended to cause negative reactions to the entire program. The conference manager and the task force strongly felt that this conference series was truly beneficial to the minority businessmen, and that the search service and the technology utilization program had the potential to be valuable tools for participants. Thus, the agenda increasingly focussed on the substance of the program.

Third, the program originally included several of NASA's larger contractors who presented information on their minority procurement policies. These presentations provoked a significant degree of hostility

in participants, as many had attempted to do business with these contractors and failed. It was determined that participants would have a much more positive reaction to the NASA and OMBE services and the opportunities afforded by the Technology Transfer Program if they were not confused and side-tracked by the presence of contractors.

The program which was developed and positively received by participants both in their reactions to the Technology Utilization Program and to the conference itself was short, but concentrated and inclusive. The conferences were viewed by participants as productive and useful working sessions.

Sufficient background information was included to enable participants to understand and utilize the services offered. This orientation included the following elements:

1. Short presentations were given by representative of NASA and OMBE to introduce participants to the program.
2. These presentations were immediately followed by a display of actual products, and slides of actual products, which had been commercially developed through the use of NASA technology.
3. A representative from the local NASA installation's Office of Patent Counsel gave a short presentation and was then available for questions.

The sum total of this portion of the program was one hour.

Participants received necessary and applicable information in a minimal amount of time with few non-essential elements.

The second portion of the program involved an introduction to the Industrial Applications Center Services (IAC) and an explanation

of the types of information and services available. This general overview was followed by workshop sessions moderated by technical personnel from the Industrial Applications Centers. Although the format varied depending upon the specific resources of each IAC, the basic goal of active interplay between participants and moderators was accomplished at all conferences. (For detailed information on evolution of agenda, See Volume II.)

The results of this evolution of the agenda strongly indicate that a short, concentrated, compact and tight program, which stresses the practical workings of the Technology Utilization Program, and is unburdened by any non-essential additions, is the best approach to the minority business community.

Site selections were based on the availability of facilities, the logistical arrangements available, and the price both to sponsors and participants. It was found that hotels were generally the best sites in that they offered excellent logistical arrangements, they were experienced in long distance arrangements, and they implied only neutral connotations to participants. It was also discovered that most available government sites were unable to provide the proper logistical arrangements. Thus, hotel facilities were used as frequently as possible. (See Volume II for further information.)

The production and promotion of the conferences necessitated a search of both NASA and OMBE's informational facilities for applicable materials for distribution to the participants at each

conference. A number of materials were chosen to be handed out, and a packet was designed and formalized. Additional materials were chosen which would be available at every conference, regardless of the specific interests of those in attendance. (See Volume II for listings of these materials.) Each Industrial Applications Center which attended brought information related to their own services, and most provided search request forms so that participants would be encouraged to initiate searches. At each conference, the types of companies who confirmed were analyzed so that Tech Briefs related to these areas could be distributed. The Tech Briefs give participants a good idea of the types of products, processes, or techniques which NASA could provide in their areas of interest. In evaluating the materials at the conferences, participants were generally pleased with the scope and breadth of the presented materials.

The design of promotional materials and the execution of the invitational process was developed through the first several conferences to produce a successful invitational procedure. (See Volume II.) The invitational process which developed and was found to be most productive was a three-phase mail-out. Approximately one month prior to the conference, participants received a promotional letter and information sheet explaining the technology utilization program. One week later, a detailed logistical package was sent. All persons who confirmed their attendance received a third letter of confirmation and reminder. All phases of the mail-

out were designed to be simultaneously promotional and informational, and everything possible was done to alleviate the "mass mail-out" appearance. All invitational materials were NASA identified to promote continuity, clarity, and prestige.

The most valuable and crucial phase of the invitational and recruitment process, however, according to evaluations and comments made by participants, was the personal telephone contact made by InterAmerica to each participant. This call enabled participants to clarify any questions regarding the conference or the technology utilization program, and it enabled the contractor to actively promote the conference.

The conference received further exposure through the efforts of NASA's Public Relations Office. Press releases were sent to all minority sponsored newspapers, radio stations, and television stations. This method reached members of the minority business community who were not presently involved in technical areas, but were interested in future expansion possibilities.

The final detailed preparation of the site was usually accomplished one to two days before the conference date. The NASA display was shipped and assembled at the site, materials and information packets were prepared and displayed, and all logistical arrangements were finalized with site personnel. Registration and clerical personnel were briefed and final detail work was done.

The totality of the pre-conference preparation process was directed towards designing a conference situation in which the best

possible communication links would be established. The minority technical business community was prepared and informed of the potential of the program, and the agenda and informational materials were designed to meet the needs of the technical business participants. Thus, the conference was pre-arranged to accomplish the best possible working relationship between the NASA/OMBE technical and support services and the minority business participants.

IV. CONFERENCE ASSESSMENT AND COMPARISON

Conferences were held in six locations throughout the United States. These cities included: Houston, February 27; Los Angeles, May 3; Boston, July 1; San Francisco, September 11; Chicago, October 21; and Atlanta, November 18. The detailed preparation, proceedings, evaluation, and conclusions drawn from each of these conferences are included in Volume I.

Neither the sites nor the dates of the conference series were chosen by InterAmerica. Site and date changes made by NASA personnel during the contract period caused the wide spacing of conferences at the beginning of the series and the overlap of preparations for the final conferences.

The original expectations for participation at the conferences were scaled down as the series progressed. Through the intensive research of minority technical firms in the various regions, it was discovered that there were fewer minority firms with the particular technical orientation and capabilities necessary to take advantage of NASA's technical offerings. It is extremely important to be cognizant of the fact, however, that the firms who were invited and attended were firms of high quality and sincere interest in the program. The focus of the recruitment effort became a concentration on quality rather than quantity. While a "shot-gun" approach may be

useful for some types of information dissemination, the necessity of selecting firms with the capabilities to understand, appreciate, and utilize the services offered demanded a more selective and quality-oriented approach. Those firms who attended the conferences were impressed with the value of this program for their businesses.

A total of 696 minority businesses were personally exposed to NASA's Technology Utilization Program through formal invitation and telephone follow-up. Innumerable companies were made aware of the services through minority newspapers, radio, and television public relations work. A total of 152 minority firms attended the conference series. Although this number appears to be somewhat low, it is again imperative to stress that the firms at the conferences were the minority technical businesses in the various regions with the capability and interest to utilize the services. Possible reasons for the turn-out rate will be further discussed in the evaluation section.

The tables and charts which follow are a detailed summary, breakdown, and description of the minority business community which was exposed to the series of conferences. Through these tables, information related to each individual conference may be noted, conferences may be compared and contrasted to one another, and each conference may be viewed in light of the total series.

Developmental trends should be noted in the graphs. For example, the figures for Houston are somewhat low; however, Houston was the first and thus the most experimental of the conferences. The Houston Conference was of significant value, however, as many

innovations and modifications resulted from experience with participants at that conference. Factors such as these should be considered in interpreting the graphs.

Table I is a general overview of all statistics compiled throughout the series. It indicates the number of invitees, confirmations, attendees, and individual representatives for each individual of conference and the total of all conferences. It also notes the numbers of searches initiated from each conference and the total number of searches which resulted from the series. In addition, a breakdown of companies by sales volumes for each conference and for the series is included. Table I should be utilized as a reference point for all charts and tables which follow as it indicates the real numerical values for all operations. It should also be noted that the conferences are numbered from one to six to simplify the interpretation of figures.

Table IIa compares the total number of invitees, confirmations, and attendees for the series to the percent of total represented by each conference. This chart indicates that Los Angeles, with 24% was the largest conference, while Chicago was second largest with 18%. Boston and San Francisco represent the middle range, with 17% and 16% respectively, while Houston and Atlanta were the smallest conferences, with 13% and 12% respectively.

Table IIb shows, for each conference, the ratio by percent of confirmations to invitees, attendees to confirmations, and searches to attendees for each conference. By this table, it can be seen that Atlanta had the highest confirmation to attendance rate in the series,

TABLE 1

OVERVIEW OF STATISTICS RELATED TO MINORITY BUSINESS ATTENDANCE, RATES, SALES VOLUMES, AND SEARCH INITIATION FOR EACH CONFERENCE

CONFERENCE NUMBER	CONFERENCE LOCATION	FIRMS			FIRM REPRESENTATIVES	SEARCHES INITIATED	SALES VOLUME:	
		INVITEES	CONFIRMATION	ATTENDEES				
1	HOUSTON	97	32	19	24	6	- 50K	8
							-100K	3
							-250K	3
							-500K	1
							+500K	4
2	LOS ANGELES	160	80	37	49	24	- 50K	4
							-100K	3
							-250K	12
							-500K	8
							+500K	10
3	BOSTON	86	45	26	27	14	- 50K	9
							-100K	2
							-250K	4
							-500K	5
							+500K	6
4	SAN FRANCISCO	148	-	24	30	15	- 50K	6
							-100K	5
							-250K	3
							-500K	6
							+500K	4
5	CHICAGO	148	57	28	36	15	- 50K	4
							-100K	7
							-250K	4
							-500K	6
							+500K	7
6	ATLANTA	57	20	18	22	4	- 50K	4
							-100K	3
							-250K	3
							-500K	3
							+500K	5
TOTALS (SERIES OF 6)		696	234	152	188	78	- 50	- 35
							-100	- 23
							-250	- 29
							-500	- 29
							+500	- 36

TABLE 2

TABLE 2a

PERCENTAGE

Numbers at Each Site to Total Numbers for Series

TABLE 2b

Percentage Ratios at Each Site

CONFERENCE NUMBER	CONFERENCE LOCATION	696 INVITEES	234 CONFIRMATIONS	152 ATTENDEES*
1	HOUSTON	14%	14%	13%
2	LOS ANGELES	23%	34%	24%
3	BOSTON	12%	19%	17%
4	SAN FRANCISCO	21%	?	16%
5	CHICAGO	21%	24%	18%
6	ATLANTA	9%	9%	12%
TOTALS		100%	100%	100%

CONFIRMATIONS TO INVITEES	ATTENDEES TO CONFIRMATION	SEARCHES TO ATTENDEES
33%	60%	32%
50%	46%	65%
52%	57%	54%
?	?	63%
36%	49%	54%
35%	90%	27%

*Attendees refer to attending firms

at 90%, with Houston coming in second at 60%. The remaining average out at approximately 50%. San Francisco shows no figures in these columns due to a lack of coordination among local contact personnel which rendered it impossible to finalize confirmation figures.

The searches initiated following each conference are also indicated in this table. Los Angeles has the largest rate of searches to attendees with San Francisco running a close second, at 65% and 63% respectively. It is interesting to note here that WESRAC was the participating Industrial Application Center at these two conferences which showed the highest search to attendees rate. Although a definitive statement cannot be drawn concerning the effectiveness of the various IAC's because many uncontrolled factors are present, it nevertheless must be partially due to WESRAC that these search ratios are so high. Chicago and Boston both indicate a 54% ratio, Houston, the first conference, had a 32% ratio. Atlanta, the final conference, had a 27% ratio.

Chart 1a graphically illustrates the figures noted in Table IIa. Chart 1b shows the number of invitees, confirmations and attendees at each conference and the percentage of the total for the series which each conference represents.

Chart 1c illustrates the figures represented by Table IIb, while Chart 1d compares the number of confirmations at each conference to the percentage of confirmations to invitees at each conference. The second chart in 1d compares the number of attendees at each conference to the percentage of attendees to confirmation at each conference.

CHART I

CHART 1a

COMPARISON: Each Site to Total Numbers

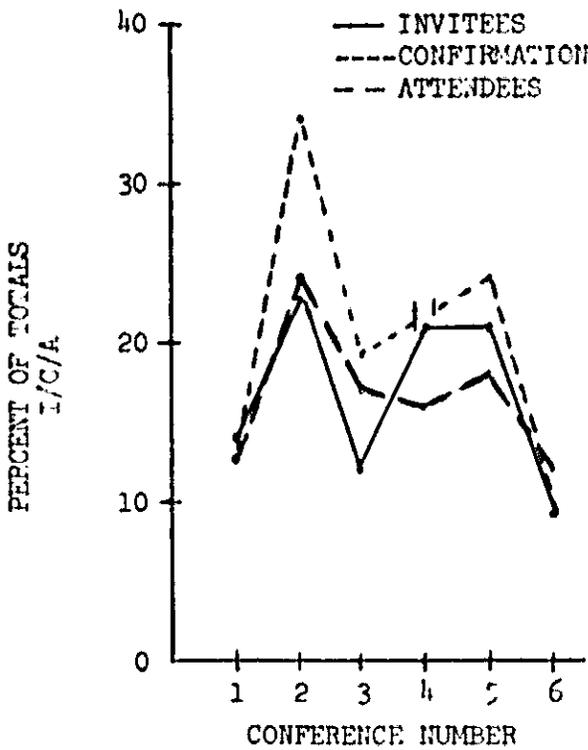


CHART 1b

T=696
INVITEES
% - #

T=234
CONFIRMATION
% - #

T=152
ATTENDEES
% - #

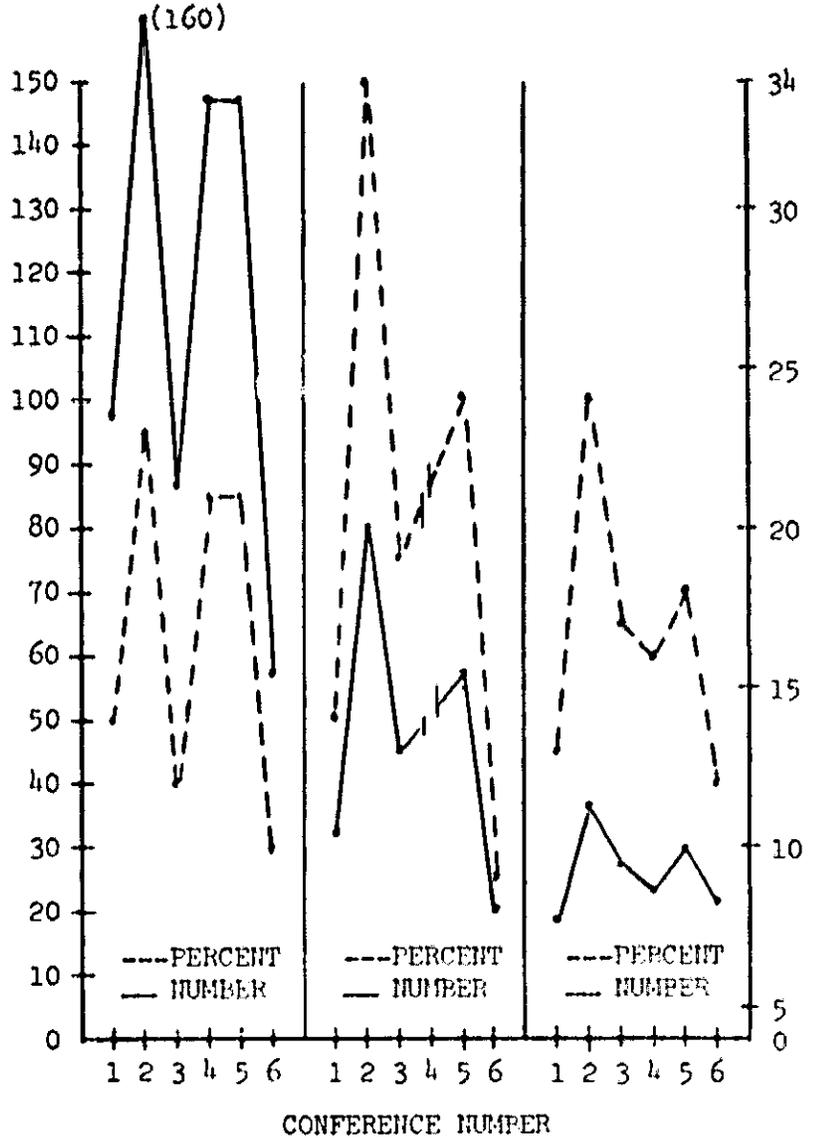


CHART 1d

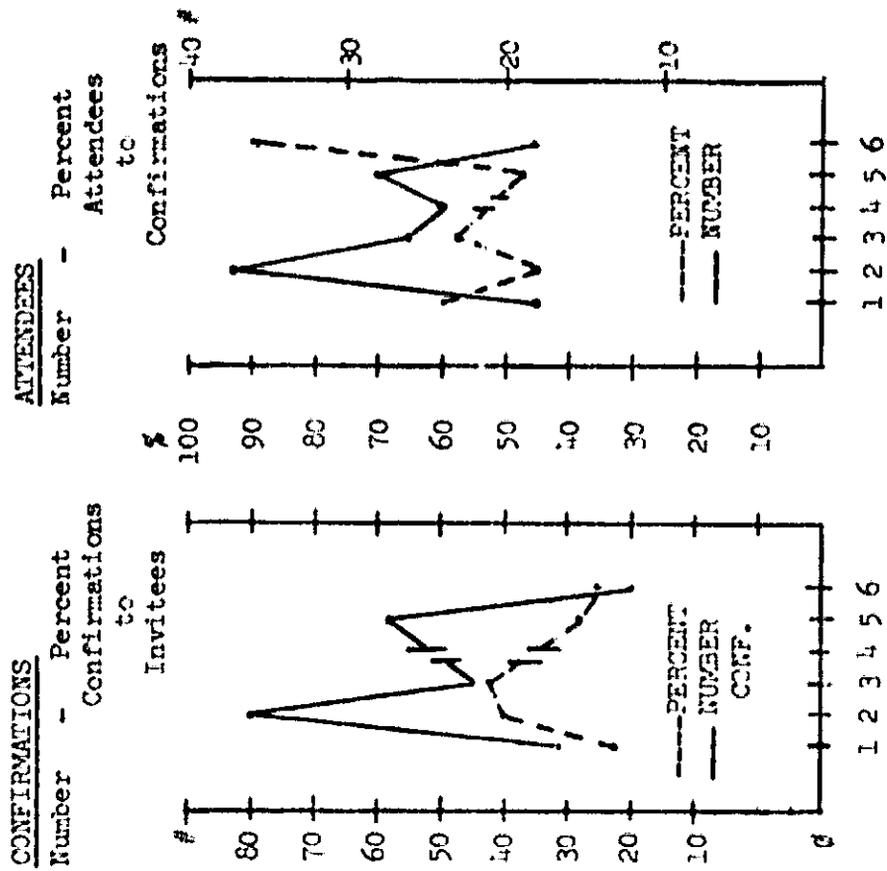


CHART 1c

COMPARISON: Confirmations to Attendees

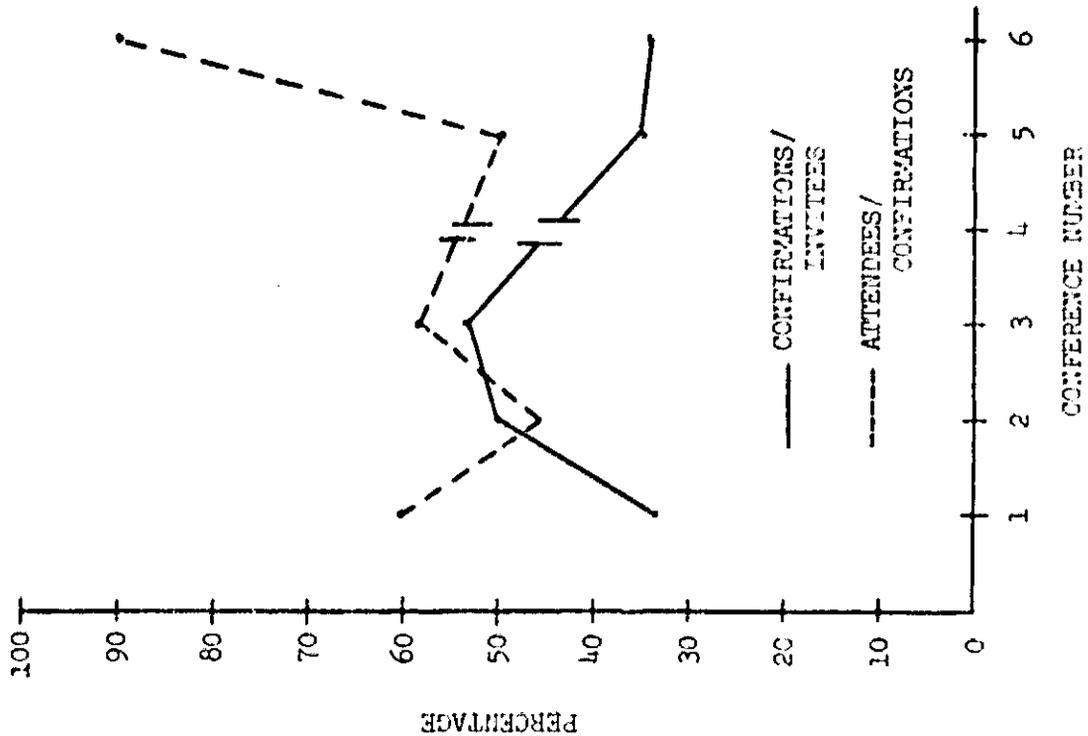


Table III is a detailed compilation of sales volumes figures for each conference and the totality of the conferences. For each site, the table shows the number of companies in each sales volumes category, the percentage of the attending firms this number represents, and the percentage of the total number of firms in this category for all conferences which this number represents. For example, it can be seen in the table that Chicago had seven firms with sales volumes of over \$500,000 which represents 25% of the firms which attended in Chicago. This figure also represents 19% of all firms who attended the series and had sales volumes of over \$500,000. If one wanted to compare this to the totals for the series, it could be noted that there were 36 firms with sales volumes of over \$500,000 which represents 24% of all companies in attendance.

Chart 2a illustrates the total numbers of firms in each sales volumes category for the series and the percentage of the total which each category represents. It can be seen from Chart 2a that the largest number of firms are clustered at the high and low end of the spectrum with more firms of over \$500,000 than firms with less than \$50,000. Firms with between \$100,000 and \$500,000 sales volumes represent approximately 38% of all firms at the conferences. The large number of firms clustered at the high end of the spectrum indicates that the quality of minority business participants attending these conferences was extremely high, and that the vast majority of firms represented had the capability of utilizing the services offered.

Chart 2b shows the number and percentage of firms at each site

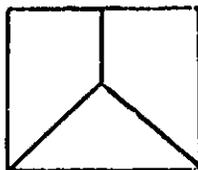
TABLE 3

SALES VOLUME
NUMBER AND PERCENTAGES

CONFERENCE NUMBER	CONFERENCE LOCATION	LESS THAN 50,000	50,000-100,000	100,000-250,000	250,000-500,000	500,000+	TOTAL
1	HOUSTON	8 42 23	3 16 13	3 16 10	1 5 3	4 21 11	19 100 13
2	LOS ANGELES	4 10 11	3 8 13	12 32 42	8 22 26	10 28 28	37 100 24
3	BOSTON	9 35 26	2 7 9	4 16 14	5 19 17	6 23 17	26 100 17
4	SAN FRANCISCO	6 25 18	5 21 22	3 12 10	6 25 22	4 17 11	24 100 16
5	CHICAGO	4 14 11	7 25 30	4 14 14	6 22 22	7 25 19	28 100 18
6	ATLANTA	4 22 11	3 17 13	3 17 10	3 17 10	5 27 14	18 100 12
	TOTALS	35 23	23 15	29 19	29 19	36 24	152 100

NOTE:

Number Per ———
Location



Percent Per
Location

Percent
of Total

SALES VOLUME: Number & Percentage
 Total Participants - All Conferences
 By Sales Volume

CHART 2a

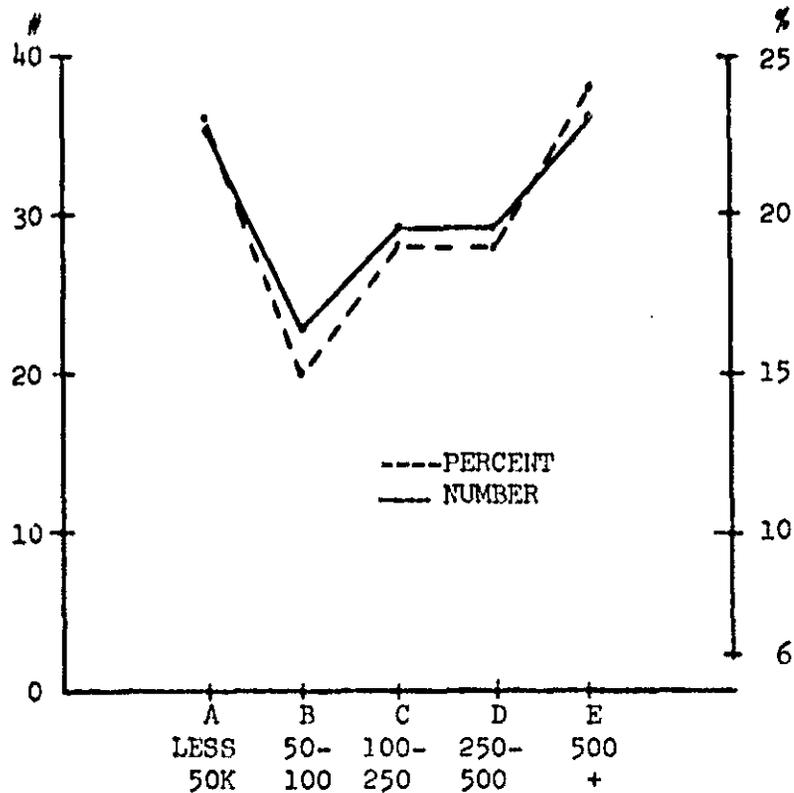
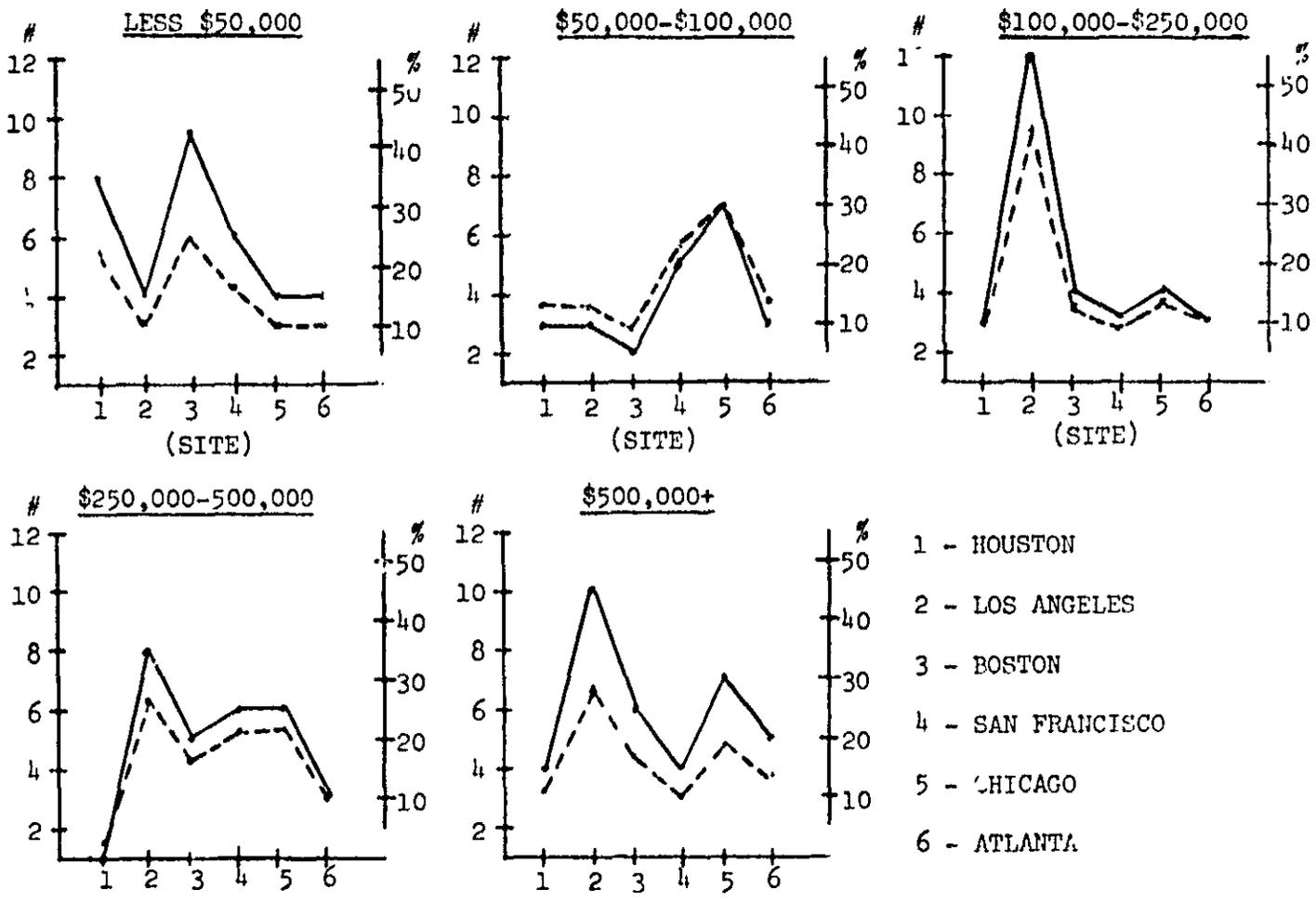


CHART 2b



SALES VOLUME - Number & Percentage of Participants by Site Location

CHART 2c

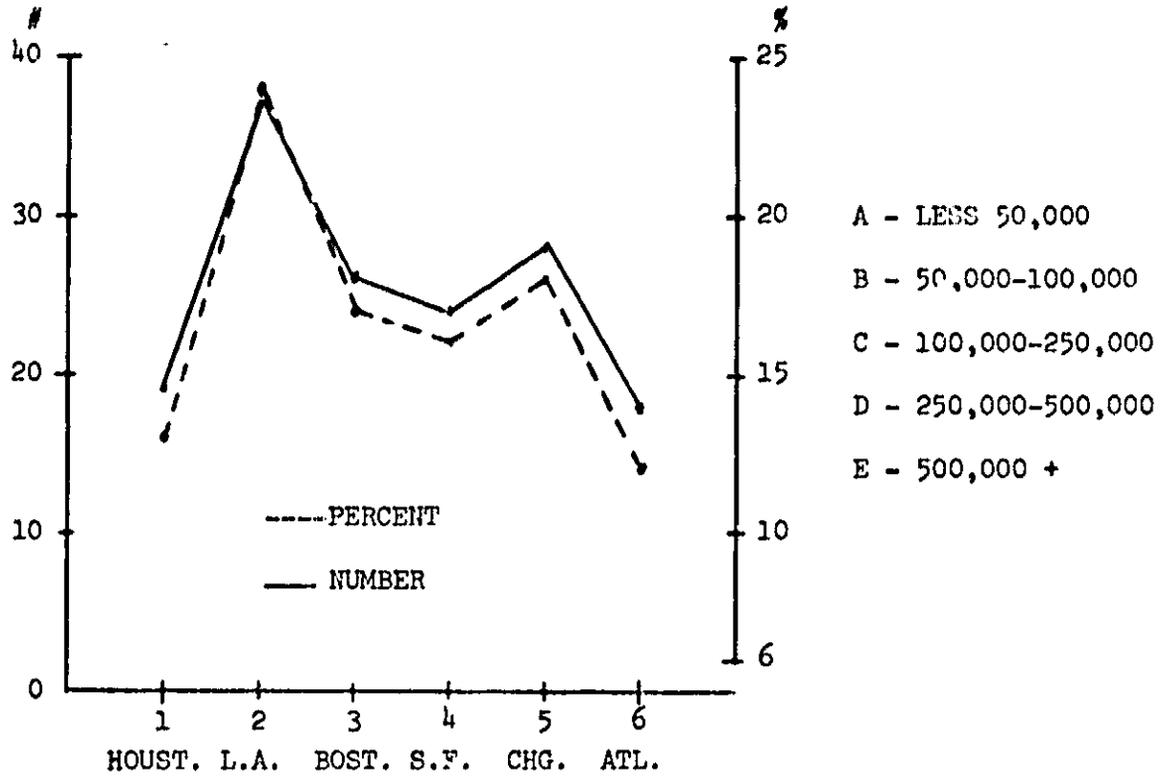
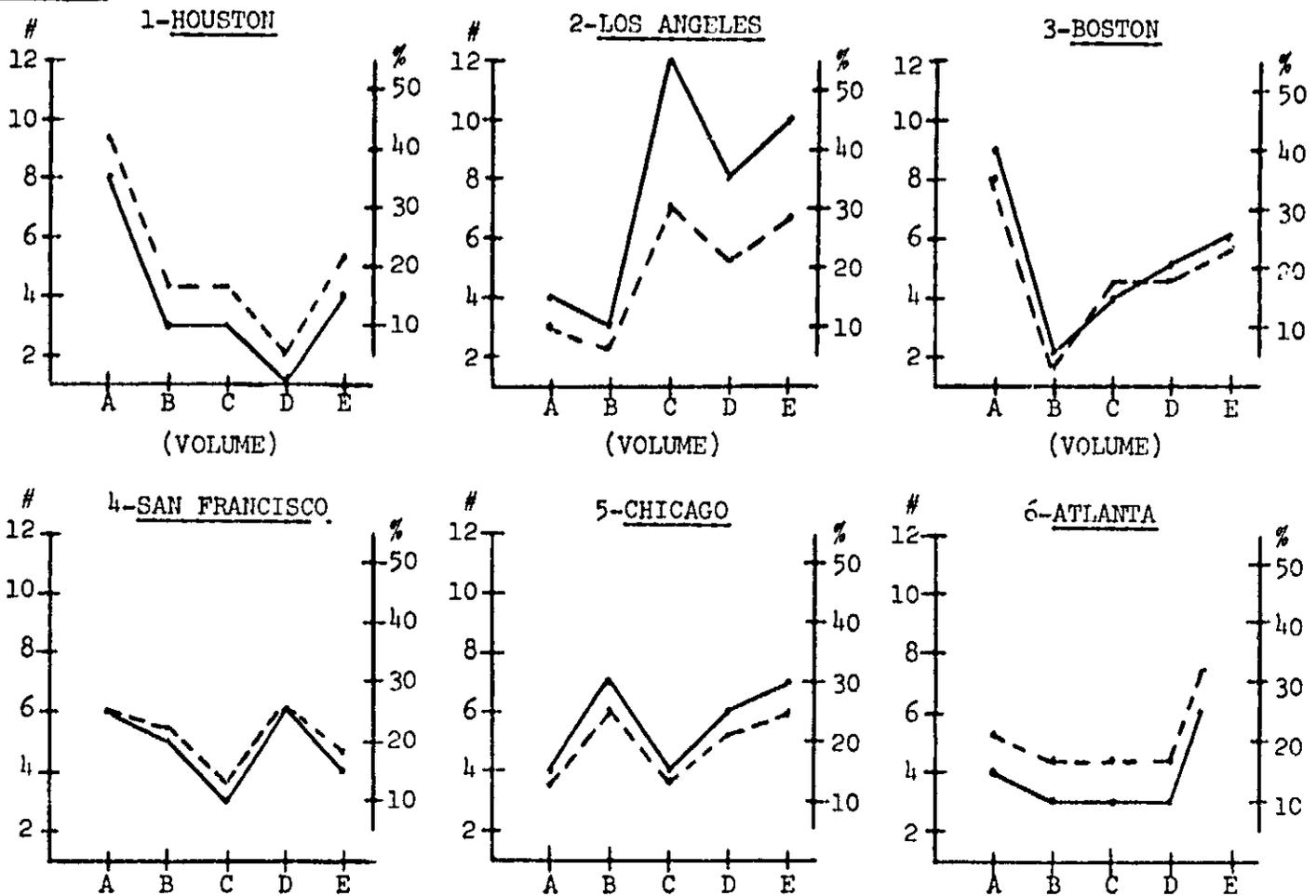


CHART 2d



in each sales volume category. Viewing the conferences relative to one another, Boston encompassed the highest percentage of firms in the under \$50,000 category; Chicago showed the highest percentage of \$50,000-100,000 firms; L.A. of \$100,00-250,000, \$250,000-500,000, and \$500,000 and above. It must be kept in mind when reading these charts that the number of firms attending each conference is a significant factor; thus, LA's high representation in the top three categories may be related to the high attendance rate at the conference.

Chart 2c illustrates the number and percentage of total participants which each site encompasses. Chart 2d shows the number and percentage of each category of sales volume for each site. In these charts it can be seen that the largest number of participants in Houston had sales volumes of under \$50,000; in Los Angeles the largest number was in the \$100,000-250,000 range; in Boston, the largest number was under \$50,000; in San Francisco, it was between \$250,000-500,000; and in Chicago and Atlanta, it was over \$500,000. This series of charts shows a general trend upward, with the exception of Boston, towards firms with high sales volumes and technical capabilities. Thus, it may be inferred that the recruitment process became increasingly successful in producing the types of firms whose capabilities and interests were compatible to the program.

Chart 3a illustrates the number of searches initiated compared to the number of attendees at each conference. Chart 3b graphs the percentage of searches to attendees for each conference. The highest number and percentage of searches/attendees occurred in Los Angeles;

CHART 3a

COMPARISON: NUMBER OF ATTENDEES
TO SEARCHES

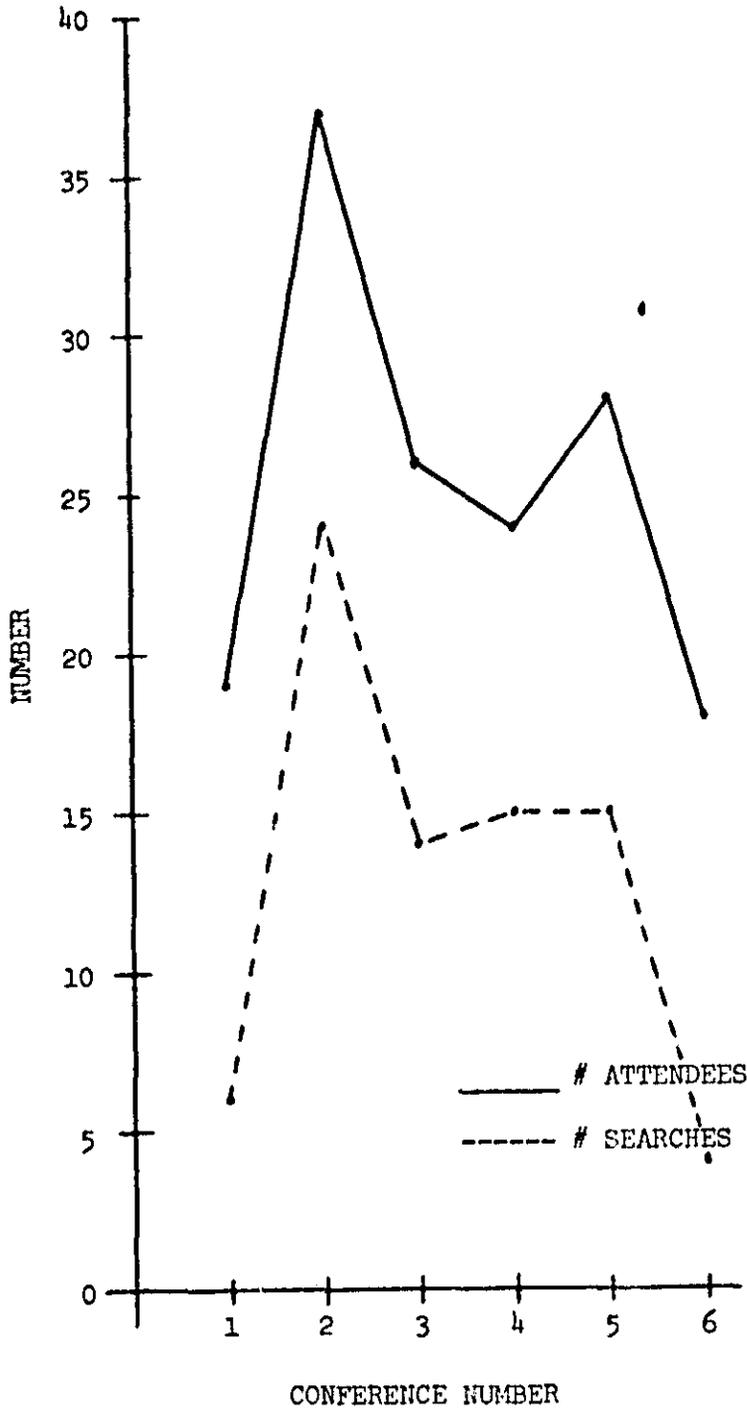
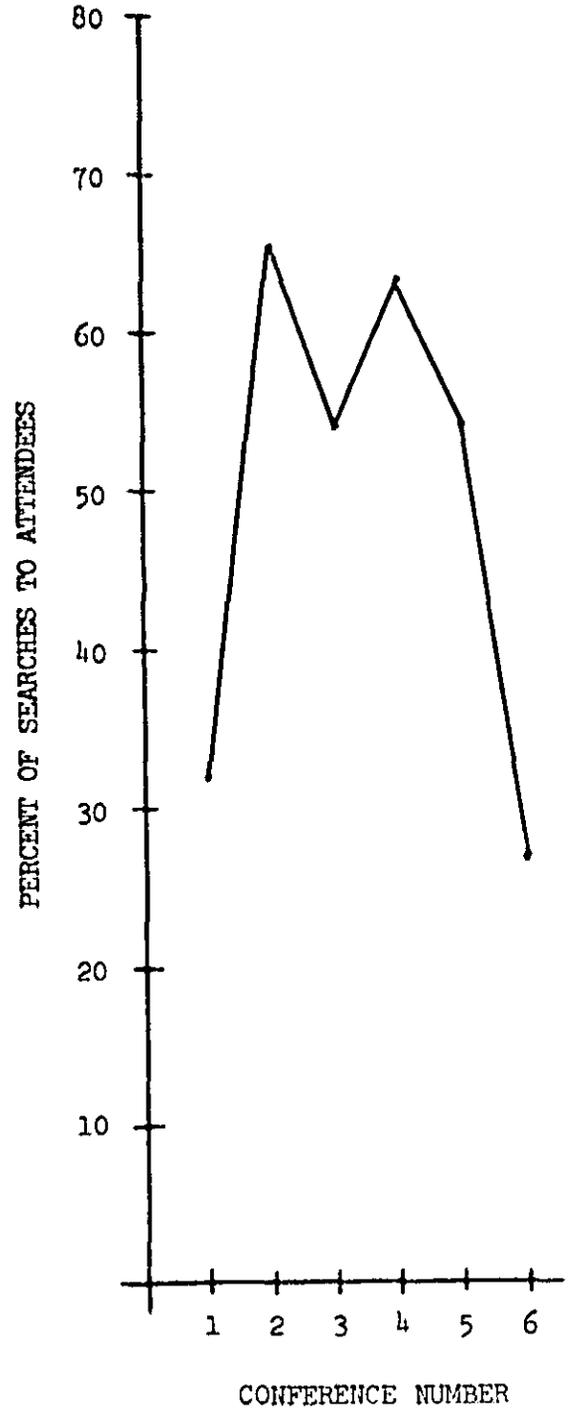


CHART 3b

PERCENT OF SEARCHES
TO ATTENDEES



the lowest in Houston and Atlanta; the remaining conferences level off at between 50% and 60%.

In viewing the total picture presented by these figures, a number of facets concerning the conference series are elucidated. The number of attendees was smaller than expected; however, the quality of firms was of a high level. There is a gradual increase in the sales volumes of companies as the conference series progressed, which indicates the successful development of the recruitment process. Additionally, the percentage of turn-out to confirmations at the Atlanta Conference was extremely high which is reflective of the success of the finalized recruitment and invitational procedures and the high degree of support provided by local personnel. As expected, the highest attendance rates were in the cities with high industrial and minority business activity. In addition, there is a high positive correlation between the number of searches initiated and the level of sales volumes of the companies in attendance. It appears that the higher the sales volume, the better the potential for search initiation. This, in turn, raises the possibility of actual transfer.

Although InterAmerica was not required to follow-up on the attendees at the conferences, InterAmerica is aware of two firms who have successfully utilized the search results in their operations. In San Francisco, Mr. Frank Iwama of Innovative Products Associated, Inc. has applied for a non-exclusive license for U.S. and foreign use of a zinc based paint which was found through the catalyzing agent of the

San Francisco Conference. In Los Angeles, Southern California Industries is preparing to demonstrate the utility of flat conductor cables to various government agencies in order to illustrate its utility and marketability. If demonstrations are successful, the flat conductor cable will then be readied for manufacture and distribution. Although these two cases illustrate the effectiveness of conference activities for two firms, it is actually much too early to judge the overall transfer potential which was tapped. Results must be tabulated over the next few years in order to determine the effect of the conference series on the minority business community.

The statistical configurations presented here illustrate that the goals of the seminars were successfully achieved. Almost 700 technically oriented minority businesses were exposed to the TU program and NASA's search services through invitational procedures, and over 150 high quality, technically capable minority firms were directly offered searches of the data banks through their attendance at the conferences. Since the actual search initiation and level of productivity of firms can be positively correlated, the decision to concentrate on quality rather than quantity proved to be warranted. This conference series illustrated that the technical substrata of the minority business community was actively and positively involved in the program and has excellent potential to become involved in transfer activities.

V. EVALUATION

As previously noted, this progressive series of six technology utilization seminars had certain developmental and experimental aspects. There were numerous unknowns at the outset of the contract, and many substantive questions were answered through this series of conferences. In addition, implementation of the conferences and subsequent follow-up raised a number of questions concerning the best methods of facilitating transfer to minority businesses.

The search for the specific types of technically oriented minority firms, capable of utilizing the services offered, resulted in the most comprehensive up-to-date listing of these firms in the regions covered. InterAmerica found that one of the major tasks of the contract was the screening, up-dating and consolidation of all available listings. To InterAmerica's knowledge, the lists which are currently on file are the most up-to-date listings of these firms extant.

The number of participants attending the conferences was significantly lower than originally expected. This was due to several factors.

First, and most importantly, there were significantly fewer technically oriented minority firms with the interest and capabilities to appreciate and utilize NASA's services than were perceived at the outset.

Second, of the firms which composed the original invitee lists, it was found in each conference that a sizeable minority (about 20%) in each city had gone out of business, and another significant percentage (about 10%) were not manufacturing firms.

Third, a sizeable number of firms were unable to attend the conferences. Because each invitee was personally contacted, it is possible to determine the reasons for the initial rejection. The most frequently mentioned reason was the size of the firm. Many minority businesses are extremely small, 3 - 4 man shops, and it is neither possible nor monetarily feasible to lose a key man for a day. One invitee concisely and simply stated this problem when asked his reason for not attending, "I have to work." A smaller number of businessmen indicated that they did not presently have the capabilities to take advantage of new services or technology. Several firms were already operating at a level somewhat beyond their expectations and did not perceive a need for innovation at present. A number of invitees expressed hostility toward government programs because of the frustration and futility of past encounters. This type of reason for non-attendance was significantly lessened when the agenda was compacted and shortened to encompass only the actual substance of the technology utilization program. In fact, the agenda finally designed was seen by many participants as a rare and unique program in that it presented a real and valuable opportunity without non-essential and self-serving elements.

Fourth, there was a significant drop from confirmations to

attendees. InterAmerica made a random sampling of invitees who confirmed but did not attend. A number of businessmen indicated personal and uncontrollable factors such as illness or personal crisis. The majority indicated that a business emergency had prevented them from attending, a problem inherent to a minority business conference. In a small firm, crises may arise which can only be handled by the key man, and a conference, even if it presents valuable opportunities, must fall by the wayside.

It should be stressed again that the firms which attended the conferences represented the more elite minority business community, and the businessmen who attended represented the firms which had the ability to utilize the services. It is felt that the quality and relevance of the firms in attendance was extremely important to the success of the series. It would be pointless and frustrating for a firm without relevant skills and interest to attend this type of conference, and would further increase the hostility of the minority business community toward government programs. As it was, the firms in attendance were impressed, enthused, and interested in the program, and expressed overwhelmingly positive reactions.

The restructuring of the seminar also increased the positive motivation of firms in attendance. The concentration on the technology utilization workshops, with downplay of general presentations and procurement sessions, increased the interest and positive reactions of participants to the program. Valuable services were being offered at the conferences, a free search of NASA's computer banks for new products,

processes, or techniques which might be transferred to the minority firm, in addition to which the participant was being offered access to a massive and helpful research and development bank. As it became obvious that these practical tools should be stressed, as opposed to presentations concerning general agency services or procurement possibilities, the level of interest in the conference grew. It is apparent that technology utilization may be one of the most valuable services which the government has to offer to minority businessmen because it is a concrete, self-perpetuating, and utilizable tool rather than a nebulous offer of services. Thus, this aspect of the conference was emphasized and stressed.

The cities which were chosen by NASA for this series of conferences included several cities with large minority technical business populations and several in which the population was less dense. Cities with high industrial and minority business populations are obviously the ideal setting for a conference such as this. Because of the development nature of this series, the necessity for exposing the program to as many regions of the country as possible may be seen as a viable method of choosing sites. However, for a more cost effective and efficient program in the future, cities with better participant populations might be chosen. Methods of implementing such a plan will be further discussed in the Recommendation Section.

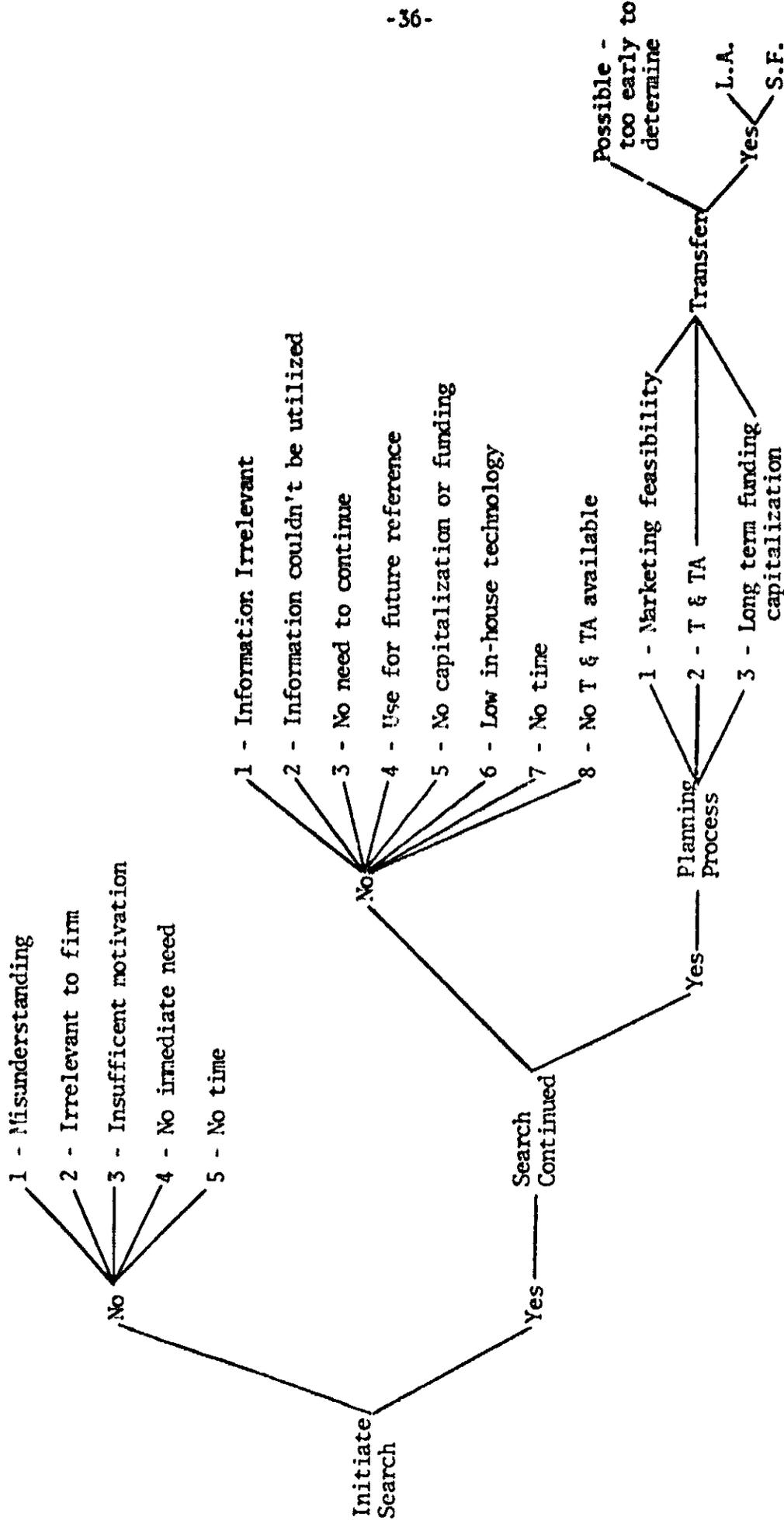
The purpose of this conference series was to facilitate the

transfer of NASA technology to minority businesses. Two cases in which the conferences acted as a catalyst for transferring technology have been discussed, but these should be viewed as merely examples of the potential of the conferences. In most cases, it is much too early to determine whether or not transfer will take place. However, a number of questions and hypothesis may be raised concerning the follow-up process by minority businessmen.

After the conference, the burden of initiative has passed from the sponsoring agencies to the minority business participants. If a search is to be done, the minority businessmen must initiate it through his own questions, interests, or problem areas. As illustrated in Chart #4 , a decision tree is established from this point onwards which determines whether or not transfer will occur. After the conference, the participants may or may not initiate a search. If he does not, the reasons might be because he found the information at the conference irrelevant to his firm; he could not see an immediate need for the service; he did not have the time to spend on initiating a search; or he was not sufficiently motivated by conference activities. If he did initiate a search, then in order for transfer to take place, he must follow it up by taking steps to incorporate the information into his present operation. If he does not follow-up, the following reasons might be applicable: the information was irrelevant to his firm; the information could not be incorporated at the present time; he does not have the time to concentrate on incorporating the innovation; he does not have the

CHART 4

SEARCH AND FOLLOW-UP DECISION TREE



monetary capabilities; or, technical assistance is unavailable or unknown. If he does follow-up on the search, transfer will occur if his company has the applicable capabilities and he is aware of a market for the innovation.

The decision tree presented here illustrates a number of possibilities of how transfer can or cannot take place. It is not within the scope of this contract to initiate intensive follow-up work on the participants, but the questions raised by the decision tree demand to be answered if significant numbers of transfers to minority businessmen are to occur in the future. The answers to these questions will design a viable and working method of technology transfer to the minority business community. This will be discussed further in the Recommendations and Conclusions Section.

The evaluation of this conference series must include some discussion of the in-put of the Task Force Members on the production of the conferences. Because of the nature of the seminars, the contractor worked closely with the members of the Task Force to insure the proper dissemination of technology utilization and supportive services information. Members of the Task Force included Mr. Ray L. Gilbert, of NASA's Technology Utilization Office, Mr. James Dixon of NASA's Office of Equal Opportunity, and Mr. Theodore Lettes of the Department of Commerce, Office of Minority Business Enterprise. Mr. Gilbert was of inestimable assistance in preparing the agenda and devising a program which would properly present the Technology Utilization Program. He worked closely with the various Industrial Application Centers to determine a

program which would best utilize the services of the local IAC and best serve the minority business community. He also served as moderator for the last five conferences. Mr. Dixon's assistance in choosing possible sites, directing the contractor to local contacts, and monitoring the project contributed greatly to the program's success. Mr. Lettes, as the OMBE representative on the task force, directed the contractor to various local personnel and OMBE Offices who would be able to provide assistance and services. He also provided information concerning numerous supportive services for the businessmen at the conference. Each member of the Task Force remained in constant contact with Inter/America and was always ready to provide advice and assistance.

In a developmental overview of this series of six conferences, it can be seen that numerous factors which came to light at the beginning of the series were considered and controlled in producing the conferences at the end of the series. It is contended that the conference method developed represents a viable and successful method of exposing minority businessmen to the possibilities of technology transfer. There were also many questions raised concerning the follow-up to the conferences, the answers to which might guarantee the successful transfer of technology to numerous minority firms. It is our intention, in the Recommendations and Conclusions Section, to expand on the issues which have been raised and present a number of possibilities for future courses of action.

VI. RECOMMENDATIONS AND CONCLUSIONS

The transfer of technology to the minority business sector is a process involving many factors. The conferences which have been held this year represent a large step towards opening communication lines and facilitating transfer. As has been indicated, many facts concerning technology transfer were discovered and incorporated into the production of these conferences. Additionally, a number of questions were raised in evaluation of the contract. Recommendations as to future modes of operation will consider the totality of these facets.

First, the choice of locales for sites should be based on a serious and detailed examination of the type and quantity of industrial operations in the area in conjunction with the quality and quantity of minority business involvement in that industry. Before the initiation of any additional technology transfer conference series, a considerable amount of time and research should be expended in determining the most fertile grounds for the program. This would produce a program with high success rates and cost-effectiveness. In addition, this type of research would enable the conference producers to pre-plan the emphasis of each conference and thus involve increasingly specified and technical personnel both from the sponsors and from the minority business community.

Second, a complete and comprehensive listing of minority manufacturers with relevant qualifications for technology utilization, should be compiled. Firms with the applicable level and type of technical qualifications must be extracted from available resources.

The results of the conferences have shown that the technology utilization program is most successful when firms with relevant capabilities and interests are exposed to the program. Although there are numerous compilations of minority manufacturers and entrepreneurs, these lists must be screened to produce firms with transfer potential. Because of the series, InterAmerica has on file a comprehensive listing of these firms in the regions covered. However, due to the nature of this conference series, all regions of the United States were not covered. A complete listing would enable persons interested in transferring technology to determine the strongest and most productive areas to target. InterAmerica found, in the course of the task, that information concerning minority technical manufacturers had to be procured from numerous and scattered sources, and that no single listing was completely comprehensive and up-dated. If the goal is to transfer technology, the single most imperative factor is determining the available receptors for this technology. Thus, the listing initiated through this conference series should be expanded to include every city and region throughout the United States. This would make possible educated and informed decisions concerning transferring to the minority business community.

Third, any program attempting to expose minority businessmen

to technology transfer must concentrate on the substance of technology utilization and downplay any non-essential elements. It was discovered throughout these conferences that the minority business participants had a high regard for technology utilization as a practical, useful, and valuable tool. It was also found that they were either indifferent or even hostile towards any kind of filler material presented on the program, whether that material involved agency service presentations or procurement sessions. Disregarding either a positive or negative assessment of past programs, the fact is that many minority businessmen feel that they have had negative experiences when they attempted to utilize government services in the past. The businessmen had extremely positive reactions to the technology utilization program, and it is felt that a concentration on this in the future should outweigh any presentations which elicit negative connotations of the past. Additionally, most small minority businessmen do not have the time to spend on conference niceties, and they completely approved of the "working" orientation of these conferences. The meat of the program, the technology utilization workshops and seminars, should continue to outweigh by percentage of time the combined total of the orientation portions of the program. The positive motivational force which the workshops produce is by far the most important product of the conference day.

Fourth, the focus of recruitment efforts should remain on quality rather than quantity. While it is extremely important that as many minority technical businesses as possible should be exposed to the possibilities of technology transfer, it is equally important that

the companies in attendance find the program relevant, interesting and useful. Inviting companies who find the conference pointless and frustrating because it is irrelevant to their needs is counterproductive both to the sponsoring agencies and the minority business community. It should be noted that many of the companies present at this series were technically capable of utilizing the services and thus had positive reactions to the program. In order for the minority business community to become aware of the possibilities available to them through NASA, the best exposure possible is the satisfied reactions of those participants who attend the conference. Effectively, one transfer is worth a thousand words.

Fifth, a follow-up study of participants should be initiated to determine the factors involved in post-conference search activity. Firms which did not initiate searches should be sampled to determine the reasons; companies who initiated searches and did not follow them up should be sampled to determine reasons. If a company did not initiate a search after the conference, the reasons, as hypothesized in the evaluation section, should be definitely determined. If the participant perceived the search offer as being irrelevant to his firm, or the conference did not sufficiently motivate him, steps should be taken to determine if his perception of irrelevancy is accurate, or if other methods of presenting the technology utilization program might have had more motivational force. If a number of businessmen saw no immediate need for the search or had no time at present to initiate one, but expressed interest in possible future applications, it might be advisable to establish a permanent mailing list of these companies to encourage future utilization.

If a company initiated a search but there was no follow-up done, the reasons for non-utilization of the information should be determined. This research would be extremely important in deciding whether support and assistance programs should be strengthened to make the technology utilization program a truly viable and valuable program for minority businessmen. If the information received was relevant to the firm and could be utilized, it should be determined whether monetary or technical limitations prevented its use. Businessmen should be asked if funding or support services were contacted, and if contacted, what was the outcome of the communication. It should be determined if currently existing minority support organizations are cooperative and helpful in implementing technology transfer, and if so, whether the minority business community utilizes this source. Many businessmen at the conferences expressed difficulties in furnishing the capital required to accomplish a transfer. Minority business support organizations are theoretically in existence to facilitate these transactions. It is necessary to determine if they are being utilized for this purpose, and if they are fulfilling the businessman's needs in this area. Similarly, if technical assistance was necessary, did the businessman approach the applicable channels and did he receive the desired assistance. If the businessman initiated a search and discovered utilizable technology, it is imperative to determine why he did not use it. If the answers imply that technical assistance or minority business support organizations are not fulfilling expectations,

then these factors must be strengthened in order to encourage the implementation of actual transfers.

If the information received was irrelevant, couldn't be utilized at present, or was being stored for future possibilities, and the businessman expressed continued interest, then communications should be kept open in order to encourage future transactions.

In conclusion, it is imperative that attendees be sampled to determine their utilization of the services offered. Any factors which are basic to implementing transfer and can be controlled or strengthened should be emphasized and utilized to their full potential.

Sixth, companies which initiated searches should be monitored to determine when and how the received information is utilized. As explained earlier, the technology utilization process often takes a significant amount of time before a transfer reaches fruition. The time frame can be estimated at as long as one to two years. Thus, in order to accurately judge the results of this program the companies who initiated searches should be monitored to determine if transfers actually occur. Additionally, it might be discovered that although the information received through the first search was unusable, the company may return to the Industrial Application Center at some future point to solve a problem. If a transfer results from this search, it might be indirectly traced back to this conference series as the initial contact. In order to accurately assess the impact of this series of conferences on the minority technical business community, it is not only advisable but in fact necessary to continue a follow-up program on

the companies in attendance.

Seventh, any funding monies which are appropriated for technology utilization should bear directly on the primary goal. The evaluations of minority business participants concerning this program overwhelmingly emphasized the necessity of concentrating on the substance of the program. While a certain amount of sophisticated promotional tools were necessary to expose the program so as to attract the target community, the basic thrust of the conference should remain practical. For example, the free search funded by NASA's Technology Utilization Office was perhaps the most popular aspect of the conference because of its eminently practical applications. Funding should concentrate upon this type of utilizable tool and additional sources of technical assistance rather than on non-essentials. Again, the best method of promoting transfers is producing transfers.

The technology utilization concept may be one of the most valuable programs to be introduced to the minority business community. When successfully applied, it has the potential of upgrading a small minority business such that technical capabilities and thus profits are permanently expanded. The opportunities it can potentially offer to the minority businessman are virtually limitless in scope and can be applicable to firms of diverse interest and capability levels. The concept has the parallel advantage of disseminating the massive amount of public research and development of information compiled through the tax dollar to the private sector.

It has been proven that the minority business community is extremely receptive towards the idea of technology transfer, and has reacted positively towards the program in every city in which it was presented. If the above recommendations were implemented, a number of factors related to successful transfer of technology to the minority business community would be clarified. The conjunction of these factors and the successful format which InterAmerica has developed in producing the past six conferences present a coherent and viable plan for future technology utilization by the minority business community.