TECHNOLOGY UTILIZATION IN A NON-URBAN REGION:
FURTHER IMPACT AND TECHNIQUE OF THE
TECHNOLOGY USE STUDIES CENTER (6)

C. HENRY GOLD, Ed.D
Director

A. M. MOORE
Industrial Specialist

BILL DODD
Industrial Specialist

SUSAN G. WEST
Administrative Assistant

FINAL REPORT, NASw-2629

TECHNOLOGY USE STUDIES CENTER
SOUTHEASTERN OKLAHOMA STATE UNIVERSITY
DURANT, OKLAHOMA 74701
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ACKNOWLEDGEMENTS

All personnel of the Technology Use Studies Center contributed special
time and effort toward the preparation of this Final Report.

Special recognition is noted on behalf of Mr. Bill Dodd, Industrial
Specialist, and Mrs. Susan West, Administrative Assistant and Secretary, who
were responsible for compiling the details and written content of the report.

Others who made valuable contributions to the report are A. M. Moore,
Senior Industrial Specialist; Kenny Hebert, John Martin, and James Aina,
Information Retrieval Assistants; and Linda Coker, Brenda Futrell, Susan
Grossman, Sherry Rider, Teri Smith, and Darlene White, Clerical Assistants.

As usual, the University Print Shop personnel, and especially its
manager, Cecil Sullivan, were most helpful and professional with the print-
ing/duplication aspect of the finished report.

C. Henry Gold

January 1976
SUMMARY

NASA Contract NASw-2629 provides that the Technology Use Studies Center (TUSC) submit a Final (annual) Report as set forth in Article III.

TUSC clientele data has been updated and is shown in Chapter I. This information is presented as a continuation of client data included in prior-year Final Reports.

NASw-2629 contract-year date (June 1, 1974 to May 31, 1975) was amended through contract modification no. 2 to extend time of performance to December 31, 1975. Therefore, this report covers a time period of nineteen months. The contract modification resulted from the desire of the NASA TU office to contract the TUSC effort on a calendar-year basis. Work performance and contractor accomplishments have been routinely reported through Quarterly Status Reports; i.e., QSR #36, QSR #37, QSR #38, QSR #39, and QSR #40. Activities, functions, and accomplishments for the last quarter (October–December 1975) are included in this report.

Chapters II, III, IV, and V have been arranged and sets forth data to correspond with the Statement of Work as provided in Article I of the TUSC contract (Dissemination and Assistance, Faculty Information Service, Cooperation with Other Agencies, and General Aviation News Letter.)
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</tbody>
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CHAPTER I

TUSC CLIENTELE INFORMATION

TUSC "clients" are firms, agencies, or individuals with whom the Center has provided a service; i.e., anyone who has requested (and received) information or a service of TUSC.

For the purpose of Annual Report continuity, client information to follow is a continuation of that which has been reported in previous Annual Reports. Tables I, IV, and VI identify clients as Firm, Individual, and/or Special. Special Clients include research organizations and local, state, or federal agencies. For example, TUSC enjoys a special relationship with TU personnel in the Small Business Administration. Because of the fine dialogue and success of the Center's cooperative interactions with the SBA Region VI TUO, we have also had the privilege of working with SBA TU representatives located in New York, Colorado, Pennsylvania, and Illinois.

When considering the long-standing challenge related to NASA Technology Utilization; i.e., "provide for the widest practical and appropriate dissemination of information concerning NASA activities and results thereof," the cooperative interchange with the SBA not only makes sense, it is a practical and appropriate mode for information dissemination on behalf of one of the most important sectors of the Nation's public.
### TABLE I

**NUMBER OF NEW TUSC CLIENTS BY CLASSIFICATION AND YEAR**

<table>
<thead>
<tr>
<th>Year</th>
<th>Firms</th>
<th>Special</th>
<th>Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>9 (cum)</td>
<td>-- (cum)</td>
<td>-- (cum)</td>
</tr>
<tr>
<td>1965</td>
<td>12</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>1966</td>
<td>37</td>
<td>58</td>
<td>11</td>
</tr>
<tr>
<td>1967</td>
<td>21</td>
<td>77</td>
<td>10</td>
</tr>
<tr>
<td>1968</td>
<td>22</td>
<td>99</td>
<td>39</td>
</tr>
<tr>
<td>1969</td>
<td>34</td>
<td>133</td>
<td>32</td>
</tr>
<tr>
<td>1970</td>
<td>21</td>
<td>154</td>
<td>36</td>
</tr>
<tr>
<td>1971</td>
<td>11</td>
<td>165</td>
<td>40</td>
</tr>
<tr>
<td>1972</td>
<td>6</td>
<td>171</td>
<td>46</td>
</tr>
<tr>
<td>1973</td>
<td>4</td>
<td>175</td>
<td>19</td>
</tr>
<tr>
<td>1974</td>
<td>11</td>
<td>186</td>
<td>45</td>
</tr>
<tr>
<td>1975</td>
<td>5</td>
<td>191</td>
<td>80</td>
</tr>
</tbody>
</table>

### TABLE II

**TUSC CLIENTS FIRMS, BY NUMBER OF EMPLOYEES**

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 25</td>
<td>106</td>
</tr>
<tr>
<td>25-49</td>
<td>26</td>
</tr>
<tr>
<td>50-99</td>
<td>26</td>
</tr>
<tr>
<td>100-249</td>
<td>13</td>
</tr>
<tr>
<td>250-499</td>
<td>9</td>
</tr>
<tr>
<td>500 and over</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>191</strong></td>
</tr>
</tbody>
</table>
### TABLE III

**COMPOSITION OF TUSC CLIENT FIRMS, BY TYPE OF FIRM**

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td>47</td>
</tr>
<tr>
<td>Mining</td>
<td>3</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>141</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>191</strong></td>
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</tbody>
</table>

### TABLE IV

**TUSC CLIENTS BY GEOGRAPHIC LOCATION**

<table>
<thead>
<tr>
<th></th>
<th>Firms</th>
<th>Individuals</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oklahoma Project Area</td>
<td>107</td>
<td>277</td>
<td>31</td>
</tr>
<tr>
<td>(19 counties)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remainder of Oklahoma</td>
<td>53</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>Texas Project Area</td>
<td>10</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>(15 counties)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remainder of Texas</td>
<td>12</td>
<td>22</td>
<td>4</td>
</tr>
<tr>
<td>Other States</td>
<td>9</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>191</strong></td>
<td><strong>366</strong></td>
<td><strong>62</strong></td>
</tr>
</tbody>
</table>

**NOTE:** A map of TUSC's Project Area is included as Appendix A.
<table>
<thead>
<tr>
<th>Two Digit SIC Classification</th>
<th>Number of Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Crude Petroleum and Natural Gas</td>
<td>2</td>
</tr>
<tr>
<td>19 Ordnance and Accessories</td>
<td>0</td>
</tr>
<tr>
<td>20 Food and Kindred Products</td>
<td>7</td>
</tr>
<tr>
<td>22 Textile Mill Products</td>
<td>1</td>
</tr>
<tr>
<td>23 Apparel and Other Finished Products Made from Fabrics and Similar Materials</td>
<td>4</td>
</tr>
<tr>
<td>24 Lumber and Wood Products, except Furniture</td>
<td>5</td>
</tr>
<tr>
<td>25 Furniture and Fixtures</td>
<td>4</td>
</tr>
<tr>
<td>26 Paper and Allied Products</td>
<td>4</td>
</tr>
<tr>
<td>27 Printing, Publishing and Allied Products</td>
<td>2</td>
</tr>
<tr>
<td>28 Chemical and Allied Products</td>
<td>6</td>
</tr>
<tr>
<td>29 Petroleum Refining and Related Industries</td>
<td>4</td>
</tr>
<tr>
<td>30 Rubber and Miscellaneous Plastic Products</td>
<td>11</td>
</tr>
<tr>
<td>31 Leather and Leather Products</td>
<td>2</td>
</tr>
<tr>
<td>32 Stone, Clay and Glass Products</td>
<td>12</td>
</tr>
<tr>
<td>33 Primary Metal Industries</td>
<td>6</td>
</tr>
<tr>
<td>34 Fabricated Metal Products, except Ordnance, Machinery and Transportation Equipment</td>
<td>23</td>
</tr>
<tr>
<td>35 Machinery, except Electrical</td>
<td>33</td>
</tr>
<tr>
<td>36 Electrical Machinery, Equipment and Supplies</td>
<td>14</td>
</tr>
<tr>
<td>37 Transportation Equipment</td>
<td>11</td>
</tr>
<tr>
<td>38 Professional, Scientific and Controlling Instruments: Photographic and Optical Goods; Watches and Clocks</td>
<td>9</td>
</tr>
<tr>
<td>39 Miscellaneous Manufacturing Industries</td>
<td>13</td>
</tr>
</tbody>
</table>

*Total will not equal 141 because some firms have more than one manufacturing classification.


**TABLE VI**

RECIPIENTS OF TUSC SERVICE

<table>
<thead>
<tr>
<th>Classification of Recipient</th>
<th>Number of Recipients</th>
<th>Number of Searches*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms</td>
<td>191</td>
<td>402</td>
</tr>
<tr>
<td>Individuals:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southeastern State University</td>
<td>206</td>
<td>327</td>
</tr>
<tr>
<td>East Central State College</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Oklahoma State University</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>University of Oklahoma</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>Other Oklahoma Colleges</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>Texas Colleges</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Other Colleges</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Other Individuals</td>
<td>111</td>
<td>154</td>
</tr>
<tr>
<td>Special</td>
<td>62</td>
<td>805</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>619</strong></td>
<td><strong>1,802</strong></td>
</tr>
</tbody>
</table>

*All requests (for searches and assistance) are included in the "Number of Searches" column (including general or non-technical information requests); therefore, the total number of searches reflected in this table will not coincide with the total number of searches as reported in Appendix B.
CHAPTER II

DISSEMINATION AND ASSISTANCE

The contractor shall disseminate information and provide technical assistance to industrial firms and other organizations.... This dissemination and assistance service shall be provided in a manner designed to bring about the utilization of NASA-generated technology by recipients and to promote a better understanding of the process by which such technology is made available...

(Statement of Work, NASw-2629)
The foregoing TUSC Performance Chart sets forth relevant statistical data as to quarterly and annual search accomplishments of the Center.

The chart below graphically illustrates the trend of the Center's dissemination/assistance service for an eight-year time period (searches were not recorded before September 1966).

SEARCH HISTORY AND ACCOMPLISHMENTS
BY TUSC PER CALENDAR YEAR
As mentioned in the Summary, NASw-2629 was amended by NASA to provide for work performance, and time of performance based on the calendar year. An all-time record number of searches (324) were processed in 1975 by the Center. A calendar-year comparison was tabulated for 1974, 1973, 1972, and 1971. Searches processed per year were 293, 201, 229, and 142, respectively. These search numbers will not coincide with those shown on page 7, the vertical dash lines indicate the months included in each contract year, which generally has been the fiscal year.

Data pertaining to the Center's accomplishments during the first three quarters of 1975 have been reported in QSR Nos. 38, 39, and 40. The October-December TUSC accomplishments are included herein. More searches have been processed in this quarter (101) than any quarter in the history of the Center. Approximately 50% of the search activity relates to the "Faculty Information Service" work statement in the contract. It was reported in QSR #37 that the University had included a course of study concerning information retrieval systems. The course was offered again in the fall semester of 1975, and 45 of the above-mentioned searches resulted from student research on technical data retrieved through the assistance of TUSC personnel (reference searches 1627 through 1671, pages 65-68). The course provides an excellent overview of NASA's TU program to a wide range of people, and students explore a broad area of technology. A complete list of searches processed during the contract period (1 June 1974 - 31 December 1975) is set forth in Appendix B). The period of performance, as previously mentioned; was
extended seven months; therefore, this Final Report covers a nineteen-month time period.

TUSC has continued its mode of operations relative to information retrieval. The vast majority of information disseminated was obtained using manual retrieval resources and techniques; also the Information Retrieval Team consists of 100% student employees. Typical clients are individuals with limited resources, and very small business firms. The Center maintains a very strong alliance with the Small Business Administration, especially the Region VI Technology Utilization Officer because the SBA client and the TUSC client have so much in common.

Another effective source of information dissemination by TUSC has been the General Aviation News Letter; it is edited and published locally with outstanding cooperation and assistance from the NASA General Aviation Technology Office. The NASA Field Centers also provide valuable information included in various issues of the News Letter. Appendix D provides information in greater detail about the News Letter.

Two areas of continuing special interest to TUSC are the Occupational Safety and Health Act of 1970 (OSHA) and the Equal Employment Opportunity Act (EEO). To remain current on guidelines or revisions to laws that affect virtually all sectors of industry, the Center has been represented at OSHA and/or EEO state and local meetings.

During the contract period, a Technology Management Information System (MIS) was developed to improve "results" reporting by the various Industrial
Applications Centers (IACs). The MIS report was applicable to the last two quarters of calendar year 1975. However, information included in the report covered the entire year. An important aspect of the report refers to 

**Client Benefits.** Class A benefits are those wherein an economic gain (whatever its form) is documented and Class B benefits are those wherein the recipient documents acknowledgement of gain but cannot express a specific "payoff." For 1975, TUSC reported four Class A benefits and seventeen Class B benefits. The reader of this report will probably conclude that TUSC has been conservative in the reporting of benefits after reviewing client correspondence included in Appendix C—the information relates to the nineteen-month contract period; however, not all information set forth in Quarterly Status Reports Nos. 36, 37, 38, 39, and 40 is included in this report.

The above-mentioned benefits are considered as NASA TU Transfers, two of which occurred during the final quarter; they are:

**Transfer 185** — Design and manufacture of an inverter for wind energy systems... (Search 1488). The president of C-D Electric Motor Sales provides documentation (page 86) of the value of information obtained, i.e., "I am at present considering becoming a distributor for this inverter. This would not have been possible had I not received the article from Mr. Pierce" (SBA).

**Transfer 186** — Elimination of noise pollution in a machine shop... (Search 1480). The firm, Terry Southwest, Inc., communicated (page 87) that: "We have effected a barrier and, to a great extent, eliminated the problem (noise) we previously reported."
The interest of TUSC/SBA clients is consistent with that as reported in the 1974 Final Report; i.e., energy, electronics applications, pollution, waste disposal, and wastewater treatment. The following list of searches are representative, but not all-inclusive:

Energy -- Searches 1307, 1323, 1324, 1332, 1335, 1357, 1444, 1587.

Electronics -- Searches 1207, 1260, 1279, 1292, 1347, 1373, 1438, 1488.

Pollution -- Searches 1344, 1359, 1430, 1480, 1501, 1556, 1588, 1598.

Recycling Waste or Disposal -- Searches 1203, 1276, 1318, 1355, 1401, 1540, 1570, and 1620.

Wastewater Treatment -- Searches 1283, 1457, 1460, 1485, 1513, 1599, 1612.

Questions concerning various technical applications for energy by far outnumber all other requests pertinent to a particular topic. The subject of safety also ranks high on the list of information retrieved. It is interesting to note that client requests reflect a growing concern for matters related to mankind's environment.

TUSC has maintained a high level of cooperation with the University Biology Department and personnel working with the Wastewater Treatment Project. Requests for information about the water treatment method (pages 57-60, 1974 Final Report) of the Project are routinely coordinated with personnel involved in the Project and the Center. From the standpoint of potential, the University Wastewater Treatment Project probably presents TUSC the
opportunity to extend NASA's TU services and "benefit payoff" far beyond any achievements of the Center in its history. Throughout the contract period TUSC has cooperated closely with the University Biology Department and personnel involved in various wastewater research activities (pages 119-120). Grayson County College (Texas) is planning to install a six-lagoon wastewater treatment system incorporating the major operating principles of the system for water treatment as set forth in the 1974 Final Report (pages 57-60). TUSC is coordinating a request from the Cooke County (Texas) Environmental Agency to visit the University facility. The University had a visitor from Bolivia to seek assistance concerning water treatment problems. Bolivia's national disruptions have delayed further progress; however, communications remain open with Bolivians directly concerned with wastewater management.

Other South American countries have communicated an interest in the University Wastewater Management Program through a representative of the University of Monterey (Mexico). Dr. Frank Wade, a Southeastern biologist, has been extended an invitation to discuss matters pertaining to aquaculture and wastewater management. Countries that have extended invitations to Dr. Wade are Costa Rica, Guatemala, Panama, Colombia, and Venezuela.

Appendix C provides a Transfer and Impact Report. It is a compilation of letters from TU clients responding to queries about the value of the TU program from an individual or business prospective.
CHAPTER III

FACULTY INFORMATION SERVICE

The Contractor shall continue to provide information services to selected faculty research personnel at Southeastern State University, Oklahoma State University, the University of Oklahoma, and other state colleges and universities. (Statement of Work, NASw-2629)

A basic function of the Center is to provide information dissemination and assistance service; as quoted above, the service is extended to colleges and universities. Some of the cooperative efforts have previously been mentioned in Chapter 1. During the contract period, approximately 25% of the searches processed (120) provided information services as set forth in the Statement of Work. This level of service is consistent with such services during previous years.

We are extremely pleased with the reciprocative nature of the working relationship that has been a trademark of the TUSC/Faculty interaction. Part of the information provided with Search 1466 was obtained by the Center from the University Technology Department (Electronics). The client responded favorably and requested TUSC to provide additional information (Search 1502). A firm that manufactures rat and mouse poison was referred to TUSC by the University Biology Department (Search 1512). The Biology Department also assisted the Center with Searches 1457 and 1460. The
interaction resulted from a field trip by Industrial Safety students. The plant manager was familiar with the University's Wastewater (sewage) Project and inquired about possible solutions to the plant's wastewater problem. As a result, TUSC extended an invitation to the quality control supervisor of the plant to visit with the Project Director, Dr. Frank Wade. Although industrial waste differs in that it is nonorganic, Dr. Wade discussed possible alternatives that could lead to a relatively inexpensive solution to the problem (pages 113-114).

TUSC has been serving as an intermediary relative to requests concerning wastewater treatment. It helps Professor Wade by relieving him from administrative duties and it helps us by providing a channel through which the TU program and benefits are exposed.

We have been pleased to provide assistance to the University Debate Team. The most recent request of the Debate Team concerned information relating to the topic of land usage; i.e., reservoirs and recreation, highways, housing and urban development, farming and agriculture, etc.

In cooperation with Oklahoma State University, TUSC provided assistance in the location of three reports which our clients were unable to obtain through NTIS and other information retrieval sources. In this regard, the Center is acquiring somewhat of a "bird dog" reputation through the successful retrieval of otherwise unobtainable data.

The University of Oklahoma referred graduate students to TUSC for economic reference material pertaining to southeastern Oklahoma.
One of the more distant examples of college/university cooperation involved TUSC assistance to Ohio State University. The request was no doubt a spin-off of the General Aviation News Letter as the Department of Aviation made a telephone request about NASA CR-257 "Cloud Motion in Relation to the Ambient Wind Field"—a copy of the report was obtained and forwarded.

Other contacts with colleges/universities relative to the General Aviation News Letter are mentioned in Chapter V.
The Contract shall continue to work closely with and attempt to develop new cooperative efforts with (1) institutions operating under or in conjunction with the Oklahoma State Technical Services Program, (2) organizations established under the Public Works and Economic Development Act of 1965, and (3) other public and private organizations and institutions concerned with promoting the economic and technological development of the region. (Statement of Work, NASw-2629)

Small Business Administration

The excellent (continuing) cooperative effort and related communications with the Small Business Administration (SBA Region VI) has been previously implied through references in Chapter 11. SBA selected documentation is set forth in Appendix C (Transfer and Impact Reports) as a reflection of the Center's working relationship with the SBA. Quarterly Progress Reports (QSR Nos. 36-40) contain most of the documentation for time periods covered; therefore, it is not practical to reproduce and include a repeat documentation of all SBA interactions in this report. For example, during the contract period, TUSC has filed 180-200 pages of related SBA material pertinent to TU activities.

That which is included in Appendix C is intended to give the reader an example of the NASA-SBA cooperative effort and accomplishments through TUSC.
A different aspect of SBA cooperation was mentioned in our 1974 report; i.e., the Small Business Institute (SBI). The School of Business provides service to selected small businesses on a contractual basis. For the present academic year, the SBA contracted for 32 SBI cases—12 cases have thus far been completed. The TUSC Director is the budget administrator and coordinates matters pertaining to the SBI. Basically, the purpose of SBI is to provide management counseling for selected SBA clients. It provides a "real life" workshop for students and faculty of the School of Business and Industry. As previously reported in QSR #40, the TUSC Director, Dr. C. Henry Gold, was honored by the SBA by his appointment to a two-year term on the Oklahoma District Advisory Council (SBA), reference page 70.

Not only has the Center rendered assistance to the SBA Region VI TU Officer, but SBA TU Officers located in Pennsylvania, New York, Colorado, and Illinois, as well.

Department of Labor

Although there have been no direct contacts with DOL, TUSC is a resource, and provides information to clients on matters relating to the Occupational Safety and Health Act and that portion of the Equal Employment Opportunity Act of which DOL has cognizance/responsibilities.

Department of the Interior

The University has a contractual relationship and obligation relative to the Interior Department's responsibilities to provide various First Aid and Mine Safety
certificate programs. One of the most innovative aspects of the Safety program is the "School on Wheels" or mobile training unit--TUSC search assistance was mentioned in QSR Nos. 37 and 39. A news article on the Mobile Mine Safety and First Aid Program is included in Appendix C. The "moving classroom" has been utilized in approximately 36 safety training sessions wherein approximately 400 persons received training (or retraining). A measure of its success is validated by the fact that the Department of the Interior is expanding the program through the authorization of newer training units that will have the capability to train 1,000 mine personnel. Safety training subjects will include electrical hazards/permissibility, hydrostatic and/or hydraulic systems safety as well as first aid and mine safety. Three mobile units will be utilized in the effort. TUSC provides search services and assistance.

Oklahoma Association for Affirmative Action

The Association was formed to help promote formal liaison with national, state, and local agencies involved with equal opportunity compliance in employment (and in education). TUSC Industrial Specialist, Mr. Bill Dodd, was elected to serve a two-year term as vice president of the Association. Membership includes representatives of all state-supported institutions of higher education. Industry representatives are also encouraged to attend meetings; thus, it provides a fruitful area whereby the services of TUSC are made known.
The Center has cooperated with various agencies on matters pertaining to aviation; these cooperative efforts/services are included in Chapter V, General Aviation News Letter.
CHAPTER V

GENERAL AVIATION NEWS LETTER

The contractor shall prepare and distribute a newsletter directed to the general aviation audience. This newsletter should be issued quarterly during the period of performance of this contract. (Statement of Work, NASw-2629)

The General Aviation News Letter approach to disseminating information was approved originally by the NASA TU office through a no-cost letter agreement as another information dissemination experiment by TUSC. The success of the News Letter has been especially rewarding to our Senior Industrial Specialist, Mr. A. M. Moore, who also serves as editor of the publication.

Appendix D of the Center's 1974 Annual Report provides background information on the first five issues of the publication. At that time, we had received 245 formal responses to our mailing list that totaled 420 recipients. Now the mailing list numbers well over 1,700, of which 263 recipients are USAF Junior ROTC units. TUSC approved a request from the ROTC to reproduce the News Letters for distribution to the 32,000 students involved in the ROTC program. There is no doubt a spin-off circulation of unknown numbers as a result of the ROTC distribution.

This particular medium of information dissemination has been slanted to give more exposure to the first "A" in NASA's title; i.e., aeronautics. Furthermore, it is addressed to the aviation community where the greatest number
of people having an interest in aeronautics are found; namely, general aviation. This particular effort has been closely coordinated with NASA's General Aviation Technology Office to insure that there has been no duplication. The TUSC publication is written in non-engineering language for the non-engineer person who has an interest in aviation research and development programs or advancements; whereas, the NASA office distributes engineer-level publications in answer to the needs of the typical aeronautical engineer.

To help stay abreast of current trends in aviation, Mr. Moore has aligned himself with the National Aerospace Writers Association, the National Business Aircraft Association, the National Agricultural Aviation Association, etc. He is also in frequent contact with NASA Field Center personnel involved in or knowledgeable of research projects and developments of interest to the typical general aviation enthusiast.

The News Letters published in 1974 are identified as Volume I; a total of five were published. The 1975 News Letters are identified as Volume II; seven were published. Therefore, beginning with each contract year, the News Letter series will be identified by Volume and the next succeeding Roman numeral.

The most recent issue of the News Letter (Volume II, No. 7) is included as a part of Appendix D for information of the reader.

Agencies and organizations that have corresponded with the Center, in addition to those mentioned above, include the Flying Physicians Association, Inc.; Professional Pilot; San Jose State University; Bakersfield College; Northwestern University; Lock Haven State College; Montana State Superintendent; Oklahoma
Aeronautics Commission; Jet Propulsion Laboratory; AOPA; University of Nevada; and the Connecticut Bureau of Aeronautics.

Correspondence referring to the General Aviation News Letter is included in Appendix D.
APPENDIX A

TUSC PROJECT AREA
APPENDIX B

SUMMARY CHARACTERISTICS OF TUSC TECHNICAL SEARCHES
## SUMMARY CHARACTERISTICS OF TUSC TECHNICAL SEARCHES

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I-S -- An individual student
I-T -- Any individual who is working in technology research for a government agency
I-F -- An individual faculty member
I-O -- Any other individual who is not employed by a manufacturing firm, agency, or a school system

NOTE: Unless otherwise indicated, client is located in the State of Oklahoma.
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Okla City Planning Department | Oklahoma City                 |
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<td>1471</td>
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<td>Elas- General Purpose Computer for the Equilibrium Problems of Linear Structures</td>
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<td>Design and Manufacture of an Inverter for Wind Energy System Changing AC to DC Current in 6000 Watt Range</td>
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<td>Grinding of Optical Glass in Aspherics or Free From Spherical Abberations</td>
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<td>Bonding of Dissimilar Materials, Especially Wood to Liquid Polymurethane</td>
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<td>Ablative Protection and/or Fire Resistant Coating Material Capable of Long-term Protection</td>
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<td>Plastic Bottle Material Handling Equipment Having an Automatic Processing Feature</td>
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<td>Flow Properties and/or Processability of Rigid PVC or Polyolefin Resins</td>
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<td>Is There a Non-fire Supportive Construction Material, in the Foam Plastic Family, to Substitute for Polyurethane Foam?</td>
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<td>Bizhen Matin, SSU</td>
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<td>1651</td>
<td>Fuel Cells</td>
<td>I-S</td>
<td>O. D. Barnes, SSU</td>
<td>Durant</td>
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<td>1652</td>
<td>Hydrogen Auto Fuel</td>
<td>I-S</td>
<td>Asghar Muhammad, SSU</td>
<td>Durant</td>
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<td>1653</td>
<td>Minicomputers</td>
<td>I-S</td>
<td>Vasan Choopaichitr, SSU</td>
<td>Durant</td>
</tr>
<tr>
<td>1654</td>
<td>Use of Lasers</td>
<td>I-S</td>
<td>Sina Shamsabadi, SSU</td>
<td>Durant</td>
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<tr>
<td>1655</td>
<td>Fireproof Paint</td>
<td>I-S</td>
<td>Sommanous Na-Bangchang, SSU</td>
<td>Durant</td>
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<td>1656</td>
<td>Sensors to Detect Smoke and Fire</td>
<td>I-S</td>
<td>Larry I. Moody, SSU</td>
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<td>1657</td>
<td>Use of Lasers</td>
<td>I-S</td>
<td>Charasphant Charaseri, SSU</td>
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<tr>
<td>1658</td>
<td>Wind Energy and Its Practical Application</td>
<td>I-S</td>
<td>J. D. Stiles, SSU</td>
<td>Durant</td>
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<td>SEARCH NUMBER</td>
<td>SEARCH SUBJECT</td>
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<td>CLIENT</td>
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<td>Suraphol Tankawatanakul, SSU</td>
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<td>1660</td>
<td>Hydrogen as a Substitute Energy Source</td>
<td>I-S</td>
<td>Tadatsura Suzuki, SSU</td>
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<td>1661</td>
<td>Geothermal Energy</td>
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<td>1662</td>
<td>Airconditioning System by Solar Energy</td>
<td>I-S</td>
<td>Somwhung Wirushsilpa, SSU</td>
<td>Durant</td>
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<td>1663</td>
<td>Evaluating Materials for Corrosive Service</td>
<td>I-S</td>
<td>H. L. Moyers, SSU</td>
<td>Durant</td>
</tr>
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<td>1664</td>
<td>Heat Pipes</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
</tr>
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<td>1665</td>
<td>Apollo-Soyuz Project</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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<td>Apollo-Soyuz Project</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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<tr>
<td>1667</td>
<td>Secondary Uses of Waste Paper</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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<td>Geothermal Energy</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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<td>1669</td>
<td>Hydrogen as a Substitute Energy Source</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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<td>Metal Corrosion Control</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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<td>1671</td>
<td>Light Scattering Photometers</td>
<td>I-S</td>
<td>SSU Student</td>
<td>Durant</td>
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</table>
APPENDIX C

TRANSFER AND IMPACT REPORTS
AUG 5 1975

Mr. C. Henry Gold
Dean, School of Business and
Industry
Southeastern Oklahoma State
University
Durant, Oklahoma 74701

Dear Mr. Gold:

On behalf of the Small Business Administration, I am pleased to appoint you to a two-year term on the Oklahoma District Advisory Council.

This Agency, the only one created specifically to help small business, relies heavily on its advisory councils. The members do many things to assist the SBA in helping the nine-million small businesses of this country.

Details of this activity are outlined on the enclosed memorandum and more information will be provided for you by the District Director, Truman Branscum.

You will learn from association with the other members of the council at the meetings at least twice a year, that outstanding community leaders are appointed to the councils.

These dedicated citizens serve without pay.

With your help we can make a significant contribution to the economic well-being of this Nation, and I have full confidence that this can be done.

The time and effort you give to SBA and small business will be greatly appreciated.

Sincerely,

Thomas S. Kleppe
Administrator

Enclosure
August 8, 1974

Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Re: Technology Utilization Officer:

Dear Mr. Grose:

I am pleased to respond to your inquiry regarding the information provided by Mr. Charles Pierce, Technology Utilization Officer.

Information on two items was requested. In the general category of heat transfer from gas to liquid and specifically sheet metal fin design, useful references were provided promptly and a follow up call by a specialist, Mr. Peavy of the National Bureau of Standards, added book references and knowledgeable review. This information is being studied and will be considered in improved design of our food processing equipment.

The second item of information regarded orifice design for columnated air. The prompt and extensive bibliography will require considerable study but is being studied now. Mr. Ruegg of the National Bureau of Standards followed this inquiry and was, also, knowledgeable and helpful.

Both of these technical inquiries can improve our products and help us make better new food fryers and ovens.

Sincerely yours,

ASSOCIATED FOOD EQUIPMENT COMPANY

Donald Paul Smith, President

Transfer 171
TUSC Search #1210
NASA TB's 68-10504, 63-10346, 67-10555, 65-10291
NASA Lit. Search #26073

ORIGINAL PAGE IS OF POOR QUALITY.
September 16, 1974

Mr. Donald D. Grose
Assistant Regional Director
Procurement Assistance
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose:

Thank you for your letter of September 3, 1974. It has provided us an opportunity to express our appreciation and thank you for the excellent help given us by Mr. Charles Pierce.

We asked Mr. Pierce's help in obtaining information on two very highly technical subjects. We received the benefit of the NASA data bank and were put in personal contact with a NASA expert in the field. While only a small company, we are working on certain advanced technology and have a patent position in the field of high temperature combustion.

It is very gratifying to know that NASA, the technology leader of the world, has set up such a fine system of technology transfer. Without it, it seems our county would lose the benefit of such a large investment of past highly successful technical space programs.

Please give our personal thanks to Mr. Pierce and feel free to use these comments as you please.

Sincerely yours,

John W. Small
General Manager

JWS:es

Transfer 172
NASA Lit. Search #26303
TUSC Search #1231
NASA TB's 67-10608
70-10215
72-10199
71-10455
71-10116
70-10580

NASA SP-5052
Small Business Administration  
1720 Regal Row  
Dallas, Texas 75235

Attention: Charles Pierce

Re: Our request for availability of miniature color photographic cameras

Dear Mr. Pierce:

We wish to thank you for your assistance in the search we requested. The literature which we received contained a total of four evaluation forms which I very hurriedly answered in part. Very simply stated, we did not obtain anything concerning miniature color photographic cameras; however, the volume of references concerning aerial photography, television cameras, and liquid waste problems round the United States and the world was very impressive.

The literature did contain one reference number, A71-35788 sub-miniature television camera by Westinghouse Electric Corporation. The referenced TV camera is 1.5 x 1.5 x 5 inches and presents a backward type solution to our type problem using this sub-miniature TV camera in conjunction with a standard water-proof sewer survey camera, we may be able to achieve the desired result. We have contacted the Westinghouse Electric Corporation and this camera is, in fact, available although somewhat expensive in single quantities. The sub-miniature TV camera, in addition, permits the solution of other difficult inspection problems we have. In short, Mr. Pierce, the literature search was beneficial although the evaluation sheets may not tend to indicate so.

Sincerely,

THE PENETRYN SYSTEM, INC., PCSD

James T. Conklin, P.E.
Division Engineer

JTC:ahg

Transfer 173

TUSC Search #1286
NASA TB's 67-10469
72-10190
72-10733

NASA Lit. Search #26894
November 18, 1974

Mr. Donald D. Grose
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas  75235

Re: Your letter of November 4

Dear Mr. Grose:

Shortly after making my request for technical information from Mr. Charles Pierce, I received both telephone calls and written information concerning both areas of interest. The information regarding an antistatic agent for teflon FEP film was somewhat sparse, due in part to the fact that little work has been done on such coatings by government or industry. We did receive a few samples of commercially available material, but found them unsatisfactory for our purposes.

The information concerning a high temperature and abrasion resistant coating for aluminum castings has been quite helpful, especially that provided by Goddard Space Flight Center. We are currently formulating paints following the Goddard procedures, and hope to obtain a useable formulation within a few months. When completed, this paint will be used by the casting manufacturer as a part of his processing operations.

In general, we have been quite pleased with the information obtained from the SBA, and I have always found Mr. Pierce to be exceptionally prompt and knowledgeable.

Sincerely,

INSTITUTE FOR RESEARCH, INC.

INSTITUTE FOR RESEARCH, INC.

Dan E. Posey
Laboratory Manager
Mr. Donald D. Grose  
Assistant Regional Director  
for Procurement Assistance  
Small Business Administration  
Region VI  
1720 Regal Row  
Dallas, Texas 75235  

Dear Mr. Grose  

In reply to your letter of January 8, 1975, let me advise that we have received correspondence and information pertaining to P. C. board fabrication and electronic assembly. We are most grateful for this information and have been able to put it to good use. This kind of information is good in two respects; first, it tells us about government quality standards and in general high-quality standards. Secondly, it helps us measure our own quality. We hope that you will be able to supply additional data of this nature from time to time.  

More importantly to our present needs is sales. We are extremely anxious to learn of governmental agencies and private industry who contract for services we provide. Let me assure you that we will follow up on each and every lead you provide.  

To recap briefly our capabilities, we are essentially a contract engineering and manufacturing facility. We produce P. C. boards, cables, chassis, test sets, panels and any other type of electrical and electronic assembly. All of which are produced to customers' specifications and drawings. We also provide instrument repair.
and calibration service. This service is primarily provided to local and regional customers. However, the assembly work and engineering services are provided for a nation wide customer base.

We continue to appreciate your assistance.

Very truly yours,

R. H. ANDERSON - Divisional Vice-President

RHA.shn

Transfer 175

TUSC Search #1294
NASA Search #27174

TUSC Search #1296
NASA Search #27180

TB's 73-10393
73-10145

TUSC Search #1295
NASA SP-5043

NASA TB's 73-10211
71-10054
71-10415
71-10417
71-10419
71-10421

NASA Search #27182
January 27, 1975

Mr. Donald D. Grose
Asst. Regional Director for Procurement Assistance
Small Business Administration
Pegion VT
1720 Regal Pow
Dallas, Texas 75235

Dear Mr. Grose:

In reply to your letter of January 8, 1975, the information you have furnished us regarding solar cells as a substitute for conventional energy sources has been very useful, and we are going to venture to build solar panels which will be useful to everyone and economical enough to obtain.

Of particular interest was the information in the NASA TECH Brief B73-10527 on coating aluminum substrates. We would appreciate more information on this, and also information as to whether it would be possible to obtain sheets of this aluminum already coated and what would be involved in commercializing this process.

Sincerely yours,

ORBET, INC.

James A. Poppenberg
Plant Superintendent
Transfer 176
TUSC Search #1316
NASA TB's 72-10058

JAP/nh 72-10090
72-10177
TB's 74-10099 72-10517
73-10484 73-10156
73-10527 73-10374
73-10485 73-10493
73-10524 74-10090

NASA Lit. Search #27386
February 19, 1975

Mr. Donald D. Grose
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose,

Thank you for your letter of February 10, 1975, regarding the information sent to us by Mr. Charles Pierce of your office. The information sent to us by Mr. Pierce has been of great assistance to our engineering staff in evaluating materials for the development of a miniature high voltage power supply, which we expect to market sometime during the latter part of this year. In addition, some of the electronic data supplied by Mr. Pierce is invaluable reference material in assisting us in power supply developments.

We would like to take this opportunity to thank you and your staff for the expeditious manner in which our request have been handled.

Very truly yours,

FILTERLAB CORPORATION

Charles W. Soltis
President

CWS: pj
February 25, 1975

Mr. Donald D. Grose
Assistant Regional Director
for Procurement Assistance
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose:

In reply to your letter of February 10:

The information supplied by Mr. Charles Pierce, Technology Utilization Officer, has been made part of a research file for a new business that we will open the mid part of this year. As you well know, basic research to begin a new business is a costly, time consuming affair. I am of the opinion that the information you have supplied will result in a man-hour savings of 340 hours at a dollar value of $1,600.00. I am most pleased with your help.

Let me, at this time, commend Mr. Pierce for his quick understanding of my requirements and his kind attention to my need.

Sincerely,

Transfer 178
NASA Lit. Search #28005
TUSC Search #1352
NASA Lit. Search #27569

John Ballard
President
April 25, 1975

Mr. Donald D. Grose
Assistant Regional Director
for Procurement Assistance
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose,

Please excuse the delay in answering your letter.

We have reviewed the information you provided and evaluated it thusly.

Solar Energy. The problems that will arise to use solar energy will be severe. First, building codes will have to be changed. Second, even an experimental building will require professional and licensed people. Only large firms will be able to afford the expense. We are not able to use this information.

Electronic Filters. We are using some of the reprints.

Power Supplies. The references were to subjects that were too specific. We will keep these for reference should a particular application arise.

Thank you for your assistance.

Yours truly,

[Signature]

Fahey Widerstrom

Transfer 179
TUSC Searches 1335
1344
April 28, 1975

Mr. S. Charles Pierce
Small Business Administration
1720 Regal Row
Dallas, TX 75235

Dear Mr. Pierce:

I received a letter today from Donald S. Grose, Assistant Regional Director for Procurement Assistance, asking for comments on four searches that you have had performed for us.

We have found the bibliographies provided extremely useful and have ordered copies of reports cited in all of them.

These searches have saved us a considerable amount of time and effort; specifically, I have had the time to search other sources which I would have been unable to do otherwise.

The only problem that I have encountered is in the area of obtaining copies of specific items. For example, in the DDC Search on the liquefied natural gas/pumps, lines, etc. (Search Control No. 026318), I ordered copies of AD 923,390 and AD 923,368 from NTIS since they are unclassified. I received a notice from NTIS stating they are not in their collection and refer to the source of information for availability. I assume this is DDC, but I don't have the required order form. I find it very frustrating to know that information I need exists and is unclassified, but I can't get my hands on it. Can you help me out here? Both reports are pertinent to our study for the U. S. Coast Guard.

I hope that this letter is of some help in your evaluation. Incidentally, I thought that we had filled out and returned the evaluation forms included with these searches. If we missed any, I apologize. We really appreciate your service.

Sincerely,

Mary Ann Mento

Transfer 180
TUSC Searches
1361
1362
1417
June 27, 1975

Mr. S. Charles Pierce
Small Business Administration
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Pierce:

I am sorry to have delayed in responding to your nice letters asking about the usefulness of your service. We have no excuse other than being "just too busy".

The information was very good and we followed a number of the leads and sent for several papers noted in your information resumes. We received a great deal of help from both. It led us to Mr. Dunnegan of Dunnegan Endeco who helped a great deal by referring us to sources of hydro phone made by Gould Industries. We have purchased this equipment and are using it for calibration of our Acoustic Emission Transducers (pickups).

We are now in the process of widening our scope in the AE field and are going to order added material from NTIS which we are sure will be helpful.

Again, we are sorry for the late response and thanks again for your valuable help.

Very truly yours,

E. U. Parsons
President

[Signature]

Transfer 181

TUSC Search 1375
NASA SP-5093
Tech Brief 67-10471
Tech Brief 69-10045
Tech Brief 71-10157
Tech Brief 71-10114
Tech Brief 73-10325
Tech Brief 72-10427
Tech Brief 71-10045
NASA Literature Search 28260
July 29, 1975

Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Attn: Mr. Donald Grose

Dear Sir:

Thank you very much for your letter of July 23, directed to Mr. Blaylock. We certainly appreciate the assistance supplied to us by the Small Business Administration sending us Technical Data regarding to Optical Lenses. This did lend support to us in one area of development project for a new product. The new product is now in a proto-type stage and we should be able to get it into production in the next three months, thus generating hopefully substantial revenues for our Company.

Thanks again for the assistance by the SBA.

Very truly yours,

Robert P. Falconer
Vice-President

Transfer 182
TUSC Search 1440
NASA SP-5941(01)

cc: AB
July 30, 1975

U.S. Government
Small Business Administration
Region VI
1720 Regal Row
Dallas, TX  75235

Subject: Technology Program Effectiveness

Reference: SBA ltr to LH Industries dtd 23 Jul 1975, same general subject.

Attention: Mr. Donald D. Grose
Assistant Regional Director for Procurement Assistance

Gentlemen:

This is to thank you for the assistance Mr. Charles Pierce has rendered to us in connection with the SBA Technology Program. This type of information dissemination is particularly useful to us in evaluating state-of-the-art development.

Your help is sincerely appreciated.

Very truly yours,

LH INDUSTRIES, LTD.
Communications Engineering

[Signature]
Harry R. Lamberth, P.E.
General Manager

Transfer 183
NASA Literature Search 27300
TUSC Search 1310
NASA Literature Search 27283
Small Business Administration
Region VI -
1720 Regal Row
Dallas, TX 75235

Attention: Donald L. Grose

Gentlemen

The response that we received to Mr. Pierce's efforts on our behalf in obtaining information on technology for downhole pumping motor was almost overwhelming. We received response from a number of agencies and organizations. By and large, the responses were prompt and contained much valuable information.

If this case is representative of the results obtained by such efforts, I believe that you can evaluate the effectiveness of your technology program as excellent. It is difficult to estimate the amount of time saved for us by this program.

Unfortunately the financial requirements of this development program are such that we will not be able to immediately act upon the information which we have received. We are, however, actively pursuing methods of financing the program.

We feel that if we are successful in developing the downhole equipment, that it will make a significant contribution to the oil producing industries effectiveness.

I would like to thank your department in general and by carbon of this letter, Mr. Pierce in particular, for doing an excellent job on our behalf.

Yours truly,
Wayne Westerman
Small Business Administration
Regional Office
1720 Regal Row
Dallas, Texas 75235

Att'n: Donald D. Grose

In answer to your letter of September 25, 1975, Mr. Pierce supplied our firm with an article from October issue of Popular Science "Wind Power Without Batteries".

It concerns a new inverter which when used with a DC Power source, does not require storage batteries.

I am at present considering becoming a distributor for this inverter. This would not have been possible, had I not received this article from Mr. Pierce.

I deeply apprreciate all the information you have supplied us with.

Sincerely,

Allen McElvany
President
C-D Electric Motor Sales

AM\jm

Transfer 185
NASA Literature Search 2973
TUSC Search 1488
U. S. Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Attention: Mr. Donald D. Grose

Dear Mr. Grose,

In response to your September 25 letter, I think I can make a general comment that we were "overwhelmed" with material, and have received several follow-ups, both by telephone and written message.

We have effected a barrier and, to a great extent, eliminated the problem we previously reported.

By way of comments pertaining to my evaluation of the program, I can only say that, if anything, it is guilty of "overkill". To eliminate this type of thing, from a taxpayer's viewpoint, I can visualize that with more explicit descriptions of the problem by ourselves, we would have eliminated the tremendous flow of printed material pertaining to actual articles and the voluminous indices of articles available on the subject.

To sum it up, I guess I can state that I was impressed with the response; however, I feel that the system can be refined by requiring a more definitive written description in order to reduce the overall cost of printing, mailing and personal follow-ups on material not required.

I hope my comments can be found beneficial.

Thank you for your interest.

Very truly yours,

TERRY SOUTHWEST, INC.

Carl A. Stendebach
Transfer 186
TUSC Search 1480
NASA Literature Search 29747
July 10, 1974

Small Business Administration
Region VI - PMA Division
1100 Commerce Street
Dallas, Texas 75202

Attn: Donald D. Grose

Subject: Recent research for information regarding manufacturing. Please refer to your letter dated June 7, 1974.

Dear Mr. Grose:

It appears that the information that you recently sent to us will be very helpful.

Within the past several weeks we have hired an engineer to conclude this project; however this may require nine to twelve months.

We appreciate the service you have offered and hope that this will continue to be available.

Sincerely,

CHARLES A. MYERS, Pres.

TUSC Search #1168
NASA Lit Search #25305
2 October 1974

L-74-1346

Mr. Donald D. Grose
Assistant Regional Director
Small Business Administration
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose:

We received your letter of September 3, 1974, concerning our opinion about your service in providing the information of "all types of smoke detectors using ionization chambers or the ionization technique, especially theory of operation and safe levels of radioactive radiation from devices using ionization techniques".

In fact, we are very satisfied with your prompt response and the information from you. The material from you did save us time and effort in finding the information which we are interested in. It led us to a lot of related technical publications and as a result of that, several important decisions were made. We hope that you will provide information to a greater extent in the future.

We would like to express our sincere thanks and wishes for your Technology Program to be a great success.

Sincerely yours,

Robert Zinke
Program Manager

NASA Lit. Search #26248
TUSC Search #1219

RZ:jh
Small Business Administration
Regional Office
1720 Regal Row
Dallas, Texas 75235

Attention: Donald D. Grose, ARD/PA

Reference: Your letter dated October 31, 1974

Dear Mr. Grose:

The only comprehensive response I can make at this time is "WOW". I received at least an order of magnitude more data on EMS systems than I expected and have not had time to effectively review the bulk of it.

Yes, the information received is useful and there is a high probability that it will be used by Technology Incorporated. Perhaps the most useful response I can make is to assure you that I intend to make more frequent use of the SBA information retrieval services in the future.

Sincerely,

Roy W. Thompson
Associate Principal
Research Engineer
San Antonio Laboratory

TUSC Search #1269
NASA LIT. Search #26832

RWT/slj
October 4, 1974

Mr. Donald D. Grose
Assistant Regional Director
for Procurement Assistance
Small Business Administration
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose:

In response to your inquiry regarding the technical search and assistance program, I must say we are delighted. We are a technically oriented company. However, being a small business constrains our ability to acquire new technology in our areas of activity. Most of our time is spent on day-to-day problems.

The Technology Utilization Program provides an access to new technology with very little initial effort by the participating small business. All literature received is not always right on target, but some of it is, and further effort by Mr. Pierce has brought good results.

Mr. Pierce has been aggressive and efficient in his duties. His response to our needs and inquiries has been excellent.

We are very interested in the program's continuance. Keep up the good work.

Sincerely,

J. B. Huddleston
Vice President - Operations

JBH:mae

NASA SP-5071
TUSC Search #1246
NASA Lit. Search #26861
September 25, 1974

Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas  75235

Attention: Donald D. Grose, ARD/PA

Dear Mr. Grose:

The aid and assistance given to us by Mr. Charles Pierce, of the Technology Utilization program, has indeed been most impressive and efficient. I do not mind admitting that I made my request for the desired information with some reservation, knowing full well that in the past, somewhat similar programs had not been too satisfactory for us. But in this case, the information came to us quickly, well documented, and efficiently screened and surveyed.

We are still working with the material, and it looks like it will be most helpful to us. Please express my appreciation to Mr. Pierce and thank all concerned for their assistance.

Sincerely,

John S. Forrester
SCIENTIFIC SYSTEMS CORPORATION

TUSC Search #1288
NASA Lit. Search #26171
TUSC Search #1222
NASA TB's 71-10090
               71-10536
               65-10390
               72-10526

JSF/ph
October 21, 1974

Mr. S. Charles Pierce
Small Business Administration
1720 Regal Row
Dallas
Texas 75235

RE: Liquid Crystals and Micro-Processors Information

Dear Mr. Pierce:

My sincere thanks for the mass of information you sent me on the Liquid Crystals and Micro-Processors. The amount of data referring to the various reports was far more extensive than I had anticipated, so needless to say it will take quite a while for me to sift through the computer print-outs and pick the reports or papers most relevant to our problems.

Thanking you again for your cooperation in this matter and looking forward to being in touch with you in the near future for further assistance.

Sincerely,

K. Mirdadian
President.

TUSC Search #1243
NASA TB's 72-10746
72-10083
72-10183
NASA Lit. Search #26629
NASA Lit. Search #26621
TUSC Search #1250
NASA TB's 70-10599, 70-10581
October 21, 1974

Dear Mr. Grose,

Thank you very much for your letter of September 3, 1974. I do apologize for the long delay in answering. We have been pretty well snowed around here.

The materials which we received from your office have been interesting and informative. They have also allowed us to look indifferent directions for solutions to our various problems. However, in so far as immediate, concrete answers are concerned, we have not been able to find them.

We are familiar with the majority of the materials available to this day. And, without sounding smart, U. S. Gypsum offers very little more than we already know about their products.

Unfortunately, available information in our area of interest, seems to be rather scarce.

In so far as this SBA service is concerned, I must say that it is very efficient and valuable. Please keep it up. It is one of the few areas nowadays in which we can see some return from our tax dollars.

Cordially,

S.J. Doggett

NASA Lnt. Search #26327
TUSC Search #1228
NASA TB's 63-10008, 64-10270, 65-10177, 66-10328, 67-10302, 70-10403, 70-10512, 70-10019, 70-10273, 72-10234, 72-10175, 71-10063
NASA SP-5044

RECEIVED

OCT 27 1974
REGION VI - FT. W
November 11, 1974

Small Business Administration
Region VI, 1720 Regal Row
Dallas, Texas 75235
Attn. Mr. Donald D. Grose
Assistant Regional Director for Procurement Assistance

Subject: Information on High Voltage Power Supplies, lowering X-ray dose to Patient, and use of Neutron Radiography in the Medical Field.

Dear Mr. Grose:

The efforts of the Small Business Administration, Dallas Regional Office, have once again provided I.T.M. with extremely helpful Information.

The references supplied were so numerous, that we are still engaged in the follow up of these leads. Contacts were made, which show great promise; as was our office contacted by known experts commenting on their experience in related fields.

Please accept our sincere thanks for your invaluable contribution to our program and also please transmit our thanks to Mr. Charles Pierce who as usual has done an excellent job in helping us in solving our problems.

Very truly yours

Karl Senghaas
Vice President, I.T.M. Inc.

TUSC Search #1278
NASA Lit. Search #26896
NASA Lit. Search #26847
TUSC Search #1285
NASA Tech Briefs 69-10344
72-10232
TUSC Search #1277
NASA Lit. Search #26875
July 29, 1974

Mr. Donald D. Grose
Assistant Regional Director
U. S. Small Business Administration
1100 Commerce Street
Dallas, Texas 75202

Dear Sir:

I wish to apologize for delaying an answer to your letter of June 7, 1974, regarding our utilization of information supplied by Mr. Charles Pierce of your office.

Both Mr. Hemphill and I read the material and consider it a valuable addition to our technical library. It is hard to pinpoint any specific material that is of more importance than any other. Rather we consider the best use for the material, to date, is keeping us updated on the state of the art, and advances being made in drilling and water well technology.

We value this material, and hope you will keep us on your mailing list.

Yours truly,

C. Howell Mullis, Jr., Ph.D., P.E.
Chief Engineer

CHW/smj  TUSC Search #1177
NASA Lit. Search #25312
TUSC Search #1182
NASA Lit. Search #25320  NASA Lit. Search #25325  TUSC Search #1176

RECEIVED
AUG 2 1974
REGION VI - PMA
Mr. Donald D. Gross  
Small Business Administration  
1720 Regal Row  
Dallas, Texas 75235  

Dear Mr. Gross:  
In reply to your letter of September 3rd, relating to information sent to us by Mr. Charles Pierce, concerning protective epoxy and resin coatings, the information is so voluminous that I have not had time to go through all of it. I have found a number of technical bulletins that I need to order, as the research applies to our type of work.  

As I mentioned to Mr. Pierce, small companies like us do appreciate the availability of this extensive research for our own use. I am still studying the information that was sent to us and I really do appreciate it.  

Yours very truly,  

H. R. Haines,  
President

HRH:ah

NASA Lit. Search #26297
TUSC Search #1229
NASA TB's 67-10149  
65-10140  
64-10206  
66-10207  

97
Mr. Donald D. Groce  
Assistant Regional Director  
for Procurement Assistance  
Small Business Administration  
Region VI  
1720 Regal Row  
Dallas, Texas 75235

Dear Mr. Groce:

The cooperation of the Small Business Administration is greatly appreciated by our firm. The information supplied through the efforts of Mr. Charles Pierce and his colleagues is presently being utilized in our laboratory research and development program, and will enable us to provide better services to our clients.

Thank you, again.

Sincerely yours,

Harris A. Lichtenstein, Ph.D.  
President

*  
NASA SP-5021 (11), (12), and (13)  
Index to NASA Tech Briefs 1970  
Index to NASA Tech Briefs 1971  
Index to NASA Tech Briefs 1972  
NASA Lit. Search #26638  
TUSC Search #1255  
NASA Lit. Search #26662  
TUSC Search #1253  
NASA TB's 73-10406, 72-10207, 67-10243, 70-10525  
TUSC Search #1252
October 9, 1974

Mr. Donald D. Grose
Small Business Administration
Region VI - PA Division
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose,

In response to your letter of October 1, 1974, we wish to express our appreciation for the prompt action taken by your administration in supplying us with many references and articles pertaining to product developments, about which we had requested information. This information should prove to be very useful to us.

Very truly yours,

P.C. Sundt

PCS:slh

NASA Lit. Search #26622
TUSC Search #1258
NASA Lit. Search #26652
TUSC Search #1261
TUSC Search #1245
NASA TB's 63-10551, 66-10085
NASA Lit. Search #26664
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235
Attention: Mr. Donald D. Grose

SUBJECT: Inquiry as to Effectiveness of Technology Program

Dear Mr. Grose:

The program activated by Mr. Pierce in our behalf was found to be most effective. It can be stated now that the material received under the sponsorship of the program saved us considerable basic research efforts and permits us to concentration developmental activities. Please be aware that the program execution here is of rather low profile and long range.

Thanking your office for the assistance, I remain,

Sincerely,
ROTHE DEVELOPMENT INC.

W. E. Rothe
President

NASA Lit. Search #26831
TUSC Search #1282
October 2, 1974

S. Charles Pierce
Technology Utilization Officer
Small Business Administration
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Pierce:

Our company was very pleased with the assistance provided by the Small Business Administration Office. Unfortunately we did not find the CO₂ sensor indicated, but we feel your office did as thorough a job as possible.

Sincerely,

W.G. Mondshine
Operations Manager

WGM:jdm

NASA TB72-10168
TUSC Search #1161
NASA TB 72-10198
NASA TB's 72-10420
65-10316
64-10259
64-10319
69-10092
65-10390
72-10207
72-10402
73-10381
72-10526
February 13, 1975

U. S. Government
Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose:

We wish to thank you and your organization for the excellent manner in which they prepared the literature search on solar energy and wind energy for our company. The abstracts are very complete and has undoubtedly saved the company considerable manhours.

Give my regards to Charles Pierce and thank him for the splendid job. I will be needing his assistance at a later date.

Yours truly,

E. F. Jernigan
Vice President
TEXAS CARBIDE Mfg., Co.
February 13, 1975

Mr. Donald D. Grose  
U.S. Government  
Small Business Administration  
Region VI, 1720 Regal Row  
Dallas, Texas 75235

Re: Your Letter of 2/10/75

Dear Mr. Grose:

The information supplied to us on Solar Energy has been of value. We are trying to build up files and knowledge for future projects.

We did get some information in areas of little interest, and much of the information was just a lead as to where to start looking.

Communication is frequently a problem in all areas of business. We do feel that if we had communicated our interest in more detail that we could have saved you some work and narrowed the amount of information we had to sort through.

We think it is a good program and should be continued. Better communication between our needs and just what service and/or information you can supply could improve the value of this service.

Sincerely,

Joseph F. Frantz  
President
21 March 1975

Mr. Donald D. Grose
Assistant Regional Director
for Procurement Assistance
Small Business Administration
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Grose:

In response to your letter, I would have to evaluate the results of the Technology Utilization Program as only partially successful so far. I attribute this to several reasons.

For one, the technology information offered by sources (NASA, Battelle) was not as recent as I was obtaining through a patent literature research and vendor product brochures. It seems the really good information is available after it is patented and ready to be marketed.

Also, when I asked for information, I had already eliminated several branches of associated work as being not feasible. Your department's work was very broad, and I was already down to a very narrow point.

But let me add that Charles Pierce was very enthusiastic, obtained a lot of information in a hurry, and it was information that filled a lot of gaps in my knowledge at a great savings in cost and time to me as a small business.

I would use the service again, but I would try to use it to help me define a technology I know absolutely nothing about. In other words, let the literature help me in finding branches of the technology that would help me rather than eliminating literature references that are not in the branch I have already chosen.

Sincerely yours,

Porter B. Click, Jr
Director of Technology
March 31, 1975

Mr. F. Charles Pierce  
Technology Utilization Officer  
U. S. Government Small Business Administration  
Region 6  
1720 Regal Row  
Dallas, Texas 75235  

Dear Mr. Pierce:  

Please excuse the delay in replying to your letter of February 27th and Mr. Grose's letter of January 8. The information you supplied for our study of filtration systems was most helpful. We still have not found a solution for the removal of CO but the technical information your office furnished was very comprehensive and saved us a lot of time in evaluating our project.  

Thanks again for your effort on our behalf.  

Very truly yours,  

WESTPORT GROUP, INC.  

AJH/re  

NASA Literature Search
October 22, 1975

Mr. S. Charles Pierce  
Small Business Administration  
1720 Regal Row  
Dallas, Texas 75235

Dear Mr. Pierce:

I sincerely appreciate the assistance that you have given us on our request for information on hydro-mulch material.

I will be writing Vance Setterholm of the U. S. Forest Products Lab. in Madison, Wisconsin and also the Paper and Pulp Industry in Atlanta and the Paper Stock Institute in New York City for additional information. I have ordered several documents from the National Technical Information Service from the book that you kindly sent to us. The booklet which was on loan to us has been returned under separate cover.

Thanks once again for your help in this matter.

Yours very truly,

AMXCO, Inc.

W.E. Johnson  
Vice President

TUSC Search 1561
October 30, 1975

Donald D. Grose
Assistant Regional Director
for Procurement Assistance
1720 Regal Row
Dallas, TX 75235

Dear Mr. Grose:

I appreciate very much Mr. Charles Pierce's information and service. The information has been useful and I do plan to use it in the future. Since Solar Energy is certainly in its infancy, in so far as practical application to homes are concerned, I am sure you will understand that it will take a while for us to absorb the information; and even more time to determine its actual practical application. I hope we can start using existing technology within a year.

We also will no doubt be in touch later as plans for Solar Energy use can be made to insure that we have the latest technology.

Thank you for your interest.

Sincerely yours,

Terrance C. Buchanan
Rex Rogers Construction Co

TUSC Search 1126
TUSC Search 1460
9 Tech Briefs
Mr. Donald D. Grose,
Asst. Regional Director,
S.B.A., Region VI,
1720 Regal Row
Dallas, Tx. 75235

Nov. 1, 75.

Dear Mr. Grose,

Thank you for your letter dated Sept. 25, 75. We feel that Technology utilization service is very useful. This program saves money and time for small businesses.

The technical paper we received on Friction on sliding supports helps us to understand this topic better. We believe this information will be useful to us.

I would be failing in my duty if I do not mention about the very prompt attention we received from Mr. Charles Pierce. He is very helpful.

We hope that we would continue to receive this help from your department in the future also.

With Best regards,

S. KANNAPPAN

S. KANNAPPAN

TUSC Search 1496
NASA Literature Search 29748
          "        29939
          "        29743

ORIGINAL PAGE IS
OF POOR QUALITY
19 September 1975

Mr. S. Charles Pierce  
Small Business Administration  
1720 Regal Row  
Dallas, Texas 75235

Dear Mr. Pierce

The information you have supplied us on the non-invasive physiological monitoring devices has been extremely helpful.

As you know, this is only one of several times we have called on you for help. Each time, the results have been very rewarding.

We thank you, your staff and those agencies who have so willingly helped us.

Keep up the good work -- thank you again.

Sincerely,

T. Gerald Stafford/
Manager  
San Antonio Laboratory  
Life Sciences Division

TGS/slj

TUSC SEARCHES 1517-1530
October 2, 1975

U. S. Government Small Business Administration
Region VI
1720 Regal Row
Dallas, Texas 75235

Attention: Mr. Donald D. Grose

Reference: Your Letter of September 25, 1975
Geothermal Energy Resources

Dear Mr. Grose:

I have received your literature with great enthusiasm and have surveyed it as to our useful application of the information. We think that geothermal energy has great potential in the field of heat source for absorption refrigeration systems in chemical industry.

As of the present time, we do not have a specific application to apply this information or technology, but we are looking forward to working with your office and possible potential customers in the future. We do appreciate your effort on our behalf, and do feel that your information is most informative and quite helpful technically.

When we do develop a specific application for its use, we will more than likely be back in touch with your organization in order to provide ourselves of any additional or up to date information available.

Thank you very much for your help in this matter.

Sincerely yours,

James J. Shepherd
Vice President
Manager Central Division

JJS/cmb  TUSC Search 1479
NASA Literature Search 29740
January 5, 1976

Mr. Augie Moore
Technology Use Studies Center
Southeastern Oklahoma State University
Durant, OK 74701

Dear Augie:

Enclosed are three SBA Forms 487, representing five case studies, and letters of evaluation resulting from information furnished to TU clients by this office. A search and/or other technical information from TUSC was a part of the information furnished in each case.

Thanks again for your part in making the TU Program a success in our area.

Sincerely,

S. Charles Pierce
Technology Utilization Officer

Enclosures

NOTE:
Approximately 10-12 other SBA forwarding letters of similar content were received during the contract period.
June 4, 1975

Mr. S. Charles Pierce
Small Business Administration
1720 Regal Row
Dallas, Texas 75235

Dear Mr. Pierce,

In response to a letter from Mr. C. Henry Gold of Southeastern Oklahoma State University, I have searched our inventory for programs that apply to inventory control. Unfortunately, we do not have any programs for this application that would be suitable for you, (i.e., written in either basic or assembler code and implementable on a mini-computer).

I regret that we cannot be of help to you in this regard, but perhaps the enclosed abstracts will be of interest to you in your efforts to develop theatrical lighting systems.

In any case, if I can be of assistance, please do not hesitate to call.

Sincerely,

Ron English
Customer Services

RE: jag
Enclosures

cc: C. Henry Gold
May 28, 1975

Technology Use Studies Center
Southeastern State College
Durant, OK 74701

Gentlemen:  Attention:  Mr. Bill Dodd

I appreciate very much the work you put into researching the subject of "Purification of Industrial Waste Water Containing Inorganic Solids".

Even though, after reading the material, I didn't come out with a specific course to follow, the material was very broadening and informative and gave me insights into things we could try.

Again, thanks very much for your help.

Sincerely,

[Signature]

Alan M. Curry
Quality Control Supervisor
June 9, 1975

Mr. Alan M. Curry
Quality Control Supervisor
Johns-Manville Products Corporation
Denison, Texas 75020

Dear Alan:

Thank you for your letter of May 28. The information on purification of industrial waste water was mailed to you at the time I was attending a NASA conference at Langley Field, Virginia. We hope the information will be of value to add to your resource or library file.

I mentioned to you that we would also do a search concerning the problem of lowering pH in industrial waste water. We were not too successful in locating specific reports on the subject of pH; however, we are sending one abstract, report N68-22975 for your review. If you would like to have the report, we can assist you in obtaining a copy of it. As additional information, we are also sending two special reports on water treatment; they are quite extensive and cover most aspects of the treatment of water. This material is being mailed under separate cover.

Both Frank Wade and I enjoyed your visit. Please feel free to call on us if we can be of assistance.

Sincerely,

Bill Dodd
Industrial Specialist

ORIGINAL PAGE IS OF POOR QUALITY
May 20, 1975

Small Business Administration
1720 Regal Row
Dallas, TX  75235

Attn:  Mr. S. Charles Pierce

Gentlemen:

I would appreciate help in exploring the possibility of developing a new type prime mover for operating subsurface fluid pumping equipment used in oil production.

The basic concept employs a DC, reversible electro-magnet solonoid attached to the pull tube of the pump. When current of one polarity is applied, the solonoid rod is retracted pulling the pump up. When current of the reverse polarity is applied, the solonoid rod is extended forcing the pump plunger down.

The solonoid is connected to the surface by an electrical conductive, insulated cable which serve both as conductor as well as mechanical transport for the solonoid and the pump.

General specifications as follows
1.  Length of stroke  minimum of 12 inches (longer if possible).
2.  Maximum length of solonoid  35 feet.
3.  Maximum OD of solonoid 1.75 inches.
4.  Pull tube diameter from 1/2 to 1 inch OD.
5.  Solonoid pull (minimum) 5000 PSI
6.  Solonoid cycle rate  120/minute (maximum)

Any information on existing equipment, technology or design data will be greatly appreciated.

As we mentioned in our conversation this date, we are starting a new industrial electronics supply house  Any trade association information or other input will also be appreciated.

Yours truly,

Wayne Westerman

WW:an
It was suggested by the Electronics Department of Southeastern Oklahoma State University that a segmented solonoid be used, each section having its own coil. This should be used in conjunction with a linear commutator that would allow the solonoids to maintain their forward momentum. An electromechanical engineer should be able to design the necessary circuits and equipment. If this design is not applicable, please let us know.

Edward Pruitt
Information Retrieval Assistant

June 1975

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Segmented Series Solonoid

Linear Control Commutator

As solonoid 1 reaches the peak of travel, then solonoid 2 starts forward, and so on down the line. This will maintain the forward momentum.
June 20, 1975

Technology Use Studies Matter
Southeastern Oklahoma State University
Durant, OK 74701

Attn: A. M. Moore
Subject: Search No 1466 Case No. 065-8
Title: Prime Mover Using a DC Reversible Electro-magnetic Solonoid

Gentlemen:

Thank you for your correspondence dated June 5, 1975 received June 16, 1975. The suggestion of the electronics department of Southeastern Oklahoma State University that a segmented solonoid be used sounds very good. We would appreciate having design data for designing the solonoid itself. While our design capabilities include electronic analog and digital circuits, we have no experience in solonoid design.

Any information that you could provide to us on this subject would be greatly appreciated.

Yours truly,

G. Wayne Westerman

GWW:an

cc: S. Charles Pierce
    Small Business Administration
    1720 Regal Row
    Dallas, TX 75235

    TUSC Search 1502
    Tech Brief 69-10704
    3 STAR Abstracts
    STAR Index-"Solonoid/valves"
OKLAHOMA ASSOCIATION FOR AFFIRMATIVE ACTION

Officers

President: Walter O. Mason, Affirmative Action Officer
University of Oklahoma
660 Parrington Oval
Norman, OK 73069

Vice President: Bill Dodd, Affirmative Action Officer
Southeastern Oklahoma State University
Durant, OK 74701

Secretary: Ellen Cole, Project Specialist
Affirmative Action Office
University of Oklahoma
660 Parrington Oval
Norman, OK 73069

Treasurer: Pauline Kopecky, Director of Affirmative Action
Oklahoma State University
Whitehurst Hall
Stillwater, OK 74074

Director: Virginia Farmer, Director of Equal Employment Opportunity
Oscar Rose Junior College
6420 SE 15th
Midwest City, OK 73110

Director: William Lee, Director of Counseling
Cameron University
2800 Gore Blvd.
Lawton, OK 73501

Director: Wayne Day, Chairman, Affirmative Action Committee
Seminole Junior College
P. O. Box 351
Seminole, OK 74848

Committees

Membership: Betty R. Jackson, Vice President for Teaching
Claremore Junior College
College Hill
Claremore, OK 74017

Program: Larry Williams, Director of University Personnel Services
Central State University
100 North University Drive
Edmond, OK 73034
FISH UTILIZED IN WASTEWATER RECLAMATION SYSTEM

A new wastewater purification system now being developed at Durant, Okla. will utilize aquatic plants and rough fish, including carp, suckers, catfish, shad, crawfish, and fresh water mussels and clams. The water reclamation plant is patterned after a system that has been used successfully by the Bavarian Power Co. in Munich, Germany for the past 25 years. The Chinese used similar systems as far back as 400 B.C.

Wastewater from Durant's existing primary and secondary treatment facility (after the standard filtration process) will run through a series of six lagoon ponds where fish will eat the nutrients and shellfish will lower the concentration of organic matter. It is estimated the ponds will handle 1.5 million gallons per day. The water will be held for 72 hours before it is released into nearby Mineral Bayou, and then into two rivers. Officials say the towns located downstream should receive potable water capable of meeting the U.S. Environmental Protection Agency standards that go into effect in 1978.

An old refining building has been converted into a fish hatchery. Over 3000 lbs. of fish are now available, which is about 10% of the capacity of the lagoon system.

A biology professor at Southeastern Oklahoma State University in Durant, Dr. Frank Wade, drew up the plans for the new low-budget system, much of the work was done by biology students. Officials consider it a pilot project which they believe will have application for other municipalities with a population of 15,000 or less.

For more information, contact Bill Dodd, Industrial Specialist, Technology Use Studies Center, Southeastern Oklahoma State University, Durant, OK 74701.
New Water Treatment Plan Viewed By College Trustees

By JAMES BURNS
Herald Staff Writer

A lagoon system for waste disposal, described as "nature's way" of treating water, was outlined to Grayson County College trustees at a board meeting Tuesday night.

Dr Frank Wade of Southwestern Oklahoma State University told GCC board members the lagoon treatment system such as one in operation in Durant is less expensive, easier to maintain and more natural than conventional sewage disposal methods.

"The system duplicates what a creek or pond system does (in cleaning water)," Dr Wade said.

Following the hour-long presentation in the college's administration building, trustees agreed to form an ad hoc committee to investigate the possibility of such a facility at Grayson County College.

Under the innovative waste disposal plan outlined Tuesday, several one-acre lagoons and a small catch basin would be constructed on a hillside near a west parking lot on the main campus. Waste water from the college's present treatment plant would be pumped to the uppermost lagoon. The water would then be filtered in each lagoon and naturally cleansed as it passes from one basin to the next. Following its treatment, the water could be released into a small creek which flows through the campus.

Cost of the lagoon treatment system is estimated at $42,000. Although no EPA funds are available for construction, Dr Wade said the facility would be considerably cheaper than its alternatives. For example, connection with Denison's sewage system could cost the college approximately $200,000, he said.

The college is currently seeking a new waste disposal method due to more stringent regulations formulated by the Environmental Protection Agency. Although the school's treatment system meets present EPA guidelines, new restrictions, in effect July 1, 1976, are forcing the college to investigate more efficient methods, according to GCC President Truman Wester.

Other possibilities mentioned by Dr Wade include construction of a new chemical-mechanical treatment system or connection with the Denison system. Both of these alternatives are considerably more expensive and might not be completed in time to meet the 1976 EPA standards, the OSU scientist pointed out.

One drawback to the lagoon system is the uncertainty of its approval by the federal environmental agency, Dr Wade said. The EPA does not guarantee approval of each and every system constructed but checks them individually, he explained. The agency has, however, already approved some lagoon facilities, including a large system in Oklahoma City, Dr Wade noted.

"It's a gamble, but you're gambling with fewer dollars and I think it's a safer gamble," he said. Even without EPA approval of the college's lagoon system, it could be blended in with more conventional disposal methods, he added.

In addition to its lower cost, the lagoon system has several advantages, according to Dr Wade. These advantages include the ability to irrigate the entire campus in summer months, commercial fish breeding, elimination of an ugly treatment plant, and involvement in the project of several college classes.

The ad hoc committee approved Tuesday will investigate the lagoon system and present the proposal to the EPA, Texas Water Quality Board and the Grayson County Health Department.

In other action at the GCC board meeting, trustees:

-approved a resolution opposing a policy proposal in regard to tenure, academic freedom and faculty responsibility in Texas universities and colleges.

-discussed proposed changes in requirements for instructors in nursing programs.

-approved college participation in a renovation project to be funded with $332,500 in federal funds and requiring a 20 per cent GCC match.

-gave final approval to two chapters of the new board policy manual and received a section on educational programs to be considered at the December board meeting.

-recognized Mrs Jessica Russell, new journalism instructor, and Dr David Petrascheck and Gerald Locke, GCC nominees for a Piper Foundation award.

-and approved monthly bills totaling more than $117,000.

LAGOON DISCUSSION—Dr Frank Wade of Durant discusses the merits of a new waste water treatment method with GCC board members Tuesday. As outlined by Dr Wade, the method, which uses several lagoons to clean waste water, is inexpensive and maintenance free. (Herald Photo)
Southeastern commits for Community Service

MINE SAFETY—The large blue and white bus that travels from its campus headquarters to mine sites all over southeastern Oklahoma is a complete multi-media classroom on wheels. The classroom provides mandatory safety training to coal miners.

Jim Adcock, Coordinator of the program explained how to get started. "The program was two years in the planning stage and is federally funded, administered by the State Chief Mine Inspector of Oklahoma and implemented by Southeastern."

Ward Padgett, State Chief Mine Inspector, worked with Adcock on the program. "Until now, the total responsibility for all federally required safety training has been with mine inspectors in addition to their regular monthly mine inspections on all coal mines in Oklahoma."

Out on the open road the mobile training unit will be headed by Ron Abner from Southeastern. "Included in our curriculum are video tapes of actual mine operations and simulated mine accidents. These will be used to help teach mine safety and first aid."

"We have to work in compact time periods," Abner emphasized. "So this won't be a regular classroom situation. Miners will use push button consoles to register answers to questions asked throughout each class period. Then the instructors can immediately tabulate right and wrong answers. This helps us evaluate how effectively we're teaching."

In preparation for the program, Abner spent time touring Oklahoma coal mines with the state mine inspectors. "All miners I met were receptive to the training program we'll offer. The potential hazards of their jobs constantly remind them that it pays to learn."

One such mining hazard is the methane gas that goes hand-in-hand with coal mining. "There is always the possibility of mine explosions in underground mining," Abner explained. "While most of Oklahoma's mining is above ground, there are a number of underground coal mines that may be worked in the near future."

Counties that will be serviced by the new classroom on wheels are Craig, Nowata, Rogers, Mayes, Tulsa, Wagoner, Okmulgee, Muskogee, McIntosh, Sequoyah, Haskell, Latimer, LeFlore, Pittsburg, Coal and Atoka. All training sessions at mine locations in these counties will be arranged by the state mine inspectors with coal mine operators.
October 22, 1974

Dr. Lawrence Weller
Cincinnati Electronics (Dept. 515)
2630 Glendale-Milford Road
Cincinnati, Ohio 45241

Dear Dr. Weller:

In response to your recent inquiry requesting a list of our available publications and reports, TUSC information retrieval personnel use various resource publications. Those most frequently used are Scientific and Technical Aerospace Reports (STAR), International Aerospace Abstracts (IAA), and U. S. Government Research and Development Reports (USGRDR).

The Center also subscribes to various professional publications related to technical matters, such as The Welding Journal, Modern Plastics, Electronics, Oil & Gas Journal, etc.

We would be pleased to conduct a search or searches for you, since we have access to numerous electronic research reports. In addition, TUSC employs an electronics graduate student who functions as an information retrieval assistant.

Thank you for your inquiry. We hope to be of service to your firm in the future.

Sincerely,

C. Henry Gold, Director
Technology Use Studies Center

CHG/sgw
November 12, 1974

Ms. Jody Rubenstein  
Serials Clerk, Fondren Library  
Southern Methodist University  
Dallas, Texas 75275

Dear Ms. Rubenstein:

Thank you for your letter of November 8 requesting TUSC "Bulletins." This publication is our annual report which is printed usually in the month of June or July of each year. We will be happy to forward these reports to you.

Thank you for your interest in the information dissemination service provided by this Center.

Sincerely,

C. Henry Gold  
Director

CHG/sgw
January 27, 1975

Mr. F. William Koop
Executive Office of Water Resources Research
U. S. Department of Interior
18th and E Streets, Room 5413
Washington, D. C. 20240

Dear Mr. Koop:

I am most pleased to hear about Mr. Dodd's recent telephone visit with you, and we do extend an open invitation to you and/or your field personnel to visit the Durant/Southeastern water treatment facility. The enclosed material will provide you with background information about Dr. Wade's project. (The last page is a sketch intended to show a general view of the wastewater treatment facility in relation to the City's sewage facility.)

The water treatment system is envisioned as a pilot project especially suited to populated areas of 15,000 and under. The overwhelming cost of a properly engineered and mechanically equipped water treatment plant is simply beyond the budgetary constraints of a small community. As you know, the past approach to the water quality problem has been to release effluents into a stream or river; then hope for dilution—it has not worked and it gets worse with the passage of time. The new EPA Standards prohibit the practice; thus, an alternative, inexpensive method must be researched and developed. The Durant projects presents a viable, timely, and needed alternative—the quality of water is vastly improved and the system is well within the economic constraints previously mentioned.

Dr. Wade is set up to accomplish valuable research in this particular area or aspect of water quality, and we would indeed welcome the opportunity to work with the Water Resources Research Office of the Department of the Interior. I am confident that Dr. Wade has the partial answer to a pressing national problem.
January 27, 1975

Thank you for your interest. Any assistance you can render will be greatly appreciated.

Sincerely,

Leon Hibbs
President

cc: Speaker Carl Albert
Technology Use Studies Center  
Southeastern Oklahoma State University  
Durant, Oklahoma 74701

Re: In-House Search Request  
Search Number 1570  
Dated - September 29, 1975

Gentlemen:

You requested information relative to the usefulness of the material furnished on the above search and it appears that the information will be very helpful. We are continuing to study this material and if we have comments after that time, we will contact you again.

Thank you for your help.

Yours very truly,

HALL TANK COMPANY

Richard D. Hall

RDH:pgc
APPENDIX D

GENERAL AVIATION NEWS LETTER
DEPARTMENT OF THE AIR FORCE
AIR FORCE RESERVE OFFICERS TRAINING CORPS
MAXWELL AIR FORCE BASE, ALABAMA 36112

REPLY TO
ATTN OF: JRC-5

FEB 12 1975

SUBJECT: Distribution of TUSC News to AFJROTC Units

TO: Technology Use Studies Center
Southeastern Oklahoma State University
Durant, Oklahoma 74701

Gentlemen:

Reference our telephone discussion with your office on 4 Feb 1975. As per our telephone agreement we would like to place the 263 Air Force Junior ROTC Units on your mailing list for the TUSC News. Attached is a listing of all AFJROTC Unit addresses.

The High School Curriculum Division is responsible for providing educational materials to 263 Air Force Junior ROTC Units involving 32,000 students. We are continually searching for new publications which offer current information concerning Aerospace Education. The AFJROTC Aerospace Education Curriculum is heavily oriented toward aviation. TUSC News is an excellent publication and would enable instructors and students alike to remain abreast of current aviation research and developments.

We appreciate your assistance in this matter. We are confident that your publication will be a valuable additional resource at every school hosting AFJROTC.

James A. Elmer, Lt Colonel, USAF
Chief, High School Curriculum Division
Directorate of Junior Program

128
Strength Through Knowledge
Mr. A. M. Moore, Editor
The TUSC News
Southeastern State College
Durant, Oklahoma 74701

Dear Mr. Moore:

We have recently received Volume II, Number 1, General Aviation - Technical Edition. Please send the publication by Paul L. Vegas entitled "A Detailed Procedure for the Use of Small-Scale Photography in Land Use Classification, NASA TN D-7542", which is shown on Page 3.

Also, please send us NASA TN D-7666 which concerns intermingling STOL traffic with normal traffic.

Sincerely,

C. E. Nilson, Administrator
Safety & Inspection Section
Bureau of Aviation
DIVISION OF MASS TRANSIT OPERATIONS

ENCLOSURE
July 15, 1974

The TUSC News
General Aviation - Technical Edition
Technology Use Studies Center
Southeastern State College
Durant, Oklahoma 74701

Dear Sirs:

Would you please add the following names to your mailing list to receive the General Aviation Technical News Letter. Thank you very much.

Mr. Stephen Daley
511 Greenwood Avenue
Apt. C-2
Glenside, Pa. 19038

Mr. John Gephart
524 East Main Street
Lock Haven, Pa. 17745

Mr. Charles D. Gilmore
P.O. Box 492 B
R.D.#1
Mill Hall, Pa. 17751

Dr. Marcus Konick
Director Academic Services
Lock Haven State College
Lock Haven, Pa. 17745

Mr. Richard Lutey, Jr.
2526 Riverview Place
Elkhart, Indiana 46516

Mr. Victor Marchioni
R.D.#2
Williamsport, Pa. 17701

Mr. David Seamans
1035 Foxhill Road
State College, Pa. 16802

Mr. Richard S. Terrill
R.D.#1
N.A. 28
New Alexandria, Pa. 15670

Sincerely yours,

(Miss) Evelyn N. Sedivy
Director, Aviation/Aerospace Workshop, Lock Haven State College
July 16, 1974

Mr. A. M. Moore, Editor
General Aviation Technical News Letter
Technology Use Studies Center
Southeastern State College
Durant, Oklahoma 74701

Dear Mr. Moore:

I have replied under separate cover to your letter of June 26, and I have indicated that I do want to be placed on your mailing list. I am most appreciative to you for making your services available.

I noted in your letter that you conduct literature searches for persons receiving the newsletter. The June issue makes reference on page five to a NASA Technical Memorandum entitled "Feasibility of Space Disposal of Radioactive Nuclear Waste" (NASA TM X-2912). If your services include making a copy of this publication available, I would be most appreciative if you could have a copy sent to me.

Yours truly,

J. WAYNE PYRON, Coordinator
Satellite Technology Demonstration

JWP/es
The TUSC News
Technical Use Studies Center
Southeastern State College
Durant, Oklahoma  74701

ATTENTION:  A. M. Moore, Editor

Gentlemen:

Some time ago we received the first General Aviation Technical News Letter which was addressed to our Mr. A. V. Mundt here at the College of Education.

We have not received any other News Letters since this first one published in June, and Mr. Mundt is wondering if you got the request slip he returned stating he wished to be included on your mailing list. In the event he is not on your list, he would very much appreciate receiving any forthcoming issues at the following address:

MR. A. V. MUNDT
Learning & Resource Center
College of Education
University of Nevada
Reno, Nevada  89507

Thank you for checking into this for us.

Very truly yours,

NORMA R. COWLISHAW
A/V Librarian
Learning & Resource Center
College of Education
March 4, 1975

Mr. A. M. Moore, Editor
Technology use Studies Center
Southeastern Oklahoma State University
Durant, Oklahoma 74701

Dear Mr. Moore,

Recently I had the opportunity to read a copy of the TUSC News on General Aviation - Technical Edition. I found it very interesting and directly related to the Aeronautics offerings at SJSU.

I would appreciate being placed on your mailing list for the publication. Would it be possible to receive issues prior to the Vol. II, Number 3 December 1974 edition? Please advise if there are any charges for the publication.

Respectfully,

N. M. Milichevich

NMM:cs
Dear Mr. Moore,

A friend who is a professor at Pepperdine University kindly sent a copy of your February 1973 newsletter. While this is dated material the Aerial Applicators article is of special interest to me since I teach Agricultural Aviation at Bakersfield College.

Would you please put me on your mailing list to receive your fine little Aviation Technical News? I would certainly appreciate it.

Best wishes-

Sincerely,

June B. Edwards (Mrs)
Instructor

June B. Edwards & Assoc's
3100 Durrwood Street
Bakersfield, Calif. 93304
March 25, 1975

Technology Use Studies Center
Southeastern State College
Durant, Ok. 74701

Gentlemen:

Can you supply a complimentary copy of the publication listed on the attached form?

Thank you.

Sincerely yours,

M. Roy
Librarian

PUBLICATION REQUEST

Author General Aviation Technical Newsletter

Title Please place this library on your mailing list for future issues.

We would also appreciate any back issues still available for distribution.

Source Technology Use Studies Center
Southeastern State College
Durant, Ok. 74701

Price

Copies

TRANSPORTATION CENTER LIBRARY
Evanston, Illinois 60201
October 30, 1975

Technology Use Studies Center
Southeastern State College
Durant, Oklahoma 74701

Dear Sirs:

We are in the process of establishing an aviation safety and education reference library and would appreciate any pertinent, complimentary materials you may be able to extend to us.

Our address is: Connecticut Department of Transportation
Bureau of Aeronautics
Aviation Safety & Education
P.O. Drawer A
Wethersfield, Connecticut 06109

Thank you in advance.

Very truly yours,

Herbert A. Preissner
Director of Aviation Safety & Education
Bureau of Aeronautics
November 5, 1975

Mr. Herbert A. Preissner, Director
Aviation Safety and Education
Bureau of Aeronautics
State of Connecticut
24 Wolcott Hill Road
Wethersfield, Connecticut 06109

Dear Mr. Preissner:

The University Safety Education Department is interested in expanding the Safety Program to include aviation safety. As yet, the program has not been developed, thus relevant materials requested in your letter of October 30 are not available.

There are numerous NASA reports indexed under the Aviation Safety classification; however, we do not believe they would be appropriate for your purpose since these reports usually refer to specific incidents or equipment research.

The Directorate of Aerospace Safety of the USAF Inspection and Safety Center, Norton AFB, California; the Army Safety Center at Fort Rucker, Alabama; and the FAA Academy, Oklahoma City, Oklahoma, are good references for Safety Education materials. Both USC and Arizona State have outstanding safety programs. They provide safety education programs to most military services on a contract basis. Either one or both of these schools can provide you with a current bibliography of safety references and possibly materials as well.

Thank you for contacting TUSC; we hope this information will be of value.

Sincerely,

Bill Dodd
Industrial Specialist
July 18, 1974

Mr. Gold:

Thank you for sending the TUSC News to our office, we have enjoyed these publications very much.

You note that we are on your mailing list, however, we have not received the June Issue, if June was the last issue.

The latest one we have is April 1974, if there have been any others since that date, we would appreciate receiving those.

Thank you and keep up the good work!

Frank T. Edwards
Director
Mr. Frank T. Edwards  
Director  
Oklahoma Aeronautics Commission  
424 United Founders Tower Building  
Oklahoma City, OK 73112  

Dear Mr. Edwards:

Thank you for your note of July 18, 1974.

Yes, we did have a June issue of the General Aviation News Letter, and we regret your not having received your copy. We mailed some 750 copies of the News Letter. Either yours was lost in the mail; or due to our oversight, we failed to send your copy. In any event, here's your belated copy.

Thanks again for your kind comments about the publication.

Sincerely,

C. Henry Gold  
Director

Enclosure
Mr. A. M. Moore
Technology Use Studies Center
Southeastern Oklahoma State University
Durant, OK 74701

Dear Mr. Moore:

It was a pleasure meeting and talking with you at the Technology Utilization Program Conference in Denver last week. In response to your request, our Public Information Office has added your name to the distribution list for the LEWIS NEWS. Meantime, a copy of the most recent issue is enclosed. In turn, could you send me the TUSC NEWS? I feel very strongly that better communications among the elements of the Technology Utilization Program is our most pressing problem. Whenever we can be of assistance, please let me know.

Sincerely,

Paul Foster
Technology Utilization Officer

Enclosure
A. M. Moore, Editor
The TUSC News
Southeastern State College
Durant, Oklahoma 74701

Dear Mr. Moore:

In reference to your letter of June 26, 1974 please add my name to your mailing list for the General Aviation Technical News Letter.

Sincerely,

Benito Casados, Manager
Public Educational Services

BC:dn
Mr. A. M. Moore, Editor,
TUSC News,
Southeastern State College,
Durant, Okla. 74701.

Dear Mr. Moore,

Cliff Cernick, Public Affairs Director, FAA NW
region in Seattle sent me a copy of your most recent
mailing, 26 June, '74.

From the scope of material you are working with, I
would certainly appreciate being added to your mailing
list.

I am the Western Editor for AOPA PILOT Magazine (Circ.
180,000+) and almost all my photography and writing is
in the field of general aviation.

I've been a member of the Aviation/Space Writers Assn.
for more than 25 years and am a member of the Society of
Experimental Test Pilots. I've been flying for more than
35 years, have nearly 8500 hours and keep my CFII rating
current. Much of my flying these days is done in a 1952
Cessna 170B that my wife and I own.

Many thanks, in advance, for adding me to your mailing
list. Please use the Glendora, Calif. mailing listed
above and not the home office address in Washington, D.C.

Sincerely,

[Signature]

Don Downie
Western Editor
August 19, 1974
3332 Fernway Drive
Montgomery, Alabama 36111

The TUSC News
Technology Use Studies Center
Southeastern State College
Durant, Oklahoma 74701

Dear Sirs,

I have recently had occasion to read the Volume II, Number 1, June, 1974 issue of your newsletter, and I found it intensely interesting and informative of current aerospace developments. Since I am professionally involved in communicating aerospace concepts graphically, I would like very much to be included in future distribution. Please inform me if any costs are involved in this matter.

I thank you for your time and attention.

Respectfully,

James O. Johnson.
September 16, 1974

Technical Use Studies Center
Southeastern State College
Durant, Oklahoma 74701

Dear Sirs:

Could you please send us the following report?


Thank you very much.

Sincerely,

Garwin Lorain
Principal

GL/di
October 17, 1974

Reference: Telecon, Moore to Lorain
October 17, 1974

Mr. Garwin Lorain
P.O. Box 8976
Reno, NV 89507

Dear Mr. Lorain:

Enclosed you will find report number TN D-7542. We trust that this will meet your requirement and that we may be of further service to you. The cost of this report is $2.00.

Sincerely yours,

A. M. Moore
Industrial Specialist

A.M.:bf
Mr. Mitch Mayborn  
3164 Whitehall  
Dallas, Texas 75229

Dear Mr. Mayborn:

Today via third class mail we sent you a copy of the NASA TT F-806 report as you requested on your postcard. On page 2 you will find information on ordering reports mentioned in the Letter.

We Xeroxed this report, because the $.05 per page for xeroxing is cheaper than the price quoted on page 2.

We trust that this procedure is satisfactory and that we may be of further service to you.

Sincerely,

A. M. Moore  
Editor

AMM/sgw  
Enclosure
26 November 1974

A. M. Moore, Editor
Aviation Technical News
Southeastern Oklahoma
State University
Durant, Oklahoma 74701

Dear Mr. Moore,

Enclosed is the reply card with my address for your mailing list. Enclosed also is a copy of the quarterly magazine "The Flying Physician" of the Flying Physician's Association. We are approximately 2500 physician fliers who are interested in aviation safety and aviation medicine. I will read your newsletter with interest and wonder about the possibility of reprinting some of your information from time to time in our magazine.

Would appreciate hearing from you regarding this.

Very truly yours,

George M. Gumbert, Jr., M. D.

GM/Gew

Enclosure
George M. Gumbert, Jr., M.D.
Editor, Flying Physicians Association, Inc.
2537 Larkin Road
Lexington, Kentucky 40503

Dear Sir:

Thank you for sending me the copy of "The Flying Physician." It is a very fine publication and I shall subscribe to it.

You are welcome to use any material appearing in the TUSC "General Aviation-Technical News." None of the material is copyrighted, and we would be pleased to have you use it.

If you or your staff would like a full copy of reports you find mentioned in the Newsletter, we will lend a hand in securing such copies.

Sincerely,

A. M. Moore
Editor

AMM/sgw
Mr. A. M. Moore, Editor
The TUSC News, General Aviation - Technical Edition
Technology Use Studies Center
Southeastern State College
Durant, Oklahoma 74701

Dear Mr. Moore,

Mr. Al Dubiel, Director of Public Relations at Los Angeles Ontario International Airport, recently gave me a copy of the September, 1974 issue of your general aviation NASA technology utilization newsletter. I found it most interesting for several reasons.

Perhaps most notable was my surprise about not knowing of your publication previously. As a commercial pilot and aircraft owner, I try to keep abreast of developments in general aviation. This includes subscribing to a variety of periodicals ranging from Aviation Week to General Aviation News, but I cannot recall having seen any mention of The TUSC News.

I thought I was pretty well aware of NASA TU publications, also. (The week before Al gave me this copy I was in Jeff Hamilton's office at NASA HQ discussing commonalities between NASA TU and the Navy's Technology Transfer program on which I was working.)

At any rate, I am definitely interested and would like to be placed on your distribution list if at all possible. What is the availability of copies of back issues?

Finally, I was particularly interested in the article by Frank Cross on fluidics. I wonder if he is familiar with a TU Survey on fluidics that I did a couple of years ago? It's NASA Contributions to Fluidic Systems (SP-5112). I'll enclose a synoptic of it in case he's interested.

I tend to split hairs and differ slightly from Frank Cross's definition of fluidics. The most accepted definition in my experience uses the term "fluid dynamic phenomena" rather than "fluids (liquid or gas)". As his article states, there are hybrid systems, and indeed the example he cites from NASA Tech Brief B70-10167 is actually a moving-part hybrid fluidic device.

I enjoyed your September issue and shall look forward to seeing others.

Yours sincerely,

Terry M. Weathers
Engineering Consultant

encl: AIAA fluidics synoptic

p.s. You may & obtain more information on the Technology Use Studies Center?
Mr. Terry M. Weathers
Engineering Consultant
Weathers Technical Systems
Box 51A, Route 1, Quartz Valley
Fort Jones, California 96032

Dear Sir:

We were pleased to receive your letter dated 7 October, 1974, and will comply with your request for your name to be put on the mailing list.

Our "Newsletter" is rather new and experimental in nature. It has been designed specifically for a technical level expected in an average state Aeronautics Commission. We have found that these political appointees have considerable responsibility in aviation and with very limited means for obtaining technical information. We do not have the ability to write for the engineer and, therefore, try to aim for this "laymen" level.

I will take up with Jeff Hamilton his failure to inform you of our publication, since it took considerable badgering on our part to get Jeff to fund it.

We concede your point on the Frank Cross article regarding fluidics. We deliberately moved away from engineering terminology for the reason mentioned above. Incidentally, fluidics has been used for years around drilling rigs and in oil fields. Not long ago I watched them proportion dry cement into a drilling mud...a very unique fluidic system that has been in use for many, many years.
Mr. Terry M. Weathers

The Technology Use Studies Center was originally established as a part of the Regional Dissemination Center concept. We opted to remain small and avoided charging for our services and explore many avenues for disseminating technology. This Newsletter is one of the typical experiments we have carried on for this purpose. The Newsletter goes to about 750 addressees and is being well received from our viewpoint.

Your name on our list, as well as the comments of your letter, are most welcome.

Sincerely,

A. M. Moore
Editor

AMM/sgw
December 2, 1974

A. M. Moore, Editor
Southeastern Oklahoma State University
Durant, OK 74701

Dear Mr. Moore:

In regard to your letter of November 20, 1974, please add our name to your mailing list for the "General Aviation Technical News" letter.

Thank you for your consideration.

Sincerely,

M. Gene Dow

Editor

MGD:sh
December 4, 1974

Dear Sir:

We have found your TUSC News to be excellently prepared -- brief, informative and valuable.

If it wouldn't be too much to ask, I would like to receive both an office copy for our editorial staff and a home copy for myself.

Our office address is on the letterhead and my home address is given below my signature. Keep up the good work and many thanks.

Sincerely,

Murray Smith
Publisher, PRO PILOT
701 So. Pitt Street
Alexandria, VA 22314

Editor, The TUSC News
General Aviation - Technical Edition
Technology Use Studies Center
Southeastern State College
Durant, OK 74701
Mr. A. M. Moore, Editor
General Aviation Technical News Letter
Technology Use Studies Center
Southeastern Oklahoma State University
Durant, OK 74701

Dear Mr. Moore:

With reference to your letter of December 10, 1974, we have added your name to the World of Agricultural Aviation mailing list as a complimentary subscription. We will be please to receive your General Aviation Technical News Letter.

Sincerely,

F. Farrell Higbee
Executive Director

fh/dg

OFFICERS
AL F JOHNSON PRESIDENT
P.O. BOX 13
MAGNOLIA DELAWARE 19962

JAMES L MAXWELL VICE PRESIDENT
RT. 1 BOX 30
BENOIT MISSISSIPPI 38725

ROBERT COPELAND SECRETARY
171 W SHANNON
CHANDLER ARIZONA 85224

ROBERT AUKES TREASURER
P.O. BOX 43
JACKSONVILLE ARKANSAS 72076
7 JANUARY, 1975

A. M. MOORE, EDITOR
THE TUSC NEWS
SE OKU
DURANT OK

DEAR MR. MOORE:

I was pleased to have your card passed along to me. The General Aviation Technical Division, TUSC News seems particularly valuable to me. I have been trying for several years now to help and encourage NASA to do more work in the long neglected low speed regimes. Even with this close relationship it's difficult to know what current activity is important to this field. Your publication helps to solve this problem for me. Your format is quick and efficient.

Please include me on your mailing list for general aviation, low speed, high efficiency aerodynamics topics. And, of course, airport planning.

My best wishes for your efforts.

A. J. SMITH

If possible, please mail previous issues of Aviation Technical News.
January 23, 1975

Commander Aircraft Division
Rockwell International
Executive Office
5001 North Rockwell Avenue
Bethany, Oklahoma 73008

Dear Sir:

Mr. A. M. Moore, editor of the General Aviation Technical News Letter and staff member of the University, visited your plant facility on January 17. I join Mr. Moore in thanking you for the courtesy extended to him by all personnel in the Bethany plant. Mr. Rick Alexander was especially helpful and thoughtful during Mr. Moore’s visit.

Our Aviation program here at the University is structured to train professional people for operational duties in general aviation as well as to offer the best training for A & E professionals. In view of our purpose, it is necessary for our staff personnel to keep abreast of the developments in the field. The visit to your facility will help us serve general aviation’s training needs.

Thanks for your cooperation.

Sincerely,

Leon Hibbs
President

LH/sw
January 23, 1975

Messrs. Bob Chambers and Hugh Wilson
Dusters & Sprayers Supply, Inc.
Box 766
Chickasha, Oklahoma 73018

Dear Messrs. Chambers and Wilson:

Mr. A. M. Moore, editor of the General Aviation Technical News Letter and staff member of the University, visited your facility on January 16. He has apprised me of the fine operation you have created and of your rather unique and world-wide service to agricultural aviation.

I join Mr. Moore in thanking you for the courtesy extended to him during his visit. It is incumbent that our staff personnel keep abreast of developments in general aviation because of our programs which embrace both operations and maintenance of general type aircraft. I thank you for helping in our effort to keep our University Aviation program viable.

It is pleasing to learn that we have in Oklahoma an organization of your stature and with the capabilities for serving Agricultural Aviation on a world-wide basis. I congratulate Dusters & Sprayers Supply, Inc., upon the service you are rendering; and I thank you for helping the University in its efforts to serve.

Sincerely,

Leon Hibbs
President

LH/sw

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March 17, 1975
Box 73
Howard Lake, MN  55349

T.U.S.C.
Southeastern Oklahoma State University
Durant, Oklahoma  74701

Dear Sirs:

I am a senior at St. Cloud State College and I desperately need (by 4/15/75) information comparing the costs associated with a dirigible with the costs of other types of air transportation.

Precisely, the information I am looking for is bibliographies and/or technical reports covering the feasibility of the dirigible for:

1. Air freight.

2. Passenger travel, e.g. a world cruise

Any information that you can supply me with in these areas will be sincerely appreciated.

Yours truly,

Jerry D. Thorson

Jerry D. Thorson
March 20, 1975

Mr. Jerry D. Thorson
Box 73
Howard Lake, MN  55349

Dear Mr. Thorson:

There has been considerable interest demonstrated in lighter-than-air vehicles in the past months. We have had several inquiries and have searched the literature for information similar to what you request. However, our searches have not been fruitful; all of the information is dated in the 1920's and involves materials that have been replaced by better materials and cost figures that are not at all realistic.

A fall issue of Fortune magazine has a very fine article on lighter-than-aircraft, but it may not give you answers that are satisfactory. It is informative, and I believe it is in the December 1974 issue.

I am sorry that we cannot respond satisfactorily to your inquiry.

Sincerely,

A. M. Moore
Industrial Specialist

AMM/sgw
Mr. Auggie M. Moore, Director
Technology Use Studies Center
Southeastern Oklahoma State Univ.
Durant, OK 74701

Dear Auggie:

Consistent with our recent telephone conversation, I have enclosed copies of papers that were presented by Langley personnel, which you may find of interest. I will continue to send you copies of papers that cover the aeronautical field.

I hope to see you at the Technology Utilization Program Conference at Langley May 20-22, 1975.

Sincerely,

John Samos
Technology Utilization and Applications Programs Officer

6 Enclosures
Mr. John Samos  
Technology Utilization and Applications Programs Officer (139A)  
National Aeronautics and Space Administration  
Langley Research Center  
Hampton, Virginia 23665

Dear John:

The enclosures with your letter dated 22 April, 1975, are appreciated very much. Material such as this keeps our wheels rolling and, we hope, some exposure for personnel at Langley. Our Newsletter goes to 33,000-plus readers now, and we are in need of help such as you offer.

Thanks again, John, and I look forward to seeing you in May.

Sincerely,

A. M. Moore, Editor  
General Aviation Technical Newsletter

AMM/sgw
April 24, 1975

Mr. Clinton T. Johnson
Technology Utilization Officer
National Aeronautics and Space Administration
Flight Research Center
Box 2731
Edwards, California 93523

Dear Clint:

I am deeply grateful for the help you are providing to us from FRC. I have not been getting from the other centers the type of material you provide. However, I do get considerable material from the general aviation office in D. C.

Your material has been especially helpful; and, again, we thank you.

Sincerely,

A. M. Moore, Editor
Aviation Technical News Letter

AMM/sgw
Mr. A. M. Moore
Editor
AVIATION TECHNICAL NEWS
Technology Use Studies Center
Southeastern Oklahoma State
Durant, Oklahoma  74701

Dear Mr. Moore:

Your newsletter, AVIATION TECHNICAL NEWS, is excellent. The articles included are timely, well-written, and of interest to us at the General Aviation Manufacturers Association. It is always good to see newsletters which better inform us on developments in general aviation.

Would you please continue sending us this newsletter. Thank you.

Sincerely,

Stanley J Green
Vice President - General Counsel

July 17, 1975
HiMAT

Rockwell International Corporation has been awarded a contract to build two "highly maneuverable aircraft." The aircraft will be unmanned, "Remotely Piloted Research Vehicles," 21 feet long, with a wing space of 15 feet. Large canards are on the end of each wing and twin vertical tails are on booms off the wing trailing edge. They will have a GE J85 jet engine capable of achieving supersonic speed and a maneuvering capability of 8 Gs.

AIRCRAFT FUEL-SAVING, SENATE BRIEFING
(Langley Researcher, October 3)

Dr. George M. Low and associates briefed the Senate Committee on Aeronautical and Space Science on a proposed government-sponsored research program aimed at a 40-50% reduction in fuel consumption by civil transport aircraft. Six programs of research were presented:

<table>
<thead>
<tr>
<th>Engine component improvement</th>
<th>by 1980</th>
<th>5% improvement in fuel savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel conservative engine</td>
<td>1990</td>
<td>10%</td>
</tr>
<tr>
<td>Fuel conservative transport</td>
<td>??</td>
<td>15-20%</td>
</tr>
<tr>
<td>Turboprops</td>
<td>??</td>
<td>15-20%</td>
</tr>
<tr>
<td>Laminar flow control</td>
<td>1985</td>
<td>20-40%</td>
</tr>
<tr>
<td>Composite primary structures</td>
<td>??</td>
<td>10-15%</td>
</tr>
</tbody>
</table>

A VISIT TO THE CARRIER LEXINGTON

The writer recently had the privilege of spending two days observing flight operations on both land (at Kingsville NAS) and the flight deck of the Carrier Lexington. The well-known skill and professionalism of Navy pilots needs no defense or exhortation in this publication. However, other observations made during the visit might be of interest.

When France wound down the Algerian War in the late fifties and early sixties, many T-28's used as fighters in that war found their way into the aircraft boneyard of France. The USAF had largely deleted them from the inventory by the early fifties and production ended. I observed some of these aircraft on the Navy flight line which looked like they might have left the Columbus, Ohio, factory the week before. The added burden of protecting these aircraft from corrosion in a salt atmosphere probably contributed to their new-from-the-factory look. However, a peek under the inspection panels and into the innards of the birds convinces one that this Navy maintenance is more than skin-deep. The USN maintenance is truly outstanding.
Many football teams could profit from observing the teamwork and coordination exhibited by the flight deck crew of the Lexington. A canted deck allows landings and takeoffs simultaneously. Aircraft are hand-moved from the landing side to the launch side, and I believe it takes the crew less time to retrieve and then launch a fighter than it would take to land a Cessna 150, stop the aircraft, taxi back to the takeoff end of the runway, and take off. During the move from the tail hook cable to the launch, the fighter is inspected, the trim is verified by the ground crew, and other launch preparations are completed. This and other work is performed amid the moving cables of the arresting system and the launch system, the scream of jet engines at full power being held on the arresting cable, and at launch position.

The smell of jet exhaust and tiring effect of a 27K wind across the deck are with the crew constantly. It takes some fine physical attributes, dedication, and a lot of training to do the job the flight deck crew performs. I have a great respect for these people.

Skeptics have viewed the difference between a land-based aircraft and one designed for arrester hooks on a carrier as being chiefly that of having the tail hook mechanism welded on to the longerons of the land-based job. Operations on a canted deck and with jet engines involves a bit more than adding a tail hook as an afterthought. A carrier jet hits the end of the arresting cable at full engine power so that it can become airborne again if the hook fails to catch. Stopping a jet fighter from flying speed to zero speed with the engine at full bore takes a lot of stopping in that distance. There has to be many pounds of pig iron in the aft end of an airplane to take the punishment of arrested landings.

INTEGRATED PROGRAMS FOR AEROSPACE VEHICLE DESIGN (IPAD)

Ref: NASA SP-372, pages 213-271
By George W. Brooks

Milestones in aviation have been mentioned quite frequently in this publication. Some have been recognized as they occurred by those connected with the industry. A development came to our attention during an August visit to Langley Research Center which has been difficult to categorize; with time to think about the development, it now appears that it may be worthy of the designation of "milestone" in aviation.

IPAD provides a means for exploiting the capability of modern computers and computer techniques in the design and development of aircraft. Programs for analyzing structures, aeroelasticity aerodynamics, and general structural arrangement are in being and will be available to the designer on a custom basis. Langley Research Center advertised in the Commerce Daily on August 19 for proposals from organizations having the capability to respond to requests from designers for this service. They had more than a dozen respondents to the RFP and, hopefully, the project will be operational in the spring of '76. Wide publicity will be provided when the concept comes on line. Figures 1 and 2 (next page) depict pictorially how the system will work.
Figure 1.- NASA integrated programs for aerospace-vehicle design (IPAD).

Figure 2.- Contour plots showing wing cover thickness distributions for flutter, strength, and combined designs (ref. 35).
COMPOSITE -- FIBERS

We have tried to keep up with the development and employment of "fibers" or "whiskers" in metalurgical applications. They are being tested and gradually finding a place in aeronautical structures. Wide usage has been hampered by the lack of fabrication know-how and the price of the fibers themselves. When the fibers retailed for around $3,000.00 per pound in the mid-sixties, there were not many applications that would pay off in the commercial field. It is a case of the price being high because of the limited demand and the demand being limited by the price. Now, composite and fiber fabrication and utilization are getting over into the non-aerospace field. Skyline Industries, Inc., of Fort Worth, Texas, is coming out with a line of sports equipment that will employ graphite fibers manufactured by Union Carbide. The company has experience in the field of composites as a result of their work with General Dynamics, Bell Helicopter, and others. They will be making tennis rackets, golf clubs, and fishing rods with appropriate application of composites.

(American Metal Market/Metal Working News)

ERROR IN AUTHORSHIP

In the July issue (Volume II, No. 6) of this publication, the wrong person was credited with authorship of an article. "United States Fuel Economics" was written by Arthur Alexander III.

OBIQUE WING

We have "fixed wing" and "retary wing" pilots. It appears that we may add a third classification. LTV is making a feasibility study of putting an "oblique" wing on an F-8 Navy fighter. The wing pivots at the mid-point so that one wing tip gets ahead of the other for high speed flight. The artist's conception of the F-8 looks like the leading edge of the wing might move from the 90-degree position in relation to the fuselage to about a 60-degree angle on the side with the leading wing tip. The NASA Flight Research Center is monitoring LTV's study and if it results in hardware, the "oblique" will probably be flown there.

STATUS AND TRENDS IN ACTIVE CONTROL TECHNOLOGY

Ref: NASA SP-372, Article by Herman A. Rediess and Kenneth J. Szalai

The emergence of highly reliable fly-by-wire flight control systems makes it possible to consider a strong reliance on automatic control systems in the design optimization of future aircraft. This design philosophy has been referred to as the control configured vehicle approach or the application of active control technology.

Active control technology refers to a class of functions that can be performed by control systems to enhance an aircraft's design. If flight control specialists as well as aerodynamics, structures, and propulsion specialists are involved in the preliminary design process, the synergist effect of an integrated design can be exploited to an extent not previously possible. This design
philosophy has been referred to as the control configured vehicle approach or the application of active control technology. Several studies and flight tests sponsored by the Air Force and NASA have demonstrated the potential payoffs of control configured vehicles and the application of active control technology.

Active controls, supercritical wing, fly-by-wire

Supercritical wing

Basic JetStar

27 percent

8 percent

Relative reduction in fuel consumption

Figure 3.- Potential benefits of applying active control technology.

COANDA EFFECT

Apparently there will be an increase use of jet exhaust and air bled from compressors to increase lift in the next generation of aircraft. Boeing is running ads on their YC-14 transport and mentioning that they are taking advantage of COANDA EFFECT for the remarkable performance they expect. Here is how "the-book" describes the COANDA EFFECT: The tendency of a jet gas to follow the wall contour when discharged adjacent to a surface, even when the surface curves away from the jet discharge axis, is known as the COANDA EFFECT.

OPERATIONAL FLIGHT EVALUATION OF THE TWO-SEGMENT APPROACH FOR USE IN AIRLINE SERVICE (NASA CR-2515)

The aviation press has given generous coverage of the difference in view of pilots in regard to two-segment approaches for landing aircraft. The time-honored approach has been at a 3-degree angle. This flat slope exposes a lot of geography to a high decibel-count noise. Someone came up with the idea of breaking the glide slope into two segments, a 6-degree slope at the beginning of the let-down procedure, and flattening the glide to 3 degrees before touch down.
United Airlines wrote a report for Ames Research Center summarizing the results of transport pilot's evaluation of the TWO-SEGMENT approach in the B-727 aircraft.

The approach profile evaluated consists of a 6-degree segment initiated at 3000 feet or more above ground at typical approach speed and flattening the slope to 3 degrees and a stabilized condition at 500 feet above the field.

Besides an intense simulator evaluation, 196 two-segment approaches were made in a B-727 during Engineering Flight Evaluation. An additional 102 two-segment approaches were made in a United Airlines B-727 before the system was tested in service. Fifty-seven pilots from thirteen airlines and pilot associations, aircraft manufacturers, and government agencies participated in flights before the system was put into service. UA put the system into service, in one airplane, on the West Coast in April 1973 and tested it over a six-month period. During more than 700 approaches, 555 were documented two-segment approaches.

This statement appears in the summary of the report: "The consensus of these pilots is that the system provides a safe, easy-to-fly two-segment approach. With proper coordination, the procedure can be integrated into the existing air traffic control environment with negligible impact."

NOTE. Two unacceptable constraints were found with the 727 in this procedure. (1) During the higher altitude 6-degree segment, a tail wind of 20K. or more slows the airspeed in order to stay on the slope so that the sink rate is too high. (2) Power is retarded on the 6-degree slope to a setting that doesn't provide enough hot air bleed for anti-icing.

In regard to noise abatement, these statements appear in the report: "...both the out-of-service and in-service evaluations verified that the profile provides significant noise abatement. Results indicate that, beyond 2.8 n.m. from touchdown, a 6-8 EPNdB reduction is achieved under the path of the two-segment approach as compared to the standard ILS.

SST

The Concorde is generating a lot of noise pollution; about 50% of it comes from groups on the ground. The Wall Street Journal for Thursday, October 16, carried an article which repeats statements generally accepted as true which in fact have not been proven nor accepted by knowledgeable people. The article mentions that a study has shown that a "large fleet of high-flying SST's could seriously damage the ozone shield in the stratosphere, which protects humans on earth from overdoses of ultraviolet light from the sun, a sizeable rise in skin cancer could result." The article mentioned, it is believed, is the one that has 500 SST's flying in the 80's with engines having exhaust characteristics of the mid-fifty engines. There is still much argument among scientists in regard to the location of the ozone belt with relation to the poles, how thick the layer is, origin of ozone, and how it is replenished. The article continues: "The Environmental Defense Fund has unearthed documents showing that in 1972 the British and French asked the FAA for an exemption allowing the Concorde to arrive at U.S. airports with "less than normal fuel reserves" and for "preferential" landing rights so it could "avoid normal holding patterns." The FAA says that it will give the Concorde no special treatment and that it doesn't "now need such help." The Environmental Defense Fund had to get over into the
cockpit to bring that one up. Thankfully, the EDF "buzz words"—cancer and ozone—didn't stampede the FAA.

The Brits pioneered jet transports with the Comet; it is hoped that their venture with the French in the Concorde will not be shot down by half-baked slogans and juvenile jealousies. It would be nice for young Americans to get a look at a modern transport even if it's not American made.

ATLIT

The Advanced Technology Light Twin-Engine Airplane flying at Langley Research Center has made a total of 32 flights as of November 10th. The aircraft is a production Piper Seneca with GA(W)-1 airfoil wing replacing the production wing. There appears to be some aerodynamic drag associated with saddling the fuselage on to the wing that was not designed to fit the curvature of the wing. Tufts indicate turbulence along the fuselage aft of the wing TE and around the front half of the baggage door. They expect to go into the full-sized wind tunnel and accumulate more precise data on the airplane. Spoilers are used for roll control and the bread-board installation has a bit of friction which is disturbing in initial small increments of roll control. The spoilers are giving satisfactory "aileron control."

OPPORTUNITIES FOR AERODYNAMIC-DRAG REDUCTION

The use of end plates to reduce induced drag was involved in a patent obtained by Lanchester in 1897, although the first experiments utilizing end plates did not take place until about 1924. Since that time, end plates have been suggested on a relatively continuous basis as a means for reducing induced drag. Applications to date, however, have shown that for cruise lift coefficients, the added skin-friction drag of the end plates more than offsets any reduction in induced drag.

Just recently the concept of a specially tailored end plate has been proposed by Whitcomb. These winglike devices, or "winglets," at the tip of the main wing are designed with the same intention to flow field detail as in the design of a main wing. For example, supercritical sections with appreciable camber are used. To minimize skin friction, the chords of the winglets are less than the wing chord, and the area is about 2 percent of the area of the main wing. The top winglet is attached near the trailing edge, and the lower winglet is placed forward in order to minimize interference. The winglets are canted out from the main wing about 17.5°. The aspect ratio and sweep of the upper winglet are approximately the same as for the main wing. The lower winglet is "clipped off" for ground clearance. A recent addition has been a small vortex generator just inboard of the upper winglet to break up a small separation bubble. At this writing, the winglets are still under extensive wind-tunnel development. Preliminary results indicate induced-drag reductions of more than 15 percent.

(Excerpt of article by Robert E. Bower, Langley Research Center, NASA SP-372)