
Copyright © 1981 by Digital Equipment Corporation

The information provided herein is for the independent evaluation and interest of users of educational applications. DIGITAL has not undertaken an investigation of the products described herein, including the product's operation or functions.

The products herein and their descriptions have been submitted to DIGITAL by the indicated organization. DIGITAL disclaims all obligations with respect to the accuracy of the statements and the performance or the maintenance of the products contained herein. DIGITAL is not responsible for any errors which may appear in this catalog.

Printed in U.S.A.

The following are trademarks of Digital Equipment Corporation, Maynard, Massachusetts:

UNIBUS
PDP
OMNIBUS
DIGITAL
DEC
VAX
INTRODUCTION
An educational computer installation must be able to draw on a vast library of application software in order to maximize its effectiveness as an instructional or administrative resource. Recognizing this need, DIGITAL has for years encouraged the development of application software, whether by its users, its own staff, or third parties. In order to increase customer awareness of this resource and provide an easy method for its use, DIGITAL presents the Fourth Edition of our popular Index and Description of Educational Application Software (IDEAS).

This edition includes all programs listed in previous IDEAS books plus 100 new listings. The programs run under the VAX/VMS and RSTS/E DIGITAL operating systems.

As with previous editions, this edition is not exhaustive, but is rather a compendium of application software judged by DIGITAL to meet the following criteria:
1. Relevant to a significant segment of educational computer users.
3. Readily available.

Note that price and source were not used as selection criteria. Most programs indexed herein are available from the DECUS user-group library and are available directly from users or third parties. Prices also vary: the majority are available for a small service charge, but some cost several thousand dollars.

DIGITAL encourages you to share your software solutions with others via the IDEAS book. A handy Package Submission Form can be found in the Appendix to simplify the process. All IDEAS can be sent to the following address:

IDEAS Editor
Education Computer Systems
MR1-1/M40
Digital Equipment Corporation
200 Forest Street
Marlboro, MA 01752
USA

* "Running" here means per the program author's claim only, and implies no warranty of the software unless specifically stated by the program author.
IMPORTANT: PLEASE READ THOROUGHLY

HOW TO USE THIS BOOK
Several changes have taken place in the organization of IDEAS since the last edition. The contents have been refined to include more specific application disciplines. Software running on DIGITAL's VAX-11/780 has been added, and Appendices containing a variety of forms (IDEAS mail list, etc.) and relevant information are now included (see "Appendices" below for details).

The IDEAS book is an index only. To actually order programs, readers can write directly to the address of the developer or the appropriate address listed below under "Availability."

ORGANIZATION
The index is divided into three main sections with specific applications listed alphabetically within each section as follows:

I. ADMINISTRATIVE APPLICATIONS:
   - Data Management
   - Financial Facilities
   - Guidance Information Systems
   - Library
   - Student Records

II. INSTRUCTIONAL APPLICATIONS:
   - Business
   - CAI/CMI/CAT
   - Computer Science/Languages
   - Engineering
   - Mathematics
   - Physical Science
   - Social Science
   - Statistics

III. UTILITIES:
   - Graphics
   - Networks/Communications
   - System Utilities

Page Format
Each program or package is represented by a page (or more) which describes it in a standard, consistent manner. A few comments regarding some of the information categories follow:
Entry Index by Operating System

This section, which appears in the front of IDEAS, will state only the major DIGITAL operating system required; it is not an attempt to specify precisely the minimum required hardware. Readers interested in a particular package should consult its available supporting documentation for special system requirements such as file space, main memory, etc.

Availability

Programs are available from several sources:

a. **DECUS Library** — DECUS is the Digital Equipment Computer Users Society. Programs from their Library are **Available to DECUS Members Only**. All members receive periodic information on DECUS programs including catalogs, prices, and ordering procedures. See the forms section for a form describing types of membership and instructions for obtaining membership information, or write directly to the DECUS office in your area, listed below:

   DECUS Australia  
P.O. Box 491  
Crows Nest, New South Wales 2065  
Australia

   DECUS Canada  
P.O. Box 11500  
Ottawa, Ontario K2H 8K8  
Canada

   DECUS Europe  
C.P. 510  
12, avenue des Morgines  
CH-1213 Petit-Lancy 1,  
Geneva, Switzerland

   DECUS U.S. and  
Office of the Executive Director  
One Iron Way  
Marlboro, Massachusetts 01752  
USA

b. **Directly from DIGITAL** — Contact your local DIGITAL sales office or the Education Computer Systems group directly.

c. **Outside Sources** — In this case an explicit mailing address will be given.
Pricing information, if known, is given in this section subject to the following disclaimer:

Prices shown herein are representative of those in effect at press time. They are provided for general information only, are subject to change, and do not imply a commitment by DIGITAL or the software vendor.

No pricing information is given for DECUS programs, which are all available for a nominal service charge. Generally, this covers only the actual costs of media, reproduction, and handling.

For More Information
This paragraph will furnish either an explicit address or the “shorthand” address expanded below:

Education Computer Systems
MR1-1/M40
Digital Equipment Corporation
200 Forest Street
Marlboro, MA 01752
USA

This paragraph is generally omitted for DECUS programs because more information can always be obtained by ordering only the program’s documentation from DECUS.

Appendices
The following appendices are included:
A. Program Development and Transfer
B. Additional Software References

Forms, including:
— IDEAS Mailing List Forms
— DECUS Membership Information Form
— Reader’s Comment Form
— IDEAS Package Submission Forms (2)
<table>
<thead>
<tr>
<th>ENTRY INDEX BY OPERATING SYSTEM</th>
<th>Application Area</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSTS/E and RSTS-11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABC's of CAI, 5th Edition</td>
<td>CAI/CMI/CAT</td>
<td>96</td>
</tr>
<tr>
<td>ACCRPT, ALPCAT, FIRST</td>
<td>System Utilities</td>
<td>315</td>
</tr>
<tr>
<td>ADAABAS-M</td>
<td>Data Management</td>
<td>1</td>
</tr>
<tr>
<td>AES Daily Attendance Accounting Package</td>
<td>Student Records</td>
<td>48</td>
</tr>
<tr>
<td>AES Grade Reporting Package</td>
<td>Student Records</td>
<td>50</td>
</tr>
<tr>
<td>AES Scheduling Package</td>
<td>Student Records</td>
<td>52</td>
</tr>
<tr>
<td>AES Test Scoring Package</td>
<td>Student Records</td>
<td>54</td>
</tr>
<tr>
<td>AMBASE</td>
<td>Data Management</td>
<td>2</td>
</tr>
<tr>
<td>ANALOG COMPUTER SIMULATOR</td>
<td>Computer Science/Languages</td>
<td>130</td>
</tr>
<tr>
<td>BAS (Budgetary Accounting System)</td>
<td>Financial/Facilities</td>
<td>29</td>
</tr>
<tr>
<td>BASIC Application Programs: Business/ Social Studies</td>
<td>Social Science</td>
<td>233</td>
</tr>
<tr>
<td>BASIC TUTOR Programs</td>
<td>CAI/CMI/CAT</td>
<td>98</td>
</tr>
<tr>
<td>BASIC-Dartmouth Text Editor</td>
<td>System Utilities</td>
<td>316</td>
</tr>
<tr>
<td>Bentley College Accounting Package</td>
<td>Business</td>
<td>79</td>
</tr>
<tr>
<td>Bentley College Variety Package</td>
<td>Business</td>
<td>80</td>
</tr>
<tr>
<td>System</td>
<td>Category</td>
<td>Volume</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>BMDP</td>
<td>Statistics</td>
<td>251</td>
</tr>
<tr>
<td>Bronx Community Registration System</td>
<td>Financial/Facilities</td>
<td>30</td>
</tr>
<tr>
<td>BSO/ICECNV</td>
<td>System Utilities</td>
<td>317</td>
</tr>
<tr>
<td>BSO/OBJCNV</td>
<td>System Utilities</td>
<td>318</td>
</tr>
<tr>
<td>BURCOM-11</td>
<td>Networks/Communications</td>
<td>303</td>
</tr>
<tr>
<td>CADA Monitor</td>
<td>Statistics</td>
<td>254</td>
</tr>
<tr>
<td>CAI Package</td>
<td>CAI/CMI/CAT</td>
<td>100</td>
</tr>
<tr>
<td>CA/MICRO</td>
<td>System Utilities</td>
<td>321</td>
</tr>
<tr>
<td>Career Information System</td>
<td>Guidance</td>
<td>41</td>
</tr>
<tr>
<td>Casanova Package</td>
<td>Statistics</td>
<td>256</td>
</tr>
<tr>
<td>CASTLE: Computer Accounting Lab Environment</td>
<td>Business</td>
<td>81</td>
</tr>
<tr>
<td>CATCAR: Catalog Card Printer</td>
<td>Library</td>
<td>45</td>
</tr>
<tr>
<td>CL/MICRO</td>
<td>System Utilities</td>
<td>323</td>
</tr>
<tr>
<td>CMI: Computer Managed Instruction</td>
<td>CAI/CMI/CAT</td>
<td>101</td>
</tr>
<tr>
<td>COGNITIVE PSYCHOLOGY LABORATORY</td>
<td>Social Science</td>
<td>234</td>
</tr>
<tr>
<td>Compendium of DECAL CAI Programs</td>
<td>CAI/CMI/CAT</td>
<td>103</td>
</tr>
<tr>
<td>COMPUTE: Computer Generated Arithmetic Materials</td>
<td>CAI/CMI/CAT</td>
<td>104</td>
</tr>
<tr>
<td>Computer-Assisted Instruction in Economics</td>
<td>Business</td>
<td>83</td>
</tr>
<tr>
<td>Course</td>
<td>Category</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Computer-Assisted Instruction in English</td>
<td>CAI/CMI/CAT</td>
<td>106</td>
</tr>
<tr>
<td>Computer-Assisted Instruction in History</td>
<td>CAI/CMI/CAT</td>
<td>108</td>
</tr>
<tr>
<td>Conversational BASIC Programs</td>
<td>CAI/CMI/CAT</td>
<td>110</td>
</tr>
<tr>
<td>COSAP: Conversationally-Oriented Statistical Analysis Package</td>
<td>Statistics</td>
<td>257</td>
</tr>
<tr>
<td>CY/MICRO</td>
<td>System Utilities</td>
<td>324</td>
</tr>
<tr>
<td>Dartmouth Statistics Programs</td>
<td>Statistics</td>
<td>259</td>
</tr>
<tr>
<td>DATA BOSS/2</td>
<td>Data Management</td>
<td>6</td>
</tr>
<tr>
<td>DATACHECK</td>
<td>Statistics</td>
<td>262</td>
</tr>
<tr>
<td>DATA ENTRY SUBSYSTEM</td>
<td>Data Management</td>
<td>8</td>
</tr>
<tr>
<td>DECAL: Digital Equipment CAI Author Language</td>
<td>CAI/CMI/CAT</td>
<td>111</td>
</tr>
<tr>
<td>DECIMAL Arithmetic Package</td>
<td>Mathematics</td>
<td>188</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems</td>
<td>Business</td>
<td>84</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems</td>
<td>Computer Science/Languages</td>
<td>133</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems</td>
<td>Mathematics</td>
<td>189</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems</td>
<td>Physical Science</td>
<td>208</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems</td>
<td>Statistics</td>
<td>263</td>
</tr>
<tr>
<td>Program</td>
<td>Subject</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------</td>
<td>------</td>
</tr>
<tr>
<td>DELTA Teacher Assistance Programs</td>
<td>Student Records</td>
<td>55</td>
</tr>
<tr>
<td>DEPRESS</td>
<td>Social Science</td>
<td>238</td>
</tr>
<tr>
<td>DREAMS: An Electronic Mail System</td>
<td>System Utilities</td>
<td>326</td>
</tr>
<tr>
<td>DX (Document Exchange Utility)</td>
<td>System Utilities</td>
<td>328</td>
</tr>
<tr>
<td>EASY ENTRY DATA SYSTEM</td>
<td>Data Management</td>
<td>9</td>
</tr>
<tr>
<td>ECPRESS</td>
<td>Social Science</td>
<td>240</td>
</tr>
<tr>
<td>Educational Administration System (Version 2)</td>
<td>Student Records</td>
<td>56</td>
</tr>
<tr>
<td>Elementary Level Instructional Package, Vol. I</td>
<td>CAI/CMI/CAT</td>
<td>114</td>
</tr>
<tr>
<td>Elementary Level Instructional Package, Vol. II</td>
<td>Mathematics</td>
<td>191</td>
</tr>
<tr>
<td>Elementary Level Instructional Package, Vol. III</td>
<td>Mathematics</td>
<td>193</td>
</tr>
<tr>
<td>Energy Accounting System</td>
<td>Financial/ Facilities</td>
<td>33</td>
</tr>
<tr>
<td>Engineering Science (CAL) Program Exchange</td>
<td>Engineering</td>
<td>164</td>
</tr>
<tr>
<td>EUX 1: ENGLISH Usage Exercises 1</td>
<td>CAI/CMI/CAT</td>
<td>116</td>
</tr>
<tr>
<td>EZMARK System for Educational Processing</td>
<td>Computer Science/ Languages</td>
<td>134</td>
</tr>
<tr>
<td>Course/Program</td>
<td>Subject</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>--------------------</td>
<td>------</td>
</tr>
<tr>
<td>F-CHART-Solar Energy Analysis</td>
<td>Physical Science</td>
<td>211</td>
</tr>
<tr>
<td>Fraction Package</td>
<td>Mathematics</td>
<td>195</td>
</tr>
<tr>
<td>GENES: Genetic Calculations</td>
<td>Physical Science</td>
<td>212</td>
</tr>
<tr>
<td>GENIE (Computer Generated Instructional Materials)</td>
<td>CAI/CMI/CAT</td>
<td>118</td>
</tr>
<tr>
<td>GERMAN (Adjective Ending Game)</td>
<td>CAI/CMI/CAT</td>
<td>120</td>
</tr>
<tr>
<td>GIS: Guidance Information System</td>
<td>Guidance</td>
<td>42</td>
</tr>
<tr>
<td>GRAPAK: Graph Package</td>
<td>Graphics</td>
<td>289</td>
</tr>
<tr>
<td>GRADES II</td>
<td>Student Records</td>
<td>58</td>
</tr>
<tr>
<td>Huntington I Application Programs</td>
<td>Mathematics</td>
<td>197</td>
</tr>
<tr>
<td>Huntington I Simulation Programs-Biology</td>
<td>Physical Science</td>
<td>215</td>
</tr>
<tr>
<td>Huntington I Simulation Programs-Chemistry</td>
<td>Physical Science</td>
<td>217</td>
</tr>
<tr>
<td>Huntington I Simulation Programs-Earth Science</td>
<td>Physical Science</td>
<td>219</td>
</tr>
<tr>
<td>Huntington I Simulation Programs-Physics</td>
<td>Physical Science</td>
<td>220</td>
</tr>
<tr>
<td>Huntington I Simulation Programs-Social Studies</td>
<td>Social Science</td>
<td>241</td>
</tr>
<tr>
<td>Program</td>
<td>Category</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------</td>
<td>------</td>
</tr>
<tr>
<td>Huntington I Teacher</td>
<td>Student Records</td>
<td>59</td>
</tr>
<tr>
<td>Assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICSP: Individualized</td>
<td>CAI/CMI/CAT</td>
<td>121</td>
</tr>
<tr>
<td>Computational Skills Programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDA: Interactive Data Analysis</td>
<td>Business</td>
<td>92</td>
</tr>
<tr>
<td>Package</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INRAN, OUTRAN (Computerized</td>
<td>CAI/CMI/CAT</td>
<td>122</td>
</tr>
<tr>
<td>Question Generation #2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTAC</td>
<td>Data Management</td>
<td>11</td>
</tr>
<tr>
<td>INVSIM: Inventory Simulation</td>
<td>Business</td>
<td>93</td>
</tr>
<tr>
<td>LAURENCE</td>
<td>Graphics</td>
<td>290</td>
</tr>
<tr>
<td>Plotting Package for BASIC-PLUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAURENCE Runoff</td>
<td>System Utilities</td>
<td>330</td>
</tr>
<tr>
<td>LEADS-An Interactive</td>
<td>Data Management</td>
<td>12</td>
</tr>
<tr>
<td>Educational DBMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEX-11 Word Processing System</td>
<td>Data Management</td>
<td>14</td>
</tr>
<tr>
<td>LOGO for RSTS/E</td>
<td>Computer Science/</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>Languages</td>
<td></td>
</tr>
<tr>
<td>LP</td>
<td>Statistics</td>
<td>271</td>
</tr>
<tr>
<td>Management Case Studies</td>
<td>Business</td>
<td>94</td>
</tr>
<tr>
<td>MAPS-Financial Modelling and</td>
<td>Financial/</td>
<td>34</td>
</tr>
<tr>
<td>Planning</td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td>MESSAGE</td>
<td>Networks/</td>
<td>308</td>
</tr>
<tr>
<td></td>
<td>Communications</td>
<td></td>
</tr>
<tr>
<td>Software/Package</td>
<td>Category</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td>MICROGRAPHICS Management System</td>
<td>Data Management</td>
<td>15</td>
</tr>
<tr>
<td>MICROSIM</td>
<td>Computer Science/Languages</td>
<td>136</td>
</tr>
<tr>
<td>MICROSOLVE</td>
<td>Engineering</td>
<td>168</td>
</tr>
<tr>
<td>Middlebury College Utilities and Plotting Package</td>
<td>Graphics</td>
<td>292</td>
</tr>
<tr>
<td>MIGIT (Assembly Language Simulator)</td>
<td>Computer Science/Languages</td>
<td>138</td>
</tr>
<tr>
<td>MINI-DYNAMO</td>
<td>Computer Science/Languages</td>
<td>139</td>
</tr>
<tr>
<td>MINITAB Statistical Package</td>
<td>Statistics</td>
<td>272</td>
</tr>
<tr>
<td>NAG Library</td>
<td>Mathematics</td>
<td>200</td>
</tr>
<tr>
<td>NAMES &amp; CEMGEN (Computerized Question Generation)</td>
<td>CAI/CMI/CAT</td>
<td>123</td>
</tr>
<tr>
<td>NMRSIM: Nuclear Magnetic Resonance Simulation</td>
<td>Physical Science</td>
<td>224</td>
</tr>
<tr>
<td>Non-Parametric Regression</td>
<td>Statistics</td>
<td>274</td>
</tr>
<tr>
<td>North Country Union Admin. Software System</td>
<td>Data Management</td>
<td>16</td>
</tr>
<tr>
<td>NORTON (Astronomical Ephemeris Program Package)</td>
<td>Physical Science</td>
<td>225</td>
</tr>
<tr>
<td>OMSI PILOT-73</td>
<td>Computer Science/Languages</td>
<td>141</td>
</tr>
<tr>
<td>ORACLE</td>
<td>Data Management</td>
<td>17</td>
</tr>
<tr>
<td>Product</td>
<td>Equipment</td>
<td>Card Number</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>PDF</td>
<td>Statistics</td>
<td>275</td>
</tr>
<tr>
<td>Percentage Package</td>
<td>Mathematics</td>
<td>201</td>
</tr>
<tr>
<td>Phonetics and Comprehension Package</td>
<td>CAI/CMI/CAT</td>
<td>124</td>
</tr>
<tr>
<td>PLOT 11</td>
<td>Graphics</td>
<td>298</td>
</tr>
<tr>
<td>PLOT 10 Easy Graphing</td>
<td>Graphics</td>
<td>296</td>
</tr>
<tr>
<td>POISE</td>
<td>Data Management</td>
<td>18</td>
</tr>
<tr>
<td>QEI Attendance Reporting System</td>
<td>Student Records</td>
<td>61</td>
</tr>
<tr>
<td>QEI Automated Student Scheduling System</td>
<td>Student Records</td>
<td>63</td>
</tr>
<tr>
<td>QEI Grade Reporting System</td>
<td>Student Records</td>
<td>65</td>
</tr>
<tr>
<td>QEI Student Record Information System</td>
<td>Student Records</td>
<td>67</td>
</tr>
<tr>
<td>RABBIT-1 Computer Resource, Accounting and Billing</td>
<td>System Utilities</td>
<td>333</td>
</tr>
<tr>
<td>RABBIT-2 System Performance Analysis</td>
<td>System Utilities</td>
<td>335</td>
</tr>
<tr>
<td>RABBIT-3 Job Accounting and Performance Monitoring</td>
<td>System Utilities</td>
<td>336</td>
</tr>
<tr>
<td>RABBIT-4 Security System for Data Files</td>
<td>System Utilities</td>
<td>337</td>
</tr>
<tr>
<td>RAP-Relational Applications Processor</td>
<td>Data Management</td>
<td>20</td>
</tr>
<tr>
<td>Package</td>
<td>Category</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td>READING Package</td>
<td>CAI/CMI/CAT</td>
<td>126</td>
</tr>
<tr>
<td>REDAC</td>
<td>Graphics</td>
<td>299</td>
</tr>
<tr>
<td>Riverdale Math Package</td>
<td>Mathematics</td>
<td>203</td>
</tr>
<tr>
<td>RJ-11 COBOL</td>
<td>Computer Science/Languages</td>
<td>142</td>
</tr>
<tr>
<td>ROGALGOL</td>
<td>Computer Science/Languages</td>
<td>144</td>
</tr>
<tr>
<td>ROTATE, POLY, PLOT 10, XYPLOT</td>
<td>Graphics</td>
<td>300</td>
</tr>
<tr>
<td>1401 Simulator</td>
<td>System Utilities</td>
<td>342</td>
</tr>
<tr>
<td>SADSM, (Minicomputer Simulation)</td>
<td>Computer Science/Languages</td>
<td>146</td>
</tr>
<tr>
<td>School Fiscal Accounting Package</td>
<td>Financial/Facilities</td>
<td>35</td>
</tr>
<tr>
<td>School Payroll Package</td>
<td>Financial/Facilities</td>
<td>36</td>
</tr>
<tr>
<td>School Student Accounting Package</td>
<td>Student Records</td>
<td>69</td>
</tr>
<tr>
<td>Scientific Subroutine Package</td>
<td>Statistics</td>
<td>278</td>
</tr>
<tr>
<td>SEARCH: Sequential File Access Program</td>
<td>Library</td>
<td>46</td>
</tr>
<tr>
<td>Seattle Pacific Registration System</td>
<td>Student Records</td>
<td>70</td>
</tr>
<tr>
<td>Software Description</td>
<td>Subject Area</td>
<td>Page Number</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>SHARABLE HASP and UT200 Emulations</td>
<td>Networks/Communications</td>
<td>311</td>
</tr>
<tr>
<td>Shelf/Floor Space Analysis (Marketing)</td>
<td>Business</td>
<td>95</td>
</tr>
<tr>
<td>SIGI</td>
<td>Guidance</td>
<td>43</td>
</tr>
<tr>
<td>Signed Number Arithmetic Package</td>
<td>Mathematics</td>
<td>205</td>
</tr>
<tr>
<td>SI/MICRO</td>
<td>System Utilities</td>
<td>340</td>
</tr>
<tr>
<td>SOLVE: Southeastern Online Enrollment</td>
<td>Student Records</td>
<td>72</td>
</tr>
<tr>
<td>SOS-II Editing System</td>
<td>System Utilities</td>
<td>344</td>
</tr>
<tr>
<td>SPITBOL</td>
<td>Computer Science/Languages</td>
<td>150</td>
</tr>
<tr>
<td>SP/K (A System for Teaching Computer Programming)</td>
<td>Computer Science/Languages</td>
<td>151</td>
</tr>
<tr>
<td>SPPLT (Hybrid Orbital Contour Plotting Program)</td>
<td>Physical Science</td>
<td>230</td>
</tr>
<tr>
<td>SPRING THING (Wave Motion Simulation)</td>
<td>Physical Science</td>
<td>231</td>
</tr>
<tr>
<td>SPSS-11</td>
<td>Statistics</td>
<td>281</td>
</tr>
<tr>
<td>STAT 11</td>
<td>Statistics</td>
<td>282</td>
</tr>
<tr>
<td>STAT, Version 8C.03</td>
<td>Statistics</td>
<td>284</td>
</tr>
<tr>
<td>STRIDE (Reading Skills Program)</td>
<td>CAI/CMI/CAT</td>
<td>127</td>
</tr>
<tr>
<td>SYSTEMS ELEVEN-Attendance</td>
<td>Student Records</td>
<td>73</td>
</tr>
<tr>
<td>System</td>
<td>Department</td>
<td>Page</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------</td>
<td>------</td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>74</td>
</tr>
<tr>
<td>ELEVEN-Grade Reporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Financial/ Facilities</td>
<td>37</td>
</tr>
<tr>
<td>ELEVEN-Payroll</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Financial/ Facilities</td>
<td>38</td>
</tr>
<tr>
<td>ELEVEN-Personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Financial/ Facilities</td>
<td>39</td>
</tr>
<tr>
<td>ELEVEN-PPBS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>75</td>
</tr>
<tr>
<td>ELEVEN-Registration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>76</td>
</tr>
<tr>
<td>ELEVEN-Scheduling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-ASK</td>
<td>Data Management</td>
<td>26</td>
</tr>
<tr>
<td>TOTAL</td>
<td>Data Management</td>
<td>27</td>
</tr>
<tr>
<td>TUTOR</td>
<td>Computer Science/ Languages</td>
<td>153</td>
</tr>
<tr>
<td>ULISYS (Library Circulation System)</td>
<td>Library</td>
<td>47</td>
</tr>
<tr>
<td>UT200 Box</td>
<td>Networks/ Communications</td>
<td>313</td>
</tr>
<tr>
<td>Wabash College Admin. Software Package</td>
<td>Data Management</td>
<td>28</td>
</tr>
<tr>
<td>WATBOL-11 (Waterloo COBOL Compiler)</td>
<td>Computer Science/ Languages</td>
<td>154</td>
</tr>
<tr>
<td>WATFAC Utilities</td>
<td>Computer Science/ Languages</td>
<td>158</td>
</tr>
<tr>
<td>WATFOR-11 (Waterloo FORTRAN Compiler)</td>
<td>Computer Science/ Languages</td>
<td>160</td>
</tr>
<tr>
<td>Software</td>
<td>Department</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------</td>
<td>------</td>
</tr>
<tr>
<td>WIDJET: Waterloo Interactive Debugging Job Entry Terminal System</td>
<td>System Utilities</td>
<td>345</td>
</tr>
<tr>
<td>WRIST: Wabash Research Investigation Simulation Teacher</td>
<td>Social Science</td>
<td>250</td>
</tr>
<tr>
<td>XPACK</td>
<td>System Utilities</td>
<td>346</td>
</tr>
<tr>
<td>XYPLOT</td>
<td>Statistics</td>
<td>287</td>
</tr>
</tbody>
</table>

(Note: Also check the index for "Operating System Independent" Software.)
<table>
<thead>
<tr>
<th>ENTRY INDEX BY OPERATING SYSTEM</th>
<th>Application Area</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAX/VMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACSL-Advanced Continuous</td>
<td>Computer Science/</td>
<td>128</td>
</tr>
<tr>
<td>Simulation Language</td>
<td>Languages</td>
<td></td>
</tr>
<tr>
<td>AID</td>
<td>Engineering</td>
<td>162</td>
</tr>
<tr>
<td>APAS-Array Processor Application</td>
<td>Computer Science/</td>
<td>131</td>
</tr>
<tr>
<td>Software</td>
<td>Languages</td>
<td></td>
</tr>
<tr>
<td>BAS (VAX Budgetary Accounting</td>
<td>Financial/Facilities</td>
<td>29</td>
</tr>
<tr>
<td>System)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BASIS</td>
<td>Data Management</td>
<td>4</td>
</tr>
<tr>
<td>BMDP</td>
<td>Statistics</td>
<td>253</td>
</tr>
<tr>
<td>BSO/ICECNV</td>
<td>System Utilities</td>
<td>317</td>
</tr>
<tr>
<td>BSO/OBJCNV</td>
<td>System Utilities</td>
<td>318</td>
</tr>
<tr>
<td>BSO/PASCAL</td>
<td>System Utilities</td>
<td>319</td>
</tr>
<tr>
<td>CADA Monitor-Computer-Assisted Data Analysis</td>
<td>Statistics</td>
<td>254</td>
</tr>
<tr>
<td>CA/MICRO</td>
<td>System Utilities</td>
<td>321</td>
</tr>
<tr>
<td>CL/MICRO</td>
<td>System Utilities</td>
<td>323</td>
</tr>
<tr>
<td>CY/MICRO</td>
<td>System Utilities</td>
<td>324</td>
</tr>
<tr>
<td>DACS-Data Acquisition and Conversion System</td>
<td>Engineering</td>
<td>163</td>
</tr>
<tr>
<td>DATA BOSS/32</td>
<td>Data Management</td>
<td>7</td>
</tr>
<tr>
<td>DATACHECK</td>
<td>Statistics</td>
<td>262</td>
</tr>
<tr>
<td>DX (Document Exchange Utility)</td>
<td>System Utilities</td>
<td>328</td>
</tr>
<tr>
<td>Software</td>
<td>Field</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------</td>
<td>------</td>
</tr>
<tr>
<td>EASY ENTRY DATA SYSTEM</td>
<td>Data Management</td>
<td>9</td>
</tr>
<tr>
<td>GENSTAT</td>
<td>Statistics</td>
<td>268</td>
</tr>
<tr>
<td>GLIM-3</td>
<td>Statistics</td>
<td>270</td>
</tr>
<tr>
<td>GPSS (General Purpose Simulation System)</td>
<td>Engineering</td>
<td>165</td>
</tr>
<tr>
<td>GTSTRUDL</td>
<td>Engineering</td>
<td>166</td>
</tr>
<tr>
<td>HARVEST</td>
<td>Data Management</td>
<td>10</td>
</tr>
<tr>
<td>HASP</td>
<td>Networks/Communications</td>
<td>306</td>
</tr>
<tr>
<td>HASPBOX</td>
<td>Networks/Communications</td>
<td>304</td>
</tr>
<tr>
<td>IDA: Interactive Data Analysis and Forecasting System</td>
<td>Business</td>
<td>92</td>
</tr>
<tr>
<td>ILS: Interactive Laboratory System</td>
<td>Physical Science</td>
<td>222</td>
</tr>
<tr>
<td>IMSL Library</td>
<td>Mathematics</td>
<td>199</td>
</tr>
<tr>
<td>INTAC</td>
<td>Data Management</td>
<td>11</td>
</tr>
<tr>
<td>LEX-11 Word Processing System</td>
<td>Data Management</td>
<td>14</td>
</tr>
<tr>
<td>LP</td>
<td>Statistics</td>
<td>271</td>
</tr>
<tr>
<td>MAPS-Financial Modelling and Planning</td>
<td>Financial/Facilities</td>
<td>34</td>
</tr>
<tr>
<td>MICROSIM</td>
<td>Computer Science/Languages</td>
<td>136</td>
</tr>
<tr>
<td>MICROSOVE</td>
<td>Engineering</td>
<td>168</td>
</tr>
<tr>
<td>MINI-DYNAMO</td>
<td>Computer Science/Languages</td>
<td>139</td>
</tr>
<tr>
<td>MINITAB Statistical Package</td>
<td>Statistics</td>
<td>272</td>
</tr>
<tr>
<td>MSC/NASTRAN</td>
<td>Engineering</td>
<td>169</td>
</tr>
<tr>
<td>Program</td>
<td>Category</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------</td>
<td>------</td>
</tr>
<tr>
<td>MULTI-PICTURE SYSTEM</td>
<td>Graphics</td>
<td>294</td>
</tr>
<tr>
<td>MUX200/VAX Multiterminal Emulator</td>
<td>Networks/ Communications</td>
<td>309</td>
</tr>
<tr>
<td>NAG Library</td>
<td>Mathematics</td>
<td>200</td>
</tr>
<tr>
<td>ORACLE</td>
<td>Data Management</td>
<td>17</td>
</tr>
<tr>
<td>PACS Process Accounting and Chargeback System</td>
<td>System Utilities</td>
<td>331</td>
</tr>
<tr>
<td>PAFEC 75: Program for Automatic Finite Element Calculations</td>
<td>Engineering</td>
<td>170</td>
</tr>
<tr>
<td>PLOT 10 Terminal Control System</td>
<td>Graphics</td>
<td>297</td>
</tr>
<tr>
<td>POISE</td>
<td>Data Management</td>
<td>18</td>
</tr>
<tr>
<td>P-Stat 78</td>
<td>Statistics</td>
<td>276</td>
</tr>
<tr>
<td>RABBIT-1-Computer Resource, Accounting and Billing</td>
<td>System Utilities</td>
<td>333</td>
</tr>
<tr>
<td>RABBIT-2-System Performance Analysis</td>
<td>System Utilities</td>
<td>335</td>
</tr>
<tr>
<td>RAP-Relational Applications Processor</td>
<td>Data Management</td>
<td>20</td>
</tr>
<tr>
<td>REDAC</td>
<td>Graphics</td>
<td>299</td>
</tr>
<tr>
<td>REDOC-An Interactive Document Retrieval System</td>
<td>Data Management</td>
<td>22</td>
</tr>
<tr>
<td>ROGALGOL</td>
<td>Computer Science/ Languages</td>
<td>144</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>S-ALGOL</td>
<td>Computer Science/Languages</td>
<td>147</td>
</tr>
<tr>
<td>SAP 6/7:</td>
<td>Engineering</td>
<td>171</td>
</tr>
<tr>
<td>Structural</td>
<td>Analysis Program</td>
<td></td>
</tr>
<tr>
<td>SCSS</td>
<td>Statistics</td>
<td>279</td>
</tr>
<tr>
<td>Conversational System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDRC Fatigue, Frame, Imp, Modal-Plus, SABBA, Superb</td>
<td>Engineering</td>
<td>175</td>
</tr>
<tr>
<td>SDRC Graphics System</td>
<td>Graphics</td>
<td>301</td>
</tr>
<tr>
<td>SDL</td>
<td>Engineering</td>
<td>174</td>
</tr>
<tr>
<td>SEED</td>
<td>Data Management</td>
<td>23</td>
</tr>
<tr>
<td>SIGI</td>
<td>Guidance</td>
<td>43</td>
</tr>
<tr>
<td>SI/MICRO</td>
<td>System Utilities</td>
<td>340</td>
</tr>
<tr>
<td>SIMSCRIPT II.5</td>
<td>Computer Science/Languages</td>
<td>149</td>
</tr>
<tr>
<td>SIR, Scientific Information Retrieval</td>
<td>Data Management</td>
<td>24</td>
</tr>
<tr>
<td>SHARABLE HASP And UT200 Emulations</td>
<td>Networks/Communications</td>
<td>311</td>
</tr>
<tr>
<td>SLAM II</td>
<td>Engineering</td>
<td>187</td>
</tr>
<tr>
<td>SPERRY</td>
<td>Networks/Communications</td>
<td>312</td>
</tr>
<tr>
<td>UNIVAC/NTR</td>
<td>Protocol Emulator</td>
<td></td>
</tr>
<tr>
<td>SPITBOL</td>
<td>Computer Science/Languages</td>
<td>150</td>
</tr>
<tr>
<td>SPSS</td>
<td>Social Science</td>
<td>248</td>
</tr>
<tr>
<td>STAT, Version 8C.03</td>
<td>Statistics</td>
<td>284</td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>73</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>----</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Attendance</td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>74</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Grade Reporting</td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Financial/</td>
<td>37</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td>Payroll</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Financial/</td>
<td>38</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Financial/</td>
<td>39</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td>PPBS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>75</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>SYSTEMS</td>
<td>Student Records</td>
<td>76</td>
</tr>
<tr>
<td>ELEVEN-</td>
<td>Scheduling</td>
<td></td>
</tr>
<tr>
<td>T-ASK</td>
<td>Data Management</td>
<td>26</td>
</tr>
<tr>
<td>TIME SERIES</td>
<td>Statistics</td>
<td>285</td>
</tr>
<tr>
<td>Package 3.5B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>Data Management</td>
<td>27</td>
</tr>
<tr>
<td>UT200BOX</td>
<td>Networks/</td>
<td>313</td>
</tr>
<tr>
<td></td>
<td>Communications</td>
<td></td>
</tr>
<tr>
<td>WATBOL-11</td>
<td>Computer Science/</td>
<td>154</td>
</tr>
<tr>
<td>(Waterloo COBOL Compiler)</td>
<td>Languages</td>
<td></td>
</tr>
<tr>
<td>WATFOR-11</td>
<td>Computer Science/</td>
<td>160</td>
</tr>
<tr>
<td>(Waterloo FORTRAN Compiler)</td>
<td>Languages</td>
<td></td>
</tr>
<tr>
<td>XYPLOT</td>
<td>Statistics</td>
<td>287</td>
</tr>
</tbody>
</table>

(Note: Also check the index for "Operating System Independent" software.)
<table>
<thead>
<tr>
<th>Operating System/ Independent*</th>
<th>Application Area</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BERTIE (Introductory Logic)</td>
<td>CAI/CMI/CAT</td>
<td>99</td>
</tr>
<tr>
<td>CANTRAN-11 Student Programming System</td>
<td>Computer Science/Languages</td>
<td>132</td>
</tr>
<tr>
<td>DEMO-GRAPHICS (Computer-Assisted Instruction In Population)</td>
<td>Social Science</td>
<td>236</td>
</tr>
<tr>
<td>DESCRIPTIVE Statistics Package</td>
<td>Statistics</td>
<td>266</td>
</tr>
<tr>
<td>ECOMSETS</td>
<td>CAI/CMI/CAT</td>
<td>113</td>
</tr>
<tr>
<td>ELEMENTARY Statistics Package</td>
<td>Statistics</td>
<td>267</td>
</tr>
<tr>
<td>GENIE (Mendelian Genetics Package)</td>
<td>Physical Science</td>
<td>213</td>
</tr>
<tr>
<td>IMSL Library</td>
<td>Mathematics</td>
<td>199</td>
</tr>
<tr>
<td>OPTIMAL LOCATION OF FACILITIES</td>
<td>Social Science</td>
<td>243</td>
</tr>
<tr>
<td>PHYSCHEM Programs</td>
<td>Physical Science</td>
<td>226</td>
</tr>
<tr>
<td>Physics Tutorial Package</td>
<td>Physical Science</td>
<td>229</td>
</tr>
<tr>
<td>PLOT</td>
<td>Graphics</td>
<td>295</td>
</tr>
<tr>
<td>POPGROW: Population Growth Package</td>
<td>Social Science</td>
<td>245</td>
</tr>
<tr>
<td>PSYCHOLOGICAL STATISTICS</td>
<td>Social Science</td>
<td>246</td>
</tr>
</tbody>
</table>
SURVEY Physical Science 232
SAMPLING
PACKAGE
TWODEPEP Mathematics 207

* These programs were designed for transportability. It is advisable to check the source language for applicability.
# TABLE OF CONTENTS

## GENERAL INFORMATION
- Introduction ................................................................. iii
- How to Use This Book .................................................. v
- Entry Index by Operating System ................................. viii

## I. ADMINISTRATIVE APPLICATIONS
### A. DATA MANAGEMENT
- ADBASE-M ................................................................. 1
- AMBASE ................................................................. 2
- BASIS ................................................................. 4
- DATA BOSS/2 ......................................................... 6
- DATA BOSS/32 ......................................................... 7
- DATA ENTRY SUBSYSTEM (DES) ....................................... 8
- EASY ENTRY DATA SYSTEM ........................................ 9
- HARVEST ............................................................... 10
- INTAC ................................................................. 11
- LEADS—An Interactive Educational DBMS ..................... 12
- LEX-11 ................................................................. 14
- Micrographics Management System (MMS) ...................... 15
- North Country Union Admin. Software System ............... 16
- ORACLE ............................................................... 17
- POISE: People Oriented Information System .................... 18
- RAP—Relational Applications Processor ......................... 20
- REDOC ............................................................... 22
- SEED (Self Explaining Extended DBMS) ......................... 23
- SIR, Scientific Information Retrieval ............................. 24
- T-ASK ................................................................. 26
- TOTAL ............................................................... 27
- Wabash College Admin. Software Package .................... 28

### B. FINANCIAL/FACILITIES
- BAS (Budgetary Accounting System) ............................ 29
- Bronx Community Registration System ......................... 30
- Energy Accounting System ........................................... 33
- MAPS—Financial Modelling and Planning ....................... 34
- School Fiscal Accounting Package ............................... 35
- School Payroll Package ............................................. 36
- SYSTEMS ELEVEN—Payroll ........................................ 37
- SYSTEMS ELEVEN—Personnel ..................................... 38
- SYSTEMS ELEVEN—PPBS .......................................... 39
C. GUIDANCE INFORMATION SYSTEMS
   Career Information System ........................................... 41
   GIS: Guidance Information System ............................... 42
   SIGI: Interactive Guidance and Information System .......... 43

D. LIBRARY
   CATCAR—Catalog Card Printer ....................................... 45
   SEARCH—Sequential File Access Program ....................... 46
   ULISYS—Library Circulation System .............................. 47

E. STUDENT RECORDS
   APPLIED EDUCATIONAL SYSTEMS
   Daily Attendance Accounting Package ........................... 48
   APPLIED EDUCATIONAL SYSTEMS
   Grade Reporting Package ........................................... 50
   APPLIED EDUCATIONAL SYSTEMS Scheduling Package .... 52
   APPLIED EDUCATIONAL SYSTEMS Test Scoring Package54
   DELTA Teacher Assistance Programs ............................. 55
   Educational Administration System (Version 2) ............. 56
   GRADES II ............................................................. 58
   HUNTINGTON I APPLICATION PROGRAMS—
   Teacher Assistance .................................................. 59
   QEI Attendance Reporting System ................................. 61
   QEI Automated Student Scheduling System ..................... 63
   QEI Grade Reporting System ....................................... 65
   QEI Student Record Information System/Master File ........ 67
   School Student Accounting Package .............................. 69
   Seattle Pacific Registration System .............................. 70
   SOLVE: Southeastern Online Version of Enrollment .......... 72
   SYSTEMS ELEVEN—Attendance ..................................... 73
   SYSTEMS ELEVEN—Grade Reporting ............................... 74
   SYSTEMS ELEVEN—Registration ................................... 75
   SYSTEMS ELEVEN—Scheduling .................................... 76
## II. INSTRUCTIONAL APPLICATIONS
### A. BUSINESS

<table>
<thead>
<tr>
<th>Software/Material</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentley College Accounting Package</td>
<td>79</td>
</tr>
<tr>
<td>Bentley Variety Package</td>
<td>80</td>
</tr>
<tr>
<td>CASTLE: Computer Accounting Lab Environment</td>
<td>81</td>
</tr>
<tr>
<td>Computer Assisted Instruction in Economics</td>
<td>83</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems—</td>
<td></td>
</tr>
<tr>
<td>Business Programs #1</td>
<td>84</td>
</tr>
<tr>
<td>DELTA Educational Computing Systems—</td>
<td></td>
</tr>
<tr>
<td>Business Programs #2</td>
<td>90</td>
</tr>
<tr>
<td>IDA Interactive Data Analysis and Forecasting System</td>
<td>92</td>
</tr>
<tr>
<td>INVSIM: Inventory Simulation</td>
<td>93</td>
</tr>
<tr>
<td>Management Case Studies</td>
<td>94</td>
</tr>
<tr>
<td>Shelf/Floor Space Analysis (Marketing)</td>
<td>95</td>
</tr>
</tbody>
</table>

### B. CAI/CMI/CAT

<table>
<thead>
<tr>
<th>Software/Material</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC's of CAI, 5th Edition</td>
<td>96</td>
</tr>
<tr>
<td>BASIC Tutor Programs</td>
<td>98</td>
</tr>
<tr>
<td>BERTIE (Introductory Logic)</td>
<td>99</td>
</tr>
<tr>
<td>CAI Package</td>
<td>100</td>
</tr>
<tr>
<td>CMI (Computer Managed Instruction)</td>
<td>101</td>
</tr>
<tr>
<td>Compendium of DECAL CAI Programs</td>
<td>103</td>
</tr>
<tr>
<td>COMPUTE: Computer Generated Arithmetic Materials</td>
<td>104</td>
</tr>
<tr>
<td>Computer Assisted Instruction in English</td>
<td>106</td>
</tr>
<tr>
<td>Computer Assisted Instruction in History</td>
<td>108</td>
</tr>
<tr>
<td>Conversational BASIC Programs</td>
<td>110</td>
</tr>
<tr>
<td>DECAL: Digital Equipment CAI Author Language</td>
<td>111</td>
</tr>
<tr>
<td>ECOMSETS</td>
<td>113</td>
</tr>
<tr>
<td>Elementary Level Instructional Package, Vol. I</td>
<td>114</td>
</tr>
<tr>
<td>EUX/I—English Usage Exercise 1</td>
<td>116</td>
</tr>
<tr>
<td>GENIE-Computer Generated Instructional Materials</td>
<td>118</td>
</tr>
<tr>
<td>GERMAN (Adjective Ending Game)</td>
<td>120</td>
</tr>
<tr>
<td>ICSP-Individualized Computational Skills Programs</td>
<td>121</td>
</tr>
<tr>
<td>INRAN, OUTRAN-Computerized Question Generation #2</td>
<td>122</td>
</tr>
<tr>
<td>NAMES &amp; CEMGEN-Computerized Question Generation</td>
<td>123</td>
</tr>
<tr>
<td>PHONETICS and COMPREHENSION Package</td>
<td>124</td>
</tr>
<tr>
<td>READING Package</td>
<td>126</td>
</tr>
<tr>
<td>STRIDE (Reading Skills Program)</td>
<td>127</td>
</tr>
</tbody>
</table>
C. COMPUTER SCIENCE/LANGUAGES

ACSL (Advanced Continuous Simulation Language) .......................... 128
Analog Computer Simulator ......................................................... 130
APAS-Array Processor Application Software ................................. 131
CANTRAN-11: Student Programming System ................................. 132
DELT A Educational Computing Systems-Data Processing .................. 133
EZMARK System for Educational Processing .................................. 134
LOGO for RSTS/E ....................................................................... 135
MICROSIM .................................................................................. 136
MIGIT (Assembly Language Simulator) .......................................... 138
MINI DYNAMO ............................................................................. 139
OMSI PILOT 73 ........................................................................... 141
RJ-11 COBOL ............................................................................... 142
ROGALGOL: (ALGOL-60 for the PDP-11) ......................................... 144
SADSM (Minicomputer Simulation) ................................................. 146
S-ALGOL ...................................................................................... 147
SIMSCRIPT II.5 ............................................................................. 149
SPITBOL ....................................................................................... 150
SP/K System for Teaching Computer Programming ....................... 151
TUTOR ......................................................................................... 153
WATBOL-11 (Waterloo COBOL Compiler) ..................................... 154
WATFAC Structured MACROS .................................................... 156
WATFAC Utilities ......................................................................... 158
WATFOR-11 (Waterloo FORTRAN Compiler) .................................. 160
D. ENGINEERING

AID .............................................................. 162
DACSS-Data Acquisition and Conversion System ........... 163
Engineering Science (CAL) Program Exchange ............. 164
GPSS (General Purpose Simulation System) ................. 165
GTSTRUDL ....................................................... 166
MICROSOLVE ................................................... 168
MSC/NASTRAN ................................................ 169
PAFEC 75: Program for Automatic Finite Element Calculations ........... 170
SAP 6/7: (Structural Analysis Program) ....................... 171
SDL ............................................................... 174
SDRC Fatigue ................................................... 175
SDRC Frame ..................................................... 177
SDRC Imp ........................................................ 179
SDRC Modal-Plus ............................................... 181
SDRC Sabba ..................................................... 183
SDRC Superb ................................................... 185
SLAM II .......................................................... 187

E. MATHEMATICS

Decimal Arithmetic Package .................................... 188
DELTA Educational Computing Systems-Mathematics Programs ........... 189
Elementary Level Instructional Package, Vol. II ............. 191
Elementary Instructional Package, Vol. III .................... 193
Fraction Package ................................................. 195
Huntington I Application Programs-Mathematics ............ 197
IMSL Library ...................................................... 199
NAG LIBRARY (Numerical Algorithms Group) ................. 200
Percentage Package ............................................. 201
Riverdale Math Package ......................................... 203
Signed Number Arithmetic Package ............................ 205
TWODEPEP ....................................................... 207

xxxi
F. PHYSICAL SCIENCE

DELTA Educational Computing Systems—
Electronics and Production-Oriented Programs ........ 208
FChart—Solar Energy Analysis ........................... 211
GENES (Genetic Calculations) ........................... 212
GENIE: Mendelian Genetics Package ....................... 213
Huntington I Simulation Programs-Biology ............... 215
Huntington I Simulation Programs-Chemistry .............. 217
Huntington I Simulation Programs-Earth Science ......... 219
Huntington I Simulation Programs-Physics ................. 220
ILS—Interactive Laboratory System ...................... 222
NMRSIM: Nuclear Magnetic Resonance Simulation ........ 224
NORTON: Astronomical Ephemeris Program Package ...... 225
PHYSCHEM Programs (Introductory Physics
and Chemistry) ............................................. 226
Physics Tutorial Package .................................. 229
SPPLT (Hybrid Orbital Contour Plotting Program) ........ 230
Spring Thing (Wave Motion Simulation) ................... 231
Survey Sampling Package .................................. 232

G. SOCIAL SCIENCE

BASIC Application Programs—
Business/Social Studies ..................................... 233
Cognitive Psychology Laboratory .......................... 234
DEMO-GRAPHICS: Computer-Assisted Instruction
in Population ............................................... 236
DEPRESS ..................................................... 238
ECPRESS ...................................................... 240
Huntington I Simulation Programs-Social Studies .......... 241
Optimal Location of Facilities .............................. 243
POPGROW: Population Growth Package ................... 245
Psychological Statistics .................................... 246
SPSS-Statistical Package for the Social Sciences ......... 248
WRIST-Wabash Research Investigation
Simulation Teacher .......................................... 250
H. STATISTICS

BMDP (PDP-11 Version) ........................................... 251
BMDP (VAX-11/780 Version) ................................... 253
CADA Monitor-Computer-Assisted Data Analysis .......... 254
CASANOVA Package ................................................. 256
COSAP-Conversationally-Oriented Statistical Analysis Package .......... 257
Dartmouth Statistics Programs .................................. 259
DATACHECK ......................................................... 262
DELTA Educational Computing Systems-
Statistics Programs .............................................. 263
Descriptive Statistics Package .................................. 266
Elementary Statistics Package ................................... 267
GENSTAT ............................................................ 268
GLIM-3 ............................................................... 270
LP ................................................................. 271
MINITAB Statistical Package ..................................... 272
Non-Parametric Regression ....................................... 274
PDF ............................................................... 275
P-STAT 78 ......................................................... 276
Scientific Subroutine Package .................................... 278
SCSS™ Conversational System .................................... 279
SPSS-11 ............................................................ 281
STAT 11 ............................................................. 282
STAT, Version 8C.03 ............................................... 284
TIME SERIES Package 3.5B ...................................... 285
XYPLOT ............................................................. 287

III. UTILITIES

A. GRAPHICS

GRAPAK: Graph Package ........................................... 289
Lawrence Plotting Package for BASIC-PLUS .................. 290
Middlebury College Utilities and Plotting Package ....... 292
MULTI-PICTURE SYSTEM (MPS) .................................. 294
PLOT ............................................................... 295
PLOT 10 Easy Graphing ........................................... 296
PLOT 10 Terminal Control System .............................. 297
PLOT 11 ............................................................. 298
REDAC Mini PCB Design System .................................. 299
ROTATE, POLY, PLOT 10, XYPLOT ............................ 300
SDRC Graphics System ............................................. 301
B. NETWORKS/COMMUNICATIONS

BURCOM-11 DEC/BURROUGHS Communication System .................................................. 303
HASPBOX ......................................................... 304
HASP-Multileaving RJE Work Station ................................................................. 306
MESSAGE ............................................................... 308
MUX200/VAX Multiterminal Emulator ................................................................. 309
SHARABLE HASP and UT200 Emulations ...................................................... 311
SPERRY UNIVAC/NTR Protocol Emulator ....................................................... 312
UT200 BOX ............................................................ 313

C. SYSTEM UTILITIES

ACCRPT, ALPCAT, FIRST .................................................. 315
BASIC: Dartmouth BASIC to BASIC-PLUS Text Editor ........................................ 316
BSO/ICECNV Intel Symbolic Format Conversion ............................................. 317
BSO/OBJCNV Format Conversion Program ..................................................... 318
BSO/PASCAL Microprocessor Compiler .......................................................... 319
CA/MICRO ............................................................. 321
CL/MICRO .............................................................. 323
CY/MICRO ............................................................. 324
DREAMS: An Electronic Mail System ............................................................ 326
(DX) Document Exchange Utility ................................................................. 328
Lawrence RUNOFF .................................................... 330
PACS Process Accounting and Chargeback System ....................................... 331
RABBIT-1 Computer Resource, Accounting, and Billing ................................ 333
RABBIT-2 System Performance Analysis ..................................................... 335
RABBIT-3 Job Accounting and Performance Monitoring .............................. 336
RABBIT-4 Security System For Data Files ................................................... 337
SI/MICRO ................................................................. 340
1401 Simulator .............................................................. 342
1401 Simulator (RSTS/E Version) ................................................................. 343
SOS-11: Editing System .......................................................... 344
WIDJET (Waterloo Interactive Debugging Job Entry Terminal System) ............ 345
XPACK ................................................................. 346

APPENDIX A: PROGRAM DEVELOPMENT AND TRANSFER ...... 347

APPENDIX B: ADDITIONAL SOFTWARE REFERENCES ...... 351

FORMS ................................................................. 355
Application: Data Management

ADABAS-M

Description:
ADABAS-M is a real-time Database Management System that facilitates ease of use, flexibility and efficiency. The ADABAS-M system is dictionary driven in that all user interaction is by way of named files, fields and user views defined in the dictionary. Interactive utilities are included for dictionary creation, maintenance and reporting. ADABAS-M is an inverted index system. The multi-thread architecture, shared buffer pool and priority dispatching ensure high volume concurrent access. ADABAS-M supports a database of multiple files, with multi-key access. Users may interact with the system either by calls from online or batch programs or from terminals using the ADAScript-M query facility. Data protection includes automatic warm restart, record-level lockout to avoid interlock and concurrent updates, save/restore utilities and logging.

ADABAS-M includes an already established worldwide technical support organization, educational and documentation facilities.

Minimum Educational Level:
All

Language:
BASIC-PLUS-2

Operating System:
VAX/VMS, RSX-11M, RSX-11D

Developed By:
Sunday Lewis
Software AG of North America, Inc.
11800 Sunrise Valley Drive
Reston, Virginia 22091

Availability:
Contact developer at the above address or telephone: (703) 860-5050.
AMBASE

Description:
AMBASE is a highly comprehensive, interactive DBMS. Available in BASIC-PLUS-2, AMBASE is a revolutionary state of the art DBMS tool designed for the PDP-11 family of computers. AMBASE is designed with the human element in mind (extremely user oriented).

Features include: SCHEMA control and dependency (all system and data definitions maintained in a single location) subschema librarian; data access with common protocol (standard, preset method of data manipulation controlled by AMBASE, resulting in easier coding and maintenance tasks for programmers); handles large, complex data requirements (schema controls up to 294 data sets with each data set supporting up to 4.3 billion bytes of data and accommodating three record formats; 882 different record formats available in a database; 128 field definitions accommodated per record format; each data set supports 42 dynamic indexes; completely restartable; generalized Inquiry Language and Report Generation modules — designed for semi-technical people; Screen Format Generation Module; comprehensive set of 23 AMBASE Utilities to make the application programmers job easier; password security maintained to the format level; simultaneous, multiuser processing and contention supported and handled by AMBASE without application programmer intervention; supports random retrieval, list processing, generic and partial key searches; 15 field packing techniques available for better hardware resource utilization; provides complete data independence allowing data to be redefined without reprogramming (saves time and money);

Minimum Educational Level:
All

Language:
BASIC-PLUS-2

Operating System:
RSTS/E

Developed By:
Research and Development
Amcor Computer Corp.
1900 Plantside Drive
Louisville, Kentucky 40299
Availability:
Contact developer at the above address or telephone: (502) 491-9820.
BASIS

Description:
BASIS is a Data Management System (DMS) developed and distributed by Battelle Memorial Institute. It has many user oriented features that have been integrated into a self-contained system. With BASIS, the user has the ability to define new applications and to begin loading data within a few days, without the assistance of computer programmers. In addition, BASIS provides full ANSI standard thesaurus capabilities, procedure files to capture user's interactions, an online report writer, an online data entry processor, and online sorting capabilities.

BASIS can perform searches either through the use of an inverted index or through the use of the actual data records. Although the first is more efficient, the second provides the user with a great deal of flexibility. In addition to providing a fast, efficient manner for entering search terms, BASIS permits the user to perform proximity searching, search on numeric ranges, scan the text records for terms, use prefix searches, map related fields together, perform hierarchical and universe searches, and use the full complement of Boolean logic on retrieved document sets. BASIS also has the capability to handle multilingual applications, alphanumeric data, and very small or very large data bases. Through OLIVE, its online input, verification and edit component, the user has immediate access to the data base for the purpose of adding, deleting, or modifying data base records.

BASIS applications have ranged from chemical data bases to data bases dealing with aircraft safety, laboratory animal data, and mental health.

BASIS has current sites in the U.S., Canada, Europe and Japan.

Minimum Education Level: All

Language: FORTRAN

Operating System: VAX/VMS

Developed By: Battelle Memorial Institute
For Further Information Contact:

**USA—**
Battelle Columbus Labs
BASIS Coordinator
505 King Avenue
Columbus, Ohio 43201
(614) 424-5524

**Europe—**
Battelle Geneva
BASIS Coordinator
7, route de Drize
1227 Carouge-Geneva
Switzerland
(022) 43 98 31

**USA—**
Battelle Columbus Labs
Washington Office
BASIS Coordinator
8330 Old Courthouse Road
Vienna, Virginia 22180
(703) 790-8980

**FAR EAST—**
Mitsubishi Corporation
BASIS Coordinator
C.P.O. Box 22
Tokyo 900-91
Japan
TOKYO (03) 2121

**Europe—**
Battelle-Institut e.V.
BASIS Coordinator
Am Romerhof 35
6000 Frankfurt 90
West Germany
(611) 79082784 or 79082776
DATA BOSS/2

Description:
DATA BOSS/2 is a completely conversational Database Management System designed for the Digital Equipment Corporation PDP-11 and RSTS/E operating system utilizing a multiple key structure. All fields of a database can be keys providing immediate access in handling extremely large databases (8 RP06's) or larger.

DATA BOSS/2 is easily customized; contains its own special English-like inquiry language with logical operators; forces system documentation via a Generalized Applications Monitor. System allows multi-level password protection; up to 63 simultaneous users of the same database and requires no programming to use it.

The database can be logically designed as a Relational, Network, or Hierarchical structure. Logical equivalents of sequential, indexed sequential; direct random and inverted access are available.

It can include optional Data Entry and Report Writer capabilities.

Minimum Education Level:
None

Language:
BASIC-PLUS-2

Operating System:
RSTS/E, RSX-11M

Developed By:
Florida Computer Inc.
99 N.W. 183rd Street
No. Miami, Florida 33196

Availability:
Contact John H. Wright at Florida Computer Inc. or telephone: (305) 652-1710.
Application: Data Management

DATA BOSS/32

Description:
DATA BOSS/32 is a Database Management System for Digital's VAX-11/780 system operating in a VAX/VMS environment. The package is written in FORTRAN. User interactions with the system are usually effected by utilization of standard utilities or user written programs.

The package maintains multilevel tree structured inverted key file(s), and master record addresses are automatically appended and maintained in these sequences.

Database definition is accomplished interactively through a relatively simple process in which DATA BOSS/32 requests a definition for each field. The user responds with the field name and field attributes.

Data manipulation can accomplished by interaction with standard utility programs which are accessed through a standardized menu system called the “application monitor”. User written programs also can retrieve and update data. These user programs can also be included in the menu system for easy user access. Also available on VAX-11/750.

Minimum Education Level:
None

Language:
FORTRAN IV

Operating System:
VAX/VMS

Developed By:
Florida Computer, Inc.
99 North West 183rd Street
North Miami, Florida 33169

Availability:
Contact John H. Wright at Florida Computer, Inc. or telephone: (305) 652-1710.
Application: Data Management

DATA ENTRY SUBSYSTEM (DES)

Description:
DES is a conversational Data Entry Subsystem for use in conjunction with Florida Computer's DATA BOSS/2 Database Management System. With DES, multiple data entry specifications called "formats" can be set up for any DATA BOSS/2 database(s). Within each format, users can set validation conditions and data defaults for each data field. DES features (optional) automatic updating of relating database files, upon completion of transaction entry. Database records may be entered, removed or changed during update. Operators need only remember a six character format name to initiate data entry and update.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Florida Computer Inc.
99 North West 183rd Street
North Miami, Florida 33169

Availability:
Contact John H. Wright at Florida Computer, Inc. or telephone: (305) 652-1710.
EASY ENTRY DATA SYSTEM

Description:
Easy Entry is a full-screen data entry system for DIGITAL's PDP-11 and VAX computers. An interactive screen editor permits the user to create and maintain his own library of forms which can then be used for data entry. During data entry, the required forms are displayed on the CRT terminal and the entry operator uses a "fill in the blanks" technique to complete the form.

A comprehensive set of functions may be performed on the input fields: various range and validity checks can be applied to the input; fields may default to values contingent on the values in other fields; and other forms may be requested.

The package can use any of the common CRT terminals. Additional terminal types require only the definition of certain control characters.

Minimum Education Level:
Secondary School

Language:
AIS-PL/I, but not required.

Operating System:
RSTS/E, VAX/VMS, RSX-11M

Developed By:
Applied Information Systems, Inc.
500 Eastowne Drive, Suite 207
Chapel Hill, N.C. 27514

Availability:
Contact developer directly at above address or telephone: (919) 942-7801.
HARVEST

Description:
International Data Base Systems, Inc.'s Harvest query language and report writer is now available in native mode for VAX/VMS. Harvest provides an English-like data base query language and a non-procedural report definition language that generates reports from data bases supported by Seed (IDBS's Codasyl-type data base manager).

Harvest allows definition of temporary variables; does arithmetic calculations; and provides automatic functions for total, maximum, minimum and average values for a field or a temporary field. The query language does the above with six commands (DISPLAY, LET, SHOW, REPORT, SET and EXIT). A WHERE command allows the user to designate the portion of the data base to be used in answering a query. In addition, users may define up to 20 customized FORTRAN functions.

Harvest automatically finds the optimum access path to needed records; the user does not need to know the data base structure.

Reports include page headings and footings, column and line labels, control breaks of up to 15 levels, automatic calculation of percentages of cumulative totals and a choice of lineprinter or terminal directed output.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
International Data Base Systems

Availability:
INTAC, INTERACTIVE DATABASE MANAGEMENT

Description:
INTAC is a data management and retrieval system. It is a powerful
decision-support tool developed to assist users in organizing and re-
porting the information they need to manage business. INTAC can be
used to develop and operate database/data retrieval systems for per-
sonnel information, lease equipment tracking, capital budgeting and
other areas where there is a requirement to maintain, sort, and re-
trieve data.

Using INTAC is simple. The user is provided with the interactive means
to manage data: define and create files, add, change, and delete re-
cords in the file, and perform all requisite utilities. A host language
interface is also included and full transaction processing is supported.

A significant portion of INTAC's development was devoted to methods
of reporting the stored information. This resulted in two techniques: an
interactive query language that a business person with no computer
experience can use to rapidly retrieve and analyze data, and a unique
report program generator that uses English-like specifications, and
provides an efficient method of developing reports that meet any
requirements.

Minimum Education Level:
All

Language:
BASIC-PLUS, BASIC-PLUS-2, VAX-11 BASIC

Operating System:
RSTS/E, VAX/VMS

Developed By:
Ross System, Inc.

Availability:
Contact Bill Homasmeyer, Marketing
Manager for Ross Systems, at:
1900 Embarcadero Road, # 208
Palo Alto, California 94303
(415) 856-1100
LEADS — AN INTERACTIVE EDUCATIONAL DBMS

Description:
LEADS is a working, well-documented interactive database management system specifically designed to meet the needs of public education. The system was conceived while attempting to deal with the real problems of data management in the public schools of Lexington, Mass.; was funded for thirty months under Title VI, Part B, through the Massachusetts Department of Education; was implemented entirely in BASIC-PLUS on a PDP-11/40 under RSTS/E V6B; has been completed; has been submitted to DECUS and is in the public domain; and is in daily use in the Lexington schools with remote terminals in several buildings. LEADS has been modified to be compatible with RSTS/E V7 and has been resubmitted to DECUS.

LEADS is a general purpose system in that the nature of the data and the data format are determined by the user. No portion of the database is predetermined or prestructured. Data relationships that accurately represent the rather complex relationships found in public education can be easily defined by the user. The system includes an especially powerful QUERY language, ISAM indices, a report writer language, and enormous flexibility in the creation and maintenance of the database structure. LEADS software is appropriate for:

- A single, large database containing all student, staff and financial data and all appropriate data relationships.
- A large RSTS/E system providing services to several school systems, as each system could have its own independent, secure database.
- Allowing any user to build his own mini-database for a special application. (e.g., curriculum materials management).
- Teaching database concepts, as each student can be manager of his own database and operate that database entirely on his own.

The LEADS software includes few restrictive parameters and several features found in the very good, very expensive commercially available DBMS packages. There are files, which are divided into records, which are divided into fields. Records can be related to other records using pointers and associators. Pointers permit "direct" access to the target record, whereas associators require one or more intermediate steps. Fields can be accessed sequentially or by using an optional ISAM Index. Inquiries can be nearly as complex as desired with little or no regard to the software boundaries of files and fields. Users can
make the most of their queries with no knowledge of the data structure. There is a multilevel security system that permits school systems to be as restrictive as they choose with their computer based data.

**Minimum Education Level:**
All

**Language:**
BASIC-PLUS

**Operating System:**
RSTS/E (Version 6B, 6C, or 7)

**Developed By:**
Software — Walter Koetke (Formerly with Lexington Public Schools)
Application — Frank DiGiammarino, Administrative Assistant for Planning, Lexington Public Schools, Lexington, Massachusetts (02173)

**Availability:**
DECUS (to members only)
Order # RSTS11-118 or from Lexington Public Schools
Lexington, Massachusetts 02173

For technical information —
Attention: William T. Spencer, Manager Lexington Computer Center

For application information —
Attention: Frank DiGiammarino, Administrative Assistant for Planning

A fee will be charged and the request must be accompanied by magnetic tape or RK05 disks. Allow for the following approximate file sizes:
System software and documents — 4500 blocks, 42 files
Sample applications programs (as used in Lexington) — 3000 blocks, 213 files
Demonstration database (as used in Lexington) — 11,000 blocks, 60 files
Application: Data Management

LEX-11 WORD PROCESSING SYSTEM

Description:
LEX-11 is a word processing system which can be used on all LSI-11, PDP-11, and VAX computer systems using a video terminal that has cursor addressing, and a letter quality or matrix printer. LEX-11 allows you to use the video screen to compose and edit text, with features you would expect to find on expensive standalone word processors. You may then print out the text in a variety of ways with automatic pagination and titling. In addition to its highly efficient document creating and editing facilities, LEX-11 contains a calculator feature, a forms mode facility, and full list processing features, which enable invoicing and mailing list applications to be carried out with ease.

System Features
Other features of the LEX-11 Word Processing System include: Video Screen, Menu Driven, Word Wrap, Rulers, Scroll, Cut and Paste, Search, Abbreviations, Record Listings, and Automatic Titling.

Minimum Education Level:
All

Language:
Relational Programming Language (RPL)

Operating System:
RSTS/E, VAX/VMS, RSX-11M, UNIX

Developed By:
ACE MICROSYSTEMS LTD.

Availability:
Eric Dickman
EEC Systems
286 Boston Post Road
Wayland, MA 01778
(617) 358-7781
MICROGRAPHICS MANAGEMENT SYSTEM (MMS)

Description:
Micrographics Management System (MMS) is for use with the DATA BOSS/2 Database Management System which runs on the PDP-11 (RSTS/E).

A terminal-oriented microfilm management indexing and retrieval system designed to be used by non-computer personnel. It is modular and customizable, and functions on large files. Users need no special training, and as many as 63 people can use the system simultaneously, each doing separate clerical functions. The command language enables users to update, expand, add, delete, and retrieve information from files through either local or remote terminals. There is an option to interface with micrographic display units to prove automatic retrieval.

This software enables the micrographic reader/printer to automatically select the correct cartridge and frame number and display it on a reader/printer. The system can support multiparameter searches on multiple databases through its English-like inquiry language.

Minimum Education Level:
None

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Florida Computer, Inc.
99 North West 183rd Street
North Miami, Florida 33169

Availability:
Contact John H. Wright at Florida Computer Inc. or telephone: (305) 652-1710.
APPLICATION: DATA MANAGEMENT

NORTH COUNTRY UNION ADMINISTRATIVE SOFTWARE SYSTEM

Description:
This package contains both financial and student accounting systems. The financial system includes accounts payable, expense ledger, and payroll; the student administrative system includes attendance accounting, grade reporting, and transcripts. The software runs on a PDP-11/20 with DECtape and RF/RS 11 disk, uses card input for all subsystems and an 80-column printer for output.

The programs are on two DECtapes, but may be ordered separately, if desired. If you want only the financial programs, request tape A. Request tape B to receive the student administrative programs separately. Write-up contains documentation for both tapes.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Steve Ketchum/John Miller
North Country Union High School
Newport, Vermont

Availability:
DECUS (to members only)
Order #RSTS11-46
Application: Data Management

ORACLE RELATIONAL DATABASE MANAGEMENT SYSTEM

Description:
ORACLE is the first commercially-proven Relational DBMS currently in use world-wide. ORACLE’s user interface is the SQL Relational Data Language. SQL is an English-like non-procedural language comprising Query, Data Manipulation, and Data Definition facilities. All SQL statements are available from online terminals as well as from programming languages such as COBOL, FORTRAN, etc. ORACLE is a high-performance system consisting of 100% reentrant code, allowing multiple online users to concurrently update or query one or more databases. By 1981 ORACLE was in use at over 60 sites in North America, Europe, Japan and Australia.

ORACLE features include:
• An Integrated Data Dictionary that centrally defines all information that is stored in the database.
• An Interactive Application Facility that allows the end-user to generate online data entry and data maintenance applications without the need for conventional programming.
• A combination Report Writer/Word Processor that allows formatted data from the database to be interleaved with formatted text within a single report.

Minimum Education Level:
All

Language:
C

Operating System:
RSTS/E, RSX-11, UNIX, VAX/VMS

Developed By:
Relational Software Inc.
3000 Sand Hill Road
Menlo Park, California 94025

Availability:
Contact developer directly at above address or telephone: (415) 854-7350
Application: Data Management

POISE: PEOPLE ORIENTED INFORMATION SYSTEM FOR EDUCATION

Description:
POISE specializes in administrative software for all levels of education—elementary, secondary, college, and university.

All POISE modules are based upon a self-contained user-oriented Data Management System with complete file maintenance, online inquiry and updating, screen formatting, information retrieval, file-to-file data transfer, versatile report generator, multi-purpose label generator, and word processing facilities. Installation, training, and documentation are included in cost. Video training cassettes are available for purchase.

The following modules are available in addition to the Data Management System:

College and University:
Admissions, Online Registration and Grade Reporting, Academic History, Student Billing/Receivables, Financial Aid Reporting, Alumni/Development, Fiscal Reporting, Payroll, Personnel, Inventory Control, Fixed Asset Accounting, and Library Services.

Elementary and Secondary:
Online Registration and Grade Reporting, Academic History, Computerized Scheduling, Attendance, District-Level Student Records, Fiscal Reporting, Payroll, Personnel, Inventory Control, Fixed Asset Accounting and Library Services.

Minimum Education Level:
All

Languages:
BASIC-PLUS or VAX-11 BASIC with source code provided.

Operating System:
RSTS/E or VAX/VMS

Developed By:
The POISE Company, Inc.
201 North Nevada
Roswell, New Mexico 88201
(505) 623-8554
Availability:
Contact developer directly.
Application: Data Management

RAP: RELATIONAL APPLICATIONS PROCESSOR

Description:
RAP is a database management software system which allows application programs to be written in BASIC-PLUS through the use of data management functions and utilities. It can handle up to 16,777,216 records, the first three (3) of which are reserved. RAP manipulates index files (random or sequential access) using calls like Add, Delete, Find, Jump, Open, Read, and Write. System utilities include Quest, Report Generation, Data Entry, Maintenance, etc. These utilities make system design easier in that fewer applications need be written. The RAP functions will work under BASIC-PLUS-2 for faster execution (this allows the user to debug applications under BASIC-PLUS, but use BASIC-PLUS-2, if desired, for production).

RAP allows for the relating of different user designed systems (the systems do not have to be contained in the same file). Security measures involve the normal protection codes (RSTS/E) for cross account manipulation, passwords for special relations, R-LOCK and W-LOCK on the key, and R-LOCK and W-LOCK on the fields.

Data types supported include ASCII text, 1-byte unsigned integer, 2- and 4-byte signed integers, 8-byte floating point, and mini-numbers (1 to 16 bits). Also, the ASCII text field type may be defined as a compound of sub-fields.

Minimum Education Level:
College and University (May be appropriate for some secondary school district sites.)

Language:
BASIC-PLUS, BASIC-PLUS-2

Operating System:
RSTS/E, VAX/VMS

Developed By:
Seattle Pacific University
Computer Services
3307 Third Avenue W
Seattle, WA 98119
Availability:
Contact developer directly.

For More Information:
See Seattle Pacific Registration System in the Student/Academic section. The Registration and all other applications were written under RAP.
Application: Data Management

REDOC — AN INTERACTIVE DOCUMENT RETRIEVAL SYSTEM

Description:
REDOC is an Information Retrieval System suitable for all classes of literature and documentation. It is based on the inverted file principle, whereby any words can be taken as keywords. The database is open ended for incremental updates.

It is completely programmed in FORTRAN.

REDOC consists of about 1500 FORTRAN statements and is divided into three subsystems:
• Database Establishment
• Interrogation of the Database
• Database Updates

Interrogation is performed in a multiuser, interactive environment. A test database (ACM computer literature) is provided to demonstrate the efficiency and variability of the system. A sample interrogation is provided.

The query commands are simple and a help file assists the inexperienced user.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
R.W. Lutz,
Max—Planck Institute fur Biochemie
D—8033 Martinsried
West Germany

Availability:
Contact developer directly at above address or telephone: (089) 8585/724
SEED DATABASE MANAGEMENT SYSTEM

Description:
SEED, the KERNEL of IDBS software, is a CODASYL-type dictionary-driven database management system that supports both network and hierarchical data structures. It permits database access from either COBOL or FORTRAN, and is written in a combination of FORTRAN and Assembler. The SEED Data Description Language describes the contents and structure of the database, value-based selection of sets, "aliases" for bill-of-materials structures, and variable-length fields and records. Any number of levels of hierarchy and almost boundless data networking are available.

The SEED DBMS includes HARVEST, a relational-like query language; BLOOM, a report writer; VISTA, a screen-oriented applications development tool. SPROUT, a transaction processor; and GARDEN, and interactive data manipulation language and data dictionary interface.

Minimum Education Level:
College or University

Language:
FORTRAN/Assembler

Operating System:
VAX/VMS

Developed By:
International Database Systems, Inc.
2300 Walnut Street
Philadelphia, PA 19103

Availability:
Grace Pierce
International Database Systems, Inc.
2300 Walnut Street
Philadelphia, PA 19103
(215) 568-2424
Application: Data Management

SIR, SCIENTIFIC INFORMATION RETRIEVAL

Description:
SIR, the Scientific Information Retrieval program, is a self-contained, fully-integrated, research-oriented data base management system. It has been successfully applied to a wide range of research projects in such diverse fields as clinical trials, cancer research, epidemiology, oceanography, criminology, virology, sociology, economics, pharmaceutical research, computer performance analysis, census data analysis and many others.

SIR is a friendly and flexible system. Among the features that make it particularly attractive to the researcher are:

- ease of installation, maintenance and use
- minimal computer resource requirements
- an easy-to-learn integrated programming language (no need for FORTRAN, COBOL, PL/I, etc)
- familiar, SPSS-like data definition (schema) commands
- direct interface with SPSS and BMDP
- census data processing

Some of the other important features of SIR include:

- support of complex hierarchical and network file structures
- multiple record types and non-rectangular data
- data editing, including range, value and consistency checking
- data security at the item and record level
- wide range of data entry and update options
- structured and comprehensive data retrieval language
- flexible, user-oriented interactive subsystem including a text editor, storage of user-defined procedures and an interactive retrieval processor
- automatic journal file creation for logging modifications to the data base
- complete documentation (six-hundred page user's manual)

Minimum Education Level:
None

Language:
FORTRAN with some Assembler
Operating System:
VAX/VMS

Developed By:
SIR, Inc.
P.O. Box 1404
Evanston, Illinois 60204

Availability:
For more information, please contact:
Ms. Irene Navickas at SIR, Inc. at the above address or telephone:
(312) 475-2314.
Application: Data Management

T-ASK

Description:
T-ASK is an online interactive query facility developed by Cincom Systems, Inc. for use with its database management system TOTAL. One of the major benefits of T-ASK is the English-like language on which the facility is based, enabling non-data processing professionals to retrieve the information they are seeking quickly and efficiently without programming.

T-ASK capabilities include:
- Navigation through a TOTAL database.
- A powerful command syntax that is easy to learn.
- Creation and retention of directory procedures for subsequent execution.
- Database security through the use of passwords.
- A standard set of arithmetic operations available to manipulate data and obtain derived fields.
- Three different data types: alphanumeric, numeric and date.
- Automatic formats and displays one screen at a time enabling the user to page forward to exit.
- Support of hard copy reporting.
- Maintenance mode which allows database to create aliases for TOTAL elements tailored for each end user.

Minimum Education Level:
All

Language:
ASSEMBLER

Operating System:
RSTS/E, VAX/VMS, RSX-11

Developed By:
Cincom Systems, Inc.
Marketing Services Dept.
2300 Montana Ave.
Cincinnati, Ohio 45211

Availability:
Contact the developer directly at the above address or telephone: (513) 662-2300.
Application: Data Management

TOTAL

Description:
TOTAL is a database management system (DBMS) from Cincom Systems, Inc. used for building sophisticated application systems. It combines networks and hierarchical data structures to provide non-redundant data organization within the computer. Minicomputer TOTAL is currently available on VAX systems and PDP-11s. It offers a choice of hierarchical, network, or multi-keyed access. An English-like query language, T-ASK (which is listed in this Data Management section of IDEAS), provides easy access and retrieval of data elements in the TOTAL database. TOTAL, which is operating on more than 38 different computer systems, is used extensively at installations worldwide.

Features include:
• Hierarchical and network data structures
• Portability
• Low Overhead Requirements
• Data Independence
• Data Security
• Transaction Level Recovery per Program
• Ease-of-Use
• Shadow Recording Facilities (optional)

Minimum Education Level:
All

Language:
ASSEMBLER

Operating System:
VAX/VMS, RSTS/E, RSX-11M, RSX-11M-PLUS

Developed By:
Cincom Systems, Inc.

Availability:
TOTAL is available from:
Cincom Systems, Inc.
Marketing Services Dept.
2300 Montana Ave.
Cincinnati, Ohio 45211
U.S.A.
Application: Data Management

WABASH COLLEGE ADMINISTRATIVE SOFTWARE PACKAGE

Description:
Wabash College has implemented all its nonfinancial data processing on its RSTS/E system in BASIC-PLUS. The main categories of data processing handled by the system include student registration, grade reporting, alumni and applicant record-keeping and reporting, and many types of mailings. Most file updating is done directly by the secretarial staff of the responsible office with a remote terminal. This affords each office served the opportunity to maintain protection for those files and reduces staff requirements at the Computer Center.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Dr. James Warden
Wabash College
Crawfordsville, Indiana

Availability:
DECUS (to members only)
Order #RSTS11-34
BAS (BUDGETARY ACCOUNTING SYSTEM)

Description:
BAS is an online accounting system that has been designed specifically for funded environments such as school boards, colleges, universities and municipalities.

The package incorporates the following integrated modules:- Purchase Order Management, Invoice Entry, Accounts Payable Processing, General Ledger & Reporting, Subledgers & Reporting, Budgeting, Vendor Information, and Balancing & Audit.

BAS is easily installed and user-customized through user definition of the GL Structure, GL Hierarchical Totalling Sequence, GL Report Resequencing, any number and types of Subledgers, Subledger Inquiries & Reports, as well as the number of Budget, Expense & Commitment periods.

BAS is simple to operate by local and remote user departments though menu driven programs and screen formatted data entry & inquiry.

Other software packages available from SRB include Online Payroll System (OPS) and Security Management System (SMS).

Minimum Education Level:
Secondary School

Language:
BASIC-PLUS-2 VAX-BASIC

Operating System:
VAX/VMS, RSTS/E

Developed By:
SRB International Ltd.
360 King St. W.
Oshawa, Ontario
Canada L1J 2K2

Availability:
Contact developer directly at above address or telephone: (416) 433-2100.
BRONX COMMUNITY COLLEGE REGISTRATION SYSTEM

Description:
The Bronx Community College Registration System is a unique method for registering, tallying, feeing, and reporting using a varied number of different devices simultaneously. Inputs are accepted from a remote card reader (under RSTS/E), a local hard-wired card reader, and various remote terminals, and placed on a spooling file for processing. Any combination of devices may be active. Outputs are spooled after processing for printing on a designated output device (i.e., local printer, remote printer, or terminal(s)). Transaction rate is approximately 16 per minute when all active devices are kept busy.

Student Registrations:
Initial registrations and program changes are handled in “online” mode.

Section closed notice: A warning notice is sent to a terminal at the registration site when there are only three seats left in a section. A “section closed” notice is sent when maximum class size has been reached.

Overtallies may be accepted upon presentation of an overtally card, issued only by a department chairperson.

Bypass: Students wishing to take more than 18 credits or more than eight courses, and who have obtained permission to do so, will be permitted to do so via a registrar’s bypass card entered into the computer.

Feeing: Fees to be paid by the student are automatically calculated as a function of the registration process. All financial aid awards which are applicable are deducted, leaving a “net fee” to be paid by the student.

Inquiry and Updating Features:
Inquire Mode: The student's record of registration as well as other pertinent information may be displayed by authorized individuals.

New Admissions: New students not yet on the Master File may be entered via remote terminals by the admissions office, thus enabling them to register, even on the day of admission.

Adjudication: Problems which may affect student registration may be handled dynamically, thus removing impediments which may no longer be valid. For example:
• Change of matriculation code
• Change of residence code
• Alter debarment flag

Financial Aid: All financial aid information received by the college up to the day before registration commences is placed on the Student Registration file. Because students apply late, and for numerous reasons beyond the control of the Financial Aid Officer, many awards may not have been forwarded to the college by this time. The system permits the Financial Aid Officer (only) to enter new awards or make changes to awards upon presentation of proof by the student.

Administrative Functions:
System checking: the system checks for
• Invalid student number
• Duplicate registration (rejected)
• Illegal add/drops (student not registered)
• Excessive number of courses
• Excessive credits

Registrar options:
• Increase/decrease maximum class size dynamically
• Close section before maximum has been reached
• Open section:
  new section (create)
  previously existing closed (below maximum) and cancelled sections

Detallying/Non-payment of Fees: The center prepares “general ledger,” “cash receipts,” and “accounts receivable” reports for the bursar. As an outgrowth of this reporting, students who have paid no fees may have all courses deleted from their file at the option of the bursar. This function greatly reduces uncollectable receivables and eliminates “padded” class sizes. Previously closed sections are opened as a by-product of this process.

Available Reports:
• Daily activity report
• Class size report
• Closed section report
• Notification of cancelled section (to student)
• Course load report
• Chairperson's override report
• Registrar's by-pass report
• Individual student record of registration, including fees

Language:
BASIC-PLUS

Operating System:
RSTS/E Version 6B

Developed By:
Computer Center
Bronx Community College
University Avenue and West 181st Street
Bronx, New York 10453

Meyer Shopkow, Director
(212) 367-7300

Availability:
Contact developer directly.
ENERGY ACCOUNTING SYSTEM

Description:
Energy Accounting System allows the student to monitor and estimate future energy costs. A Forecasting Module is available that enables the user to forecast energy usage based on estimates of energy costs, e.g., price per gal. of oil, price of gas, electricity, and steam, and degree days. This provides the user with a comprehensive basis to integrate Energy Budgeting with the present conventional budgeting system.

The System provides the following features:
1. Establish a on-going financial base for Energy Management Control.
2. Evaluate alternatives for effective Energy Conservation programs with absolute units, such as, BTU's, BTU/Gross Sq. Ft., and BTU/Gross Sq. Ft./Degree days.
3. Develop Energy Budgets based upon estimates of future energy usage, costs, and Degree days.

Minimum Education Level:
College

Language:
BASIC PLUS

Operating System:
RSTS/E

Developed By:
Omni Computer Systems
P.O. Box 162
Chestnut Hill, MA 02167

Availability:
Contact developer directly at above address or telephone: (617) 367-9000.
Application: Financial/Facilities

MAPS—FINANCIAL MODELLING AND PLANNING

Description:
MAPS is a financial modeling and reporting language. MAPS can be used to construct financial models, consolidations, budgets, financial analyses, financial statements, cash flow projections, and numerous other reports that utilize a tabular format to present and analyze data.

MAPS is easy to use. An individual needs no prior experience with computers or computer programming to achieve rapid, successful results with MAPS. More experienced users can choose from a wide variety of advanced features to develop complex reporting systems or more sophisticated financial models.

MAPS features its own database sub-system and can be linked to other systems to access and store data extracted from the general ledger. MAPS also features calculational capabilities, extensive “WHAT IF” analyses, including backwards iteration and sensitivity analysis, and a simplified yet flexible consolidation process.

Minimum Education Level:
All

Language:
BASIC-PLUS, BASIC-PLUS-2, VAX-11 BASIC

Operating System:
RSTS/E, VAX/VMS

Developed By:
Ross Systems, Inc.

Availability:
Contact Bill Homasmeyer, Marketing Manager for Ross Systems, at:
1900 Embarcadero Road, # 208
Palo Alto, California 94303
(415) 856-1100
SCHOOL FISCAL ACCOUNTING PACKAGE

Description:
This package performs the normal fiscal accounting applications of a school system. It is based on double entry bookkeeping and is a fully accrued and encumbered system of accounting. The system allows for the printing of accounts payable checks at any desired time. It is account code independent, but based on fund accounting. All checks are drawn on the general funds bank account and appropriate interfund entries are automatically posted. The system allows for the interactive entering of purchased orders, invoices, handwritten checks, general journals, cash receipts, bank deposits, accounts receivable invoices, journal vouchers, and budget. The general ledger is immediately updated and inquiry can be made into any set of general ledger accounts for balances, month-to-date detail or year-to-date detail. Various reports can be pulled from the system including various formats of budget and expenditure reports. The system is menu-driven and has an auto-queue feature. It contains a cost accounting system.

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490

Availability:
Contact developer directly.
SCHOOL PAYROLL PACKAGE

Description:
This is a package of about 75 programs designed to handle an educational institute’s payroll. The payroll package is part of a fully accrued and encumbered system of accounting. The package makes three types of payments: time card payments, daily rate payments (for substitute teachers), and contract payments. Contracts are accrued. Many staff accounting features are also included in the package. Sick leave and vacation and other types of leave are accounted for in the package. Automatic deductions are made if a certain type of leave is exceeded. Year-to-date data is kept for printing of 941 and W-2 forms. Teachers’ salary schedules and their placement on those schedules are stored; contracts are printed and projections are made in costing various salary schedules for negotiations. The package prints the payroll checks as well as many supporting reports. Some of the reports are: batch listings of time cards, substitute cards and adjustments, payroll summary, check register, leave report, supplementary payroll reports, analysis of contracts, payroll journal, payroll recap, year-to-date report, deduction register, insurance registees, retirement report, employee data sheets, and gummed labels of various sorts. The payroll uses an account code number of 16 digits. The package is totally terminal-oriented and can be run from a remote terminal. The package is menu-driven and has an auto-queue feature. It contains a cost accounting system.

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho
(208) 522-7490

Availability:
Contact developer directly.
SYSTEMS ELEVEN—PAYROLL

Description:
The PYRL System is a comprehensive system designed to accommodate the many variations found in this complex school/municipal application. Variable pay cycles may be defined by the user. Deductions and tax shelters are also defined. These may be percentages or fixed amounts of gross pay, net pay, or a subset of either. Multiple pay rates of salary amounts may be assigned to any single employee. F.I.C.A. and/or other pension plans are calculated on a per day pay rate basis. Distribution of gross wages may be done by percentage of gross pay or by separate pay rates. Multiple distribution accounts may be assigned to each pay rate. The system determines F.I.T., S.I.T., and C.I.T. using a table calculation method. Monthly, quarterly, and yearly reports are provided. All interaction is online.

Language:
BASIC-PLUS and BASIC-PLUS-2

Operating System:
RSTS/E and VAX/VMS

Developed By:
Systems Eleven, Inc.
P.O. Box 105
Southbury, Connecticut 06488
(203) 264-3286

Availability:
Contact developer directly.
SYSTEMS ELEVEN — PERSONNEL
PRSN is a comprehensive personnel system designed specifically for use by schools and municipals agencies. It contains demo-graphic information, education background, medical information, and work experience. Certification status and assignment areas are recorded for the professional staff. Salary and benefit status aid in negotiations and projections. Reports such as seniority lists, subject area assignments, cross certification, and special system wide directories are readily produced. A negotiations subsystem allows for fixed rate or percentage increases for each step and level in the salary schedules. Employees attendance is posted to a calendar which appears on the screen. This allows for quick visual analysis of absentee patterns. Hard copy reports are also provided.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E and VAX/VMS

Developed By:
Systems Eleven, Inc.
P.O. Box 105
Southbury, Connecticut 06488

Availability:
Contact developer directly at the above address or telephone: (203) 264-3286.
Application: Financial/Facilities

SYSTEMS ELEVEN—PPBS

Description:
PPBS provides the central office administrator with a complete fiscal management tool. Financial record keeping functions are processed online resulting in immediate updating of files. The use of historical data contained within the current files provides the user with a valuable tool projecting future budget needs. The package encompasses a receivable system, a payables system, and a general ledger system. Budget files, vendor files, purchase orders, and expenditure files allow for complete processing. A comprehensive set of reports are available including federal and state requirements and standard budgetary reports. It provides the user with the capability of implementing Handbook II guidelines and meeting state-man dated line item reporting requirements.

Standard reports include:

Budget Object Summary
Budget Function Summary
Budget Location Summary
P.O. History Report
Open P.O. History Report
Open P.O. Report by Location
Expenditure Ledger
Non-standard Expenditure Ledger
Expenditure Ledger by Line Item
Cumulative Expenditure Ledger
Vendor Table List
Vendor Activity Report
By Object—ED001
By Function—ED001
’Check Register
Payable Checks

Language:
BASIC-PLUS and BASIC-PLUS-2

Operating System:
RSTS/E and VAX/VMS
Developed By:
Systems Eleven, Inc.
P.O. Box 105
Southbury, Connecticut 06488
(203) 264-3286

Availability:
Contact developer directly.
CAREER INFORMATION SYSTEM

Description:
The Career Information System (CIS) is the delivery vehicle for current, locally relevant occupational and educational information. CIS is designed for maximum user control, and is widely used by students, teachers, and counselors in junior and senior high schools and community colleges, as well as vocational rehabilitation, correctional, and other adult social service agencies.

It includes an effective career search questionnaire; information on occupational duties, requirements, employment, and outlook; methods of preparation; and local career exploration activities such as people to visit. Educational information includes an inventory of vocational and college programs, and the costs, services, and financial aid of schools.

File maintenance utility programs and technical assistance are available to facilitate state or metropolitan area adaptation of existing file content and addition of local information.

Minimum Education Level:
Grade 7 — Adult

Language:
PDP-11 Assembler for RSTS/E, FORTRAN IV

Operating System:
RSTS/E

Developed By:
Career Information System
247 Hendricks Hall
University of Oregon
Eugene, Oregon 97403

Availability:
At cost to agencies or consortia who can support local information maintenance and counselor training as well as computer software.

For More Information:
Contact Mike Neill, Acting Director of User Services.
Application: Guidance

GIS: GUIDANCE INFORMATION SYSTEM

Description:
GIS provides comprehensive career information in the following areas: occupations, 2- and 4-year colleges, financial aid, and graduate schools. In addition, GIS cross-references various multimedia materials for further information. Included in the annual license fee are bi-annual updates as well as in-service training.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Time Share Corporation
Educational Division
630 Oakwood Ave.
West Hartford, Connecticut 06110
(203) 522-0136

Availability:
Price varies depending on number of users. For more information, contact developer directly.
SIGI: INTERACTIVE GUIDANCE AND INFORMATION SYSTEM

Description:
SIGI is an interactive guidance system designed to aid students in (or about to enter) college in making informed career decisions. It emphasizes not only the decisions themselves, but also the process of decision-making. SIGI is composed of six subsystems: Values, Locate, Compare, Prediction, Planning, Strategy.

1. Values. The student examines 10 occupational values, such as helping others, income, independence, and security, and weights the importance of each one. The student then plays a values "game" to test the validity of his assigned weights and to help redefine his value structure.

2. Locate. The student puts in specifications and gets lists of occupations that meet specifications.

3. Compare. The student asks pointed questions and gets specific information about occupations of interest.

4. Prediction. The student finds out probabilities of getting various marks in key courses of preparatory programs for occupations.

5. Planning. The student gets displays of programs for entering occupation, licensing or certification requirements, and sources of financial aid.

6. Strategy. The student evaluates occupations in terms of the rewards they offer and the risks of trying to enter them.

Minimum Education Level:
Grade 11 and above

Language:
BASIC-PLUS, FORTRAN, BASIC-PLUS-2

Operating System:
RSTS/E, VAX/VMS

Developed By:
Educational Testing Service (ETS)
Princeton, New Jersey 08940

Availability:
SIGI may be leased under license from ETS. Current (1981) basic license fee of $2400 a year includes annual update and all necessary manuals and handbooks.
For More Information:
Contact ETS directly.

By mail:
Educational Testing Service
Princeton, New Jersey 08541
(609) 734-5165

ETS will be able to supply a kit of information and arrange for more
detailed discussion and demonstrations.
CATCAR: CATALOG CARD PRINTER

Description:
Part One of this program creates sequential file of titles, which Part Two will print into catalog cards on perforated 1-up stock. CATCAR uses operator supplied input (often available now with CIP). Eighteen lines of copy may be divided into description, subject headings, and/or tracings. The combined number of subject headings and tracings, however, may not exceed six. The system will handle main entry by author or by title, will accept alternate titles and series entries, and will automatically generate a Card Two if necessary. When finished, the card stock need only be separated and filed. Any special collection heading may be placed over the call number. In addition, the sequential file created by Part One may be used as a machine-readable catalog and accessed by SEARCH (see description in this catalog). Interested users will be kept informed of new developments in this system.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Larry W. Yother
Hartford State Technical College
401 Flatbush Avenue
Hartford, Connecticut 06106

Availability:
Contact developer directly at above address or telephone:
(203) 527-4111
Application: Library

SEARCH: SEQUENTIAL FILE ACCESS PROGRAM

Description:
SEARCH is a query selection program which works in conjunction with the sequential file of titles created by Part One of CATCAR (Catalog Card Printer listed in Library Applications). Part One of SEARCH will go through looking for user inquiries. It will pick out specified authors, titles, call number groups, subject headings or tracings. The user may specify as many letters as desired: author key S, for example, will produce all main entries beginning with S; author Sm, those beginning with Sm, and so on. The output may be sent to the terminal screen or to separate output files which are sorted and printed in columns by other programs. Interested users will be kept informed of new developments in this system.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Larry W. Yother
Hartford State Technical College
401 Flatbush Avenue
Hartford, Connecticut 06106

Availability:
Contact developer directly at above address or telephone: (203) 527-4111.
ULISYS (LIBRARY CIRCULATION SYSTEM)

Description:
A true online bibliographic system for library circulation control, suitable for municipal, institutional or academic libraries. It will accommodate any logical number of branches, locations, and terminals.

Terminals are made up of a scanning wand and a CRT. Books and user ID cards are identified by bar-coded labels. The system can also be commissioned for use with other types of check-out equipment.

Direct access is provided to all relevant files. Terminals display a response to each transaction and will guide the operator on to the next step where required. Notices and reports are printed periodically as defined.

The system consists of a basic set of programs which perform all standard circulation control tasks, including a very effective hold/recall procedure and collection usage analyses. Customizing is supplied to include local requirements. The system is currently installed and operating in four public libraries and one special library.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
The University of Winnipeg and Universal Library Systems Ltd.

Availability:
Universal Library Systems Ltd.
60 St. Clair Ave. East,
Suite 202
Toronto, Ontario M4T 1N5 Canada
(416) 961-1011

and

807-100 South Park Royal
West Vancouver, British Columbia
Canada V7T 1A2
APPLIED EDUCATIONAL SYSTEMS DAILY ATTENDANCE ACCOUNTING PACKAGE

Description:
The AES Daily Attendance Accounting Package produces daily absentee lists the start of each school day and compiles a variety of cumulative attendance reports whose scope has been too time-consuming for office personnel.

To produce the daily attendance list, homeroom or first period teachers submit to the office a mark sense card for each absent or tardy student. These cards are fed into the computer, and the attendance report, alphabetized for each grade (and also listed by sex if required), is generated. At the end of the day, after necessary changes are made (for tardiness or dismissal, etc.), the computer stores all data, and the mark sense cards are returned to homeroom teachers.

The following cumulative attendance reports are available at any time:

- The attendance record for an individual student within any given period of time.
- A list of students in each grade or in the entire school who have missed a specified number of days within a given time period.
- For any given time period the total days absent, tardy, or dismissed for all students in any grade or in the entire school.
- For each homeroom a daily list of students absent, tardy, or dismissed within that homeroom.
- For each student who has missed a specified number of days of school the computer will print out parent’s name and address on self-sticking, mailing labels.
- A list of students with perfect attendance.

In combination with the AES Grade Reporting Package the Daily Attendance Accounting Package will automatically transfer attendance data onto student report cards.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E
Developed By:
Applied Educational Systems
RFD 2, Box 213
Dunbarton, New Hampshire 03301

Availability:
Contact Robert C. Hamilton at Applied Educational Systems at above address or telephone: (603) 774-6151.
APPLIED EDUCATIONAL SYSTEMS GRADE REPORTING

PACKAGE

Description:
The AES Grade Reporting Package runs report card processing in the school and provides a turn around time of hours rather than weeks. The system is menu driven and can be operated by a person with no previous computer experience.

Information to the databases (i.e., student name, address, parent name, courses, teacher names, etc.) is entered online using guidance worksheets provided by AES. Grades are entered using mark sense cards filled out by teachers. Attendance information is entered online or is automatically provided by the AES Attendance Package. The computer processes all data and then automatically prints report cards that include student’s name; parent’s name and address; homeroom number; school-wide message; teacher and course names; numerical or letter grades; up to 99 variable comments per course; cumulative credit hours toward graduation; and attendance data including days tardy, absent, or dismissed. At the end of the year a summary of each report card is produced on permanent record labels.

The following reports are also available to the school at any time:

Student List by School or Year of Graduation
Town Residency List
Teacher List
Course Catalog
Report Card Comment List
Honor Rolls for Each Class
Rank in Class Listings
Alphabetized Cumulative Grade Point Average Listing
Student Failure and Incomplete List
Frequency Distribution of Grades by Teacher, Course, and YOG
Frequency Distribution of Grades by Departments
Summary Attendance List
Self-sticking, Permanent Record Labels
Mailing Labels

Minimum Education Level:
All
Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Applied Educational Systems
RFD 2, Box 213
Dunbarton, New Hampshire 03301

Availability:
Contact Robert C. Hamilton at Applied Educational Systems at above address or telephone: (603) 774-6151.
APPLIED EDUCATIONAL SYSTEMS SCHEDULING PACKAGE

Description:
With the AES Scheduling Package students fill out pre-registration forms which teachers and parents then review. Students indicate their final course selection using mark sense cards, which are processed by the computer. A list of those cards requiring corrections is provided, and when these corrections have been made, the cards are again fed into the computer. The following reports, which form the master schedule, are automatically produced:

Course Catalogue
Teacher Catalogue
Student Failure to Pre-register List
Student Error list
Under enrolled Class List and Students in Those Classes
Simple Tally of Courses by Grade, Department, and Sex
Student Course Request Catalogue
Student Verification Sheets
Homeroom Lists
Study Hall Lists
Course Conflict Matrix
Course Schedule for Each Student
List of Courses and Students Requesting Each Course

The scheduling package is menu driven and can be operated by a person with no previous computer experience. The most time consuming inputs are handled with mark sense cards, so there is little operator assistance required.

The AES Scheduling Package includes reports on student registration errors, allowing many potential conflicts to be resolved before a master schedule is produced. In addition, the final master schedule is produced using actual student course requests. Conflicts are thus reduced, students are more likely to be enrolled in the classes of their choice, faculty availability is used efficiently, and guidance personnel spend less time resolving scheduling conflicts.

Minimum Education Level:
All

Language:
BASIC-PLUS
Operating System:
RSTS/E

Developed By:
Applied Educational Systems
RFD 2, Box 213
Dunbarton, New Hampshire 03301

Availability:
Contact Robert C. Hamilton at Applied Educational Systems at above address or telephone: (603) 774-6151
APPLIED EDUCATIONAL SYSTEMS TEST SCORING PACKAGE

Description:
The AES Testing Scoring Package processes school-wide or district-wide multiple choice examinations such as those now required for Minimum Competency Determination. It also enables teachers to correct tests for individual classes. For both applications the AES package provides fast turnaround, allowing quick evaluation of student competence.

Students indicate their answers to multiple choice questions on mark sense cards. These cards are fed into the computer preceded by one card with only correct answers. The computer checks the validity of each question, then prints a separate page for each student, indicating for each question whether that student's answer was right or wrong. A separate teacher's report with student names alphabetized and the number of correct answers for each student is also generated.

The capability for cumulative storage of test data is available.

Like other AES software, this system is menu driven and can be operated without previous computer experience.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Applied Educational Systems
RFD 2, Box 213
Dunbarton, New Hampshire 03301

Availability:
Contact Robert C. Hamilton at Applied Educational Systems at above address or telephone: (603) 774-6151.
Application: Student Records

DELTA EDUCATIONAL COMPUTING SYSTEMS (TEACHER ASSISTANCE PROGRAMS)

Description:
Programs included are:

AVERG1  Averages and curves grades.
GRADE    Given the number of questions on a test, prints list of percent score vs. number of questions right or wrong.
STAT     Performs statistical analysis of student grades.
SCORES   Computes mean, standard deviation and standard scores for student grades.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
University of Delaware
College of Education
Newark, DE 19711
(302) 738-2160

Availability:
Contact developer at the above address.
EDUCATIONAL ADMINISTRATION SYSTEM (VERSION 2)

Description:
A secondary school administrative package consisting of the following four packages:
- Attendance
- Scheduling
- Grade reporting
- Student database

Packages can be used independently; however, they are most effective when used in conjunction with one another.

The attendance, scheduling, and grade reporting modules are designed to be used as subsystems of the student data system.

Attendance: This subsystem consists of an online terminal entry module which procedures daily, monthly, and term files and reports. It is able dynamically to produce machine formatted monthly reports for any calendar month period on demand.

Scheduling: This module handles both the traditional computerized scheduling and “arena scheduling.” It does not generate a master schedule, although some of the reports provide information to aid in the design of the master schedule. The following restrictions apply:
- 500 course titles
- 1000 course sections
- 99 sections of study hall
- 100 room designations
- 4 scheduling periods per year
- 30 course selections per student per year

Grade Reporting: This module handles both letters and numeric grade reporting. It allows for letter or numeric grade inputs.

The user may request that mid-term of final exams be averaged with term marks to produce semester or year-end averages.

The system is normally designed around a maximum of four reporting periods.

Student Database: This module coordinates all student information, including data from the attendance, grade reporting, and scheduling subsystems. This system integrates all student information, on both an individual and a collective basis, to allow the entry and retrieval of data in an efficient and coordinated manner.
Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Wachusett Regional School District
1401 Main Street
Holden, Massachusetts 01520
(617) 829-6771 X34
Application: Student Records

GRADES II

Description:
This is a class record keeping program which allows you to maintain class rosters (up to thirty (30) students on each roster), a listing of all grades for one marking period, and obtain student averages at any time in a marking period. There are a number of options available to you in this program. The program can work with class data which was entered earlier, you may open a file for a new class, or you can zero a file for another marking period. The last option would be used at the end of a marking period after you have printed grades for all your students. These grades will remain in memory to be used to calculate semester averages and final grades.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E, Version 7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
University of Delaware
College of Education
Newark, Delaware 19711

Availability:
Contact developer directly at the above address or telephone: (302) 738-2160.
Application: Student Records

HUNTINGTON 1 APPLICATION PROGRAMS—TEACHER ASSISTANCE

Description:
Eight BASIC programs designed to assist instructors in routine grading calculations.

AVERG1  Averages any number of grades. After instructor inputs the passing grade, the program lists numerical value of curve and the respective adjusted grades.

AVERG2  Sorts and averages from three to 10 grades, for a maximum of 35 students.

FREQ  Prints a frequency distribution of grades for a single test for one or more classes, or for several tests for one student.

GRADE  Prints a table of grades (in percentages), number of questions missed, and number of questions answered correctly.

ITEM1  Counts and prints number of times questions are missed on a test for a maximum of 200 questions.

ITEM2  Summarizes item analysis for up to five classes.

STAT  Treats class sets of laboratory data statistically, producing a table of experimental values with errors and percent error through bar graphs, ranking by percent error, ranking by experimental value, mean deviation, and standard deviation. Allows for realistic scale for marking purposes.

STATAL  Finds the mean, median, and standard deviation for a set of numbers.

Minimum Education Level:
All

Language:
BASIC

Operating Systems:
RSTS/E
Documentation:
Huntington I Application Programs — Teacher Assistance.

Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

Availability:
Contact the developer at the above address.
QEI ATTENDANCE REPORTING SYSTEM

Description:
QEI Attendance Reporting System provides for both daily and monthly attendance reporting. The Daily Attendance Report is an “exception” report listing only the absent students and their telephone numbers, should the school administration wish to call a student’s parent or guardian. This report is updated later in the day with the appropriate changes to the student’s status, and a new report is generated.

The Monthly Attendance Report lists the daily attendance status, monthly attendance summary with days in session and percent present for the month, entry or withdrawal code, and year-to-date attendance totals with days in session and percent present for the year for each student. The Monthly Attendance Report also prints the daily and monthly attendance totals showing average daily membership, average daily attendance, and percent present for each year of graduation. The Yearly Attendance Summary Report shows monthly and year-to-date attendance totals with averages and percent present for the whole school.

Input may be either through a terminal device or by prepunched mark-sense cards. Attendance may be either by the five-week period or by the calendar month. A maintenance program is provided to correct attendance information at any time. Maintenance may also be online or via the card reader. The monthly report is generated automatically from the last corrected daily attendance input.

Attendance categories include:
- Present
- Absent
- Tardy
- Dismissed
- Absent Tardy
- Absent Dismissed
- Tardy Dismissed
- Non-Member
- Entered
- Withdrawn
- Other or Suspended
Minimum Education Level:
Elementary and Secondary

Languages:
BASIC or BASIC-PLUS

Operating Systems:
RSTS/E

Developed By:
QEI, Incorporated

Availability:
Contact developer directly:
C.R. Burgess, President
Kim MacAlpine, Marketing Rep
QEI, Incorporated
119 Great Road
Bedford, Massachusetts 01730
(617) 275-6800

All programs are tailored to the specifications of each school. Price includes one school year of educational support.
QE AUTOMATED STUDENT SCHEDULING SYSTEM

Description:
The QE AUTOMATED STUDENT SCHEDULING SYSTEM is an online interactive student scheduler. Course and teacher catalog and student requests are entered into the computer through a terminal device or a card reader using prepunched mark-sense cards. The simple tally, conflict matrix, and various listings are produced as many times as desired. Maintenance programs allow for individual and group changes. The QE AUTOMATED STUDENT SCHEDULING SYSTEM assists the school in building a master schedule. Beginning with singletons, the Master Schedule Builder automatically groups courses by period so that the least number of conflicts will arise. The school chooses the desired period (not necessarily the period chosen by the computer) and locks the course in place. Using the computer, the school then “builds” the next course, groups of courses, or all remaining singletons around the first course, continuing until all singletons are added. The doubletons are added to the fixed base of singletons and the process is repeated. This continues until all of the courses have been added and assigned periods. A Potential Conflict Report shows student, teacher, and room conflicts by period for each course, and may be run at any time. Because of the flexibility of the Master Schedule Builder, the school can experiment with singletons, partial and trial student scheduling, and other scheduling techniques.

The school may add various coded parameters to the master schedule, such as alternates, linked courses, an Exclusive Semester Key, various priorities, and optimum and maximum seating.

Once the master schedule is built, students are added in a scheduling run. The computer automatically calculates a scheduling weight for each student based on the year of graduation, the total of the course scheduling weights, and the difficulty of the selected schedule. The computer schedules a student’s courses based on an automatically assigned course scheduling weight unless a priority code (an override mechanism) tells the computer that a particular course should be scheduled first. In this manner, required courses may be scheduled first for each student.

A maintenance program allows for changes to the master schedule. Once the final scheduling run is accepted, any changes made to a student’s schedule are automatically added to class rosters, and master schedule listings and a new student schedule may be printed.
Multiple reports are available after scheduling, such as pupil schedules, teacher and room schedules, teacher and room availability, student conflicts, courses in conflict, pupil availability, study hall lists, and class rosters.

The QEI Scheduling System is flexible and allows for various types of scheduling, including vocational technical school scheduling. The program is tailored where necessary to meet the specific requirements of each school.

**Minimum Education Level:**
Junior High, High School, Vocational Technical, University

**Language:**
BASIC-PLUS

**Operating System:**
RSTS/E

**Developed By:**
QEI, Incorporated

**Availability:**
Contact developer directly:
C.R. Burgess, President
Kim MacAlpine, Marketing Rep
QEI, Incorporated
119 Great Road
Bedford, Massachusetts 01730
(617) 275-6800

All programs are tailored to the specifications of each school. Price includes one school year of educational support.
Application: Student Records

QEI GRADE REPORTING SYSTEM

Description:
For grade reporting, teachers utilize either prepunched student grade sheets or coded, prepunched mark-sense cards. Grades may be either alphabetic, numeric, or a combination of both. Grades are entered into the computer either by card reader or keyboard terminal.

When all grades are entered, the computer prints student report cards with grades, course and credit information, teacher name, comments for each course, attendance information (including days suspended), mailing address, school-wide messages, and cumulative demerits, if desired. Class lists with current and previous grades are printed along with selected grade lists, including complete summary lists. The following reports are also generated: grade distribution by course, by teacher, by department, and by school; comment usage report; rank in class alphabetically and numerically; and permanent record labels. The computer automatically updates student records for career grade point average and rank in class. Grade point average may be either unweighted or weighted with up to four weights.

A maintenance program allows for changes and updates by card reader or through the keyboard terminal. A new report card for any student can be obtained at any time.

All programs are tailored to suit the specific requirements of each school. No special forms are required; report formats are flexible.

Minimum Education Level:
Elementary and Secondary

Languages:
BASIC or BASIC-PLUS

Operating Systems:
RSTS/E

Developed By:
QEI, Incorporated

Availability:
Contact developer directly:
C.R. Burgess, President
Kim MacAlpine, Marketing Rep
QEI, Incorporated
119 Great Road
Bedford, Massachusetts 01730
(617) 275-6800

All programs are tailored to the specifications of each school. Price includes one school year of educational support.
Application: Student Records

QEI STUDENT RECORD INFORMATION SYSTEM/MASTER FILE

Description:
The Student Information System maintains the personal history, attendance and previous grading information for each student. This system is the database for both the QEI Attendance and Grade Reporting Systems. The Scheduling System may be linked to the Student Information System if the school department chooses to do so. Each school may specify exactly what information it wishes to maintain on the students. The Record Information System also includes mailing labels, an age in grade report, and maintenance programs for ease in updating, adding, and deleting student records. Various reports may be obtained, so that in addition to listings by school and by year of graduation, other listings (such as by street or by bus number) are also generated.

Student records may include the following items:

- Student Number containing the Year of Graduation
- Student Name
- Student Address
- Home and Emergency Phone Numbers
- Bus Number
- Date of Birth
- Place of Birth
- Sex
- Entry Date and Entry Code
- Withdrawal Date and Withdrawal Code
- Previous Credits
- Rank in Class
- Grade Point Average
- 766 Information
- Parent Name
- Parent Address
- Attendance Data Year-to-Date Totals

Above items may change from school to school.

Minimum Education Level:
Elementary and Secondary
Languages:
BASIC or BASIC-PLUS

Operating Systems:
RSTS/E

Developed By:
QEI, Incorporated

Availability:
Contact developer directly:
C.R. Burgess, President
Kim MacAlpine, Marketing Rep
QEI, Incorporated
119 Great Road
Bedford, Massachusetts 01730
(617) 275-6800

All programs are tailored to the specifications of each school. Price includes one school year of educational support.
SCHOOL STUDENT ACCOUNTING PACKAGE

Description:
This is a package of over 100 programs to do student accounting of all types for a given school. Some of the subsystems are: a preregistration procedure, a registration procedure, a daily attendance procedure by class, and a grade reporting procedure. The registration procedure has both an online arena-type scheduling where terminals are in the arena, and an automatic scheduler. The entire package can be run from a remote terminal located in a school's office. There are many reports that can be pulled to aid in administration. Some of the reports are: student schedules, student body list by grade or alphabetically, class lists, class loads, teacher schedules, room schedules, address gummed labels, course offerings, master class schedule, conflict matrices, enrollment report, daily attendance report, weekly ADA report, failure list, incomplete lists, GPA listings, etc. Gummed tabs are printed at the end of the year for permanent record folders. The entire system is menu-driven and has an auto-queue feature. It also contains a cost accounting system.

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho
(208) 522-7490

Availability:
Contact developer directly.
SEATTLE PACIFIC REGISTRATION SYSTEM

Description:
The Registration System is based around the RSTS/E operating system using the RAP database management system. Registration is done through the use of interactive terminals.

Once a student identification number is entered into the system, the student's file is located and they are tentatively entered into various courses according to their registration form. Their schedule is checked for incorrect credits, credit overloads, class limits, room capacities, and such. The student schedule is then printed out on the terminal to allow for visual verification of accuracy. The student statistical information may or may not be entered during the session.

Upon acceptance of the schedule, the system then officially enrolls the student in each course, updates the student records, calculates the tuition charges, updates the schedule and proceeds to the next student. An optional invoice can be printed at a remote terminal (at the business office, for example). The invoice, if printed, will carry the course schedule as well as additional notices to the student.

Various statistical data and course enrollment lists are generated from the registration files. At the end of the term, grades are entered into the file, and grade reports are listed and transcript labels produced.

This system was designed to provide statistical data to comply with most forms encountered by the registration office. In addition, the system was designed to take a minimum of disk space.

The file system used allows easy expansion of nearly any parameters of the program, and is readily tailored to fit most college or university registration needs.

Disk Requirements
256 bytes/record in the quarter file
64 bytes/record in the course registered file
85 bytes/record in the student file
128 bytes/record in the course file

Minimum Education Level:
College and University

Language:
BASIC-PLUS
Operating System:
RSTS/E

Developed By:
Seattle Pacific University
Computer Services
3307 Third Avenue W
Seattle, Washington 98119

Availability:
Contact developer directly.
SOLVE: SOUTHEASTERN ONLINE VERSION OF ENROLLMENT

Description:
SOLVE is an online enrollment and student accounting program for colleges. Some of its features include: online reservation-type enrollment from multiple terminals, online access and modification capability for student records, and the printing of needed reports such as enrollment tallies, class rolls, student lists, report cards, grade labels, and honor rolls. SOLVE can be tailored to any size college enrollment.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Robert A. Branton, Jr.
Southeastern Oklahoma State University
Durant, Oklahoma

Availability:
DECUS (to members only)
Order #RSTS11-68
Application: Student Records

SYSTEMS ELEVEN — ATTENDANCE
The Attendance package is created from the Scheduling File which is listed in Student Records and interfaces with the Registration File, which is also listed in Student Records. It records period by period absences, tardies, and dismissals in user defined categories Daily attendance lists show the student’s name, the periods absent, the initials of the teacher recording the absences, the total number of days absent for each period. Total absences, total consecutive absences, and half-day absences are calculated and reported. A counselor’s report lists all classes missed for every student assigned to the counselor. A summary list for each teacher shows names and dates of absences for each period taught by the teacher. Monthly and year end summaries print total dates, and day of week absences for every student in every period. Input is from cards or screen. The cumulative figures are automatically updated as information is entered. Inquiries by day display the student’s schedule and indicate whether the student was tardy, suspended, absent, etc..after each period. Utilities exist to do file maintenance and updating.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS, VAX-11 BASIC

Operating System:
RSTS/E and VAX/VMS

Developed By:
Systems Eleven, Inc.
P.O. Box 105
Southbury, Connecticut 06488

Availability:
Contact developer directly at the above address or telephone: (203) 264-3286.
SYSTEMS ELEVEN—GRADE REPORTING

Description:
The report card database is created from the scheduling file. Utilities exist for changing or deleting existing records and adding new records to the file. Grades may be entered via a terminal device, mark sense cards, or optical scanning sheets. Grades may be alpha + or −, numeric, or a combination of the two. Report cards include a school-wide message, worded comments, and daily attendance for each class. Grade analysis; D, F, and I reports; honor rolls; grade point averages; and rank in class are calculated. Permanent record labels and mailing labels are produced at the end of the year.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS and BASIC-PLUS-2

Operating System:
RSTS/E and VAX/VMS

Developed By:
Systems Eleven, Inc.
P. O. Box 105
Southbury, Connecticut 06483
(203) 264-3286

Availability:
Contact developer directly.
SYSTEMS ELEVEN—REGISTRATION

Description:
REG is a complete child accounting system containing all pertinent information required for state and federal reporting. User-defined fields allow for storing information unique to a school system. Master registration lists by system, school, grade, etc. are readily available. This system has been designed around guidelines provided by the U.S. Department of Education, state guidelines, and individual school needs. Information is stored and readily retrievable in the following categories.

- Personal Identification
- Family and Residence
- Physical, Health, Sensory, and Related Conditions
- Mental, Psychological, and Proficiency Test Results and Related Student Characteristics
- Enrollment
- Performance
- Transportation
- Special Assistance and Tuition

Minimum Educational Level:
All

Language:
BASIC-PLUS and BASIC-PLUS-2

Operating System:
RSTS/E and VAX/VMS

Developed By:
Systems Eleven, Inc.
P.O. Box 105
Southbury, Connecticut 06483
(203) 264-3286

Availability:
Contact developer directly.
Application: Student Records

SYSTEMS ELEVEN—SCHEDULING

Description:
An online interactive system designed to step the user chronologically through the entire scheduling process from student requests to building the master schedule to printing student schedules. The system, developed for ease of use and flexibility, features:

- Online master schedule building
- Computer scheduling of individual students
- Online schedule changes
- Generation of daily add/drop lists
- Immediate generation of updated student schedules
- Multi-time vector classes
- Variable class balancing facilities
- Online class conflict screen
- Alternate course scheduling
- Course and student priority scheduling
- Linked or Blocked courses
- Study hall subsystem

Standard Reports Include:

Course Catalog            Student Schedules
Teacher Catalog           Teacher Schedules
Student Verification      Student Conflicts
Simple Tally              Class Lists
Pre-Assignment Class Lists Homeroom Lists
Conflict Matrix           Unassigned Counters
Harmony Lists             Study Hall Lists
Master Schedule Listing   Seat Availability Lists
Teacher Utilization       Room Utilization
Minimum Education Level:
Secondary

Language:
BASIC-PLUS and BASIC-PLUS-2

Operating System:
RSTS/E and VAX/VMS

Developed By:
Systems Eleven, Inc.
P.O. Box 105
Southbury, Connecticut 06488
(203) 264-3286

Availability:
Contact developer directly.
BENTLEY COLLEGE ACCOUNTING PACKAGE

Description:
A set of 12 accounting programs designed to illustrate college accounting texts and perform useful accounting calculations. Texts used are: Intermediate Accounting by Simons; Cost Accounting by Matz/Curry; and Accounting with the Computer by Wilkenson.

Programs include bond amortization, bond yield calculations, mathematical valuation of bonds, six methods of depreciation, overhead standard variances, material and labor variances, pension fund analysis, lease-purchase method of leaseholds, and an accounting simulation for student interaction. Several other programs are available to find the roots of a function over an interval, and the maximum value of a function over an interval.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Bentley College
Waltham, Massachusetts

Availability:
DECUS (to members only)
Order #RSTS11-7
Application: Business

BENTLEY VARIETY PACKAGE

Description:
This package contains a variety of routines. Programs are included in the areas of Accounting, Games, Government, Business Management (including two critical path routines), Mathematics, Physics, Science, Statistics, and Utilities.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Ross Kass, Darryl Johnson, et al.
Bentley College
Waltham, Massachusetts

Availability:
DECUS (to members only)
Order #RSTS11-62
CASTLE: COMPUTER ACCOUNTING LAB ENVIRONMENT

Description:
This package of 11 BASIC-PLUS programs plus Chart-of-Accounts data file provides the accounting instructor with a lab environment for students. Users of this interactive system are able to perform the types of accounting functions common to most introductory accounting courses.

Activities performed by students in the lab include:
1. Analyzing the problem and organizing the data.
2. Entering data via computer terminal.
3. Calling for the appropriate accounting function.
4. Printing output files on terminal or lineprinter.
5. Analyzing the results, correcting errors, etc.

Accounting functions performed by the computer include:

Entry of data  
Journals (transaction, adjusting, closing entries)  
Ledgers  
Balance Sheets  
Trial Balances (including post-closing)  
Income Statements  
Worksheets  
Bank Reconciliations  
Payroll Registers  
Depreciation of Fixed Assets

The programs are designed to be used with the accounting textbook Computer Oriented Accounting by Pillsbury (Southwestern Publishing Company), but instructors can also invent their own exercises. Students need not have prior computer experience, but must have a working knowledge of the relevant accounting principles.

Documentation included with the CASTLE package consists of a User's Guide and a System Manager's Guide.

NOTE
A 132-column printer or terminal is required.

Minimum Education Level:
Secondary
Language:  
BASIC-PLUS

Operating System:  
RSTS/E

Developed By:  
Newton North High School  
Newtonville, Massachusetts

Availability:  
Contact developer directly at the following:

Paul Shapiro
Computer Coordinator
Newton North High School
360 Lowell Avenue
Newtonville, Massachusetts 02160
COMPUTER-ASSISTED INSTRUCTION IN ECONOMICS
(University of Notre Dame)

Description:
In the teaching of economics, the principal modes of instruction currently are lectures and/or discussion groups. The computer-based instruction application most readily adaptable to these modes is the interactive review routine.

The economics review routines developed at Notre Dame are tutorials programmed in a multiple-choice format. They currently are used in "Principles of Economics," an introductory course with a large enrollment. This course is a prerequisite for economics majors.

When using the economics tutorials, students call up tutorials relating to subject matter covered in classwork or outside reading. Each tutorial consists of approximately 10 questions. For each choice, there is a corresponding programmed response. These brief responses tell students why the answers they have selected are correct or incorrect. At the end of each tutorial session, the students are provided with a report of the number of first-choice correct answers.

Minimum Education Level:
College and University

Language:
BASIC

Operating System:
RSTS/E

Developed By:
University of Notre Dame
Notre Dame, Indiana

Availability
Contact developer directly:
Robert E. Burns
Associate Dean
College of Arts and Letters
University of Notre Dame
Notre Dame, Indiana 46556
DELTA EDUCATIONAL COMPUTING SYSTEMS — BUSINESS PROGRAMS #1

Description:
Programs include:

DECSN
Management Decision Simulation for 10 to 60 Participants. This program furnishes the simulated business conditions and mechanics for operating a business simulation with 10 to 60 participants. The participants form teams representing fictitious companies and make decisions on price, promotion, production, capacity, research, incentives, and training in a one-product market. The program provides a set of interrelated market and internal conditions that approximate real conditions, including some random perturbation.

MANAGE
SETUP
OUTPUT
Management Decision Simulation for Three Teams. This program allows three teams to act as business executives making periodic high-level decisions for their firms. A realistic business practice operating over a period of several years can be simulated in one day. Each team alternately makes decisions about their company and allows the computer to simulate interactions among the teams and produce quarterly reports based on the strategies of all three teams.

DEPCOM
Four Methods to Calculate Depreciation. This program computes and prints the monthly depreciation of a given investment by four methods: straight line, double declining balance, sum of the year's digits, and 150% declining balance, and provides an output for easy, direct comparison.

ANNUIT
Annuity Analysis. This program performs the calculations necessary for determining both payment and withdrawal annuities.

EQUITY
Cost of Equity Capital. This program computes the cost of equity capital by computing the dividends and the share price for future periods, and finds the discount rate by equating the present value of the stream to the current share price.
INSTMT

Income Statement. This program prints a simple income statement and allows a sensitivity check on various input.

LENDER

Simple Loan Analysis. This program calculates the monthly interest charges and outstanding balance of a loan that must be paid off in a one year period.

TRUINT

True Annual Interest Rate. This program calculates the true annual interest rate charged on an installment loan.

LESSEE

Lease Analysis. This program compares the advantages of leasing vs. purchasing equipment. Investment tax credit is considered and a sensitivity check is available, as is a cash flow diagram.

SALES

Sales Commission Report. Dependent upon a number of input conditions, this program will print a monthly planning table for a salesperson, including base salary, incentive dollars, and prospective billing totals.

MKB

Make vs. Buy Analysis. This program compares and makes a decision on whether it is advantageous to make or buy a product.

MORGAG

Mortgage Analysis. This program will find the missing parameter of the following four, given the remaining three: the rate charged on a mortgage, the life, amount borrowed, and the monthly payment. It also prints a summary, either monthly or yearly, indicating the amount of interest, payment on principal, and outstanding balance for each period.

GNPSUM

Gross National Product Summary. This program produces figures for GNP, consumption, investment, and government spending for a series of years from a model in which consumption is a function of income in the previous period, and investment depends in part on changes in consumption.

EXDRSK

Extended Risk Analysis. Dependent upon a number of estimates, the program performs an extended risk analysis, determining the advan-
tages or disadvantages involved in making certain financial investments. The output is in the form of the average cash flows per future period, the expected payback period, the expected rate of return, and the probability of various rates of return.

STKRTN

Stock Return Report. This program computes a matrix of returns for an investment in a stock. It then computes an average return for a purchase at the beginning of a year, selling at each of the following years end, and computes an average return for all possible holding periods. It then computes an average return, standard deviation, and coefficient of variance for different-length hold periods.

STKSMO

Exponential Smoothing Stock Guide. This program uses exponential smoothing on past price data to provide a guide for timing of orders on a given stock. The user has the option of indicating that the data he enters for a given stock are to be preserved for use at a later time. Data input should be the price of the given stock for any number of consecutive periods.

STKVAL

Stock Value Report. This program calculates stock value and advises on purchase or sale based on growth rate over a period of years. The program is limited to a 50-year life.

STKINC

Stock Merger Program. This program prints a composite corporate picture of two companies considering a merger. The program requests pieces of information on each company, including:

- price/earning ratio
- internal growth rate
- before-tax earnings
- expected growth rate after merger
- total number of shares outstanding after merger
- annual percentage increase in number of outstanding shares after merger
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNDPRC</td>
<td>Bond Price Analysis. This program computes the price and accrued interest for a bond, given its coupon, redemption price, yield, and maturity life.</td>
</tr>
<tr>
<td>BNDYLD</td>
<td>Bond Yield Analysis. This program computes after-tax yield to maturity of a bond, given its coupon, redemption price, maturity life, price, and the tax rates applied to interest and capital gains.</td>
</tr>
<tr>
<td>BNKRSV</td>
<td>Bank Reserve Calculations. This program calculates the required bank reserve, and the reserve position at the close of a given bank's business day.</td>
</tr>
<tr>
<td>CAPINV</td>
<td>Capital Investment Analysis. This program provides a listing of gross cash flow, annual depreciation, annual tax, net cash flow, and discounted cash flow for a long-term capital investment.</td>
</tr>
<tr>
<td>EXSMOO</td>
<td>Exponential Smoothing on Price Data. This program uses exponential smoothing to forecast data which is thought to have a trend and/or seasonal effect. Output is provided per period as a comparison between different methods of smoothing.</td>
</tr>
<tr>
<td>BALSHT</td>
<td>Balance Sheet and Income Statement. This program provides a listing of a simple pro forma income statement and balance sheet.</td>
</tr>
<tr>
<td>INACNT</td>
<td>National Income and Product Accounts. This program produces a set of income and product accounts depending upon input of gross national product conditions.</td>
</tr>
<tr>
<td>INOUT</td>
<td>Analysis of Interindustry Product Flow. This program analyzes the interindustry flow of goods and services over a period of time based on the data for some past period. The program can predict future flows under different consumer demand conditions.</td>
</tr>
<tr>
<td>BUDGET</td>
<td>Department Manager's Budgeting Program. This</td>
</tr>
</tbody>
</table>
program produces an itemized budget summary based on projected controllable expenses for a six month period.

The program requests the following projected controllable expenses:
- salaries
- travel expenses
- printing and reproduction
- meals and lodging
- operating supplies
- other expenses
- equipment costs
- advertising and promotion
- demo and loan costs

The program is primarily used to explore the effects of alternate budget plans. Information calculated includes:
- freight out
- total operating
- payroll taxes
- expense
- overhead charges
- total controllable
- depreciation
- expenses
- occupancy costs
- total location
- training sold
- expenses
- total for each
- total personnel
- expense item
- count

**DYNPRO**

Dynamic Programming Model. This program solves a general-purpose dynamic programming model whose solution is contained in the inlet state.
Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

Availability:
From DELTA
Application: Business

DELTA EDUCATIONAL COMPUTING SYSTEMS — BUSINESS PROGRAMS #2

Description:
Programs included are:

**GSSS**
Small system simulator, allows an item to be created, moved through a defined system, then destroyed.

**CSHFLO**
Performs up to four cash flow analyses for given cost of capital; computes rate of return and payback period.

**GNMRVB/GMRGB**
Securities portfolio analysis (I and II).

**GSTKVL**
Stock valuation.

**GTHOR**
Securities EPS growth.

**TRCK1**
Calculates lease income.

**LOAN**
Loan amortization.

**GIRRPV**
Investment return (cash flow).

**GRISKA**
Analysis of risk in capital investment.

**IATA1**
Calculates breakpoint weights for air freight.

**DROIPB**
Discounted return on investment.

**GKASSF**
Computes normal price of a warrant.

**GKCOST**
Price/earnings ratio calculations.

**GVOTE**
Simulates committee votes.

**CPATH**
Critical path analysis.

**GCPM1**
Critical path analysis.

**GCPATH**
Critical path analysis.

**SLSSMN**
Sales management program.

**INSTR.UCS**
Instructions data file for SLSSMN.

**LABOR**
Labor/management bargaining simulation.

**LABSET**
Creates data file for LABOR.
LABOR. Description of LABOR program.
DOC
MARKOW Computes efficient securities portfolios.
GNPSUM Produces figures for GNP, consumption, investment, and government spending from a model where consumption is a function of income in the previous period.
WHEELS Program simulates finances of owning and operating a car over 12 months.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

Availability:
DECUS (to members only)
Order #RSTS11-48
Application: Business

IDA™: INTERACTIVE DATA ANALYSIS AND FORECASTING

SYSTEM

Description:
IDA is a general-purpose conversational statistical package which was originally developed at the Graduate School of Business, University of Chicago. The package emphasizes the statistical tools most useful for forecasting and data analysis, particularly regression analysis and related model-building techniques, and Box-Jenkins estimation and forecasting methods. In addition, IDA offers comprehensive statistical capabilities including summary and one-sample statistics, probability calculations and simulations, and tabular analysis. The system has extensive data handling facilities including terminal and file entry, editing and transformation, and data display and plotting. IDA is virtually self-teaching. Elaborate error detection and recovery codes, internal help files and documentation, bi-level prompts, and other special features of IDA are all designed specifically for the user's convenience. The package is supplemented by a comprehensive User's Manual and program-keyed statistical texts which are suitable for classroom use or self-study.

Minimum Education Level:
College or University

Language
FORTRAN

Operating System:
VAX/VMS

Developed By:
The Graduate School of Business, University of Chicago and SPSS Inc.

Availability:
Penelope Bingham
SPSS Inc.
444 N. Michigan Ave., #3300
Chicago, Illinois 60611
(312) 329-2400
INV|S|IM: INVENTORY SIMULATION

Description:
INV|S|IM simulates inventory systems in a timesharing environment. Its options include heuristic rules for guiding the selection of decision variables, simulation of TZ, SQ, and SZ inventory policies, and the ability to find the sensitivity of costs and availability to unit costs, lead time, demands, randomness, and various decisions.

Minimum Education Level:
College and University

Language:
BASIC-PL|S|

Operating System:
RSTS-11

Developed By:
Eliezer Naddor
The Johns Hopkins University
Baltimore, Maryland

Availability:
DECUS (to members only)
Order #RSTS11-69
MANAGEMENT CASE STUDIES

Description:

Programs include simulations of seven companies. Instructions on program operation are contained in the individual programs.

Minimum Education Level:
Junior and Community College

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Bentley College
Waltham, Massachusetts

Availability:
DECUS (to members only)
Order #RSTS11-40
Application: Business

SHELF/FLOOR SPACE ANALYSIS (MARKETING)

Description:
This program allows the marketing student or retailer to perform an item productivity analysis by product category for retail stores. By entering the following variables:
• the total number of brands in a product category to be studied
• the brand name
• the number of items under the brand name (if any)
• the item size in ounces
• the price
• the total units sold and space occupied, the following information will be printed:
  • Share of market by:
    • percentage of total ounces sold
    • percentage of gross retail sales
    • percentage of dollar volume
    • percentage of gross margin

In addition, a listing of gross sales by square feet and gross margin by square feet is also printed. Finally, a summary page by brand share utilizing the above output measures is also printed.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Developed On:
RSTS/E V6A

Developed By:
Therence Murphy
Plymouth State College
Plymouth, New Hampshire 03264

Availability:
DECUS (to members only)
Order #RSTS11-97
ABC’S OF CAI, 5TH EDITION

Description:
The ABC’s of CAI is a combination CAI reference handbook and instructional courseware catalog. It contains information about CAI centers to visit, relevant books, periodicals, organizations, places to acquire courseware and a calendar of CAI conferences. The Catalog of Instructional Courseware lists descriptions and information on approximately 130 CAI programs available on magtape to educational institutions or other nonprofit organizations. All programs have been evaluated and given high ratings by university faculty. They are written in a structured, simplified BASIC designed for maximum portability.

Available programs cover the following disciplines:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>No. of Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>6</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1</td>
</tr>
<tr>
<td>Biology</td>
<td>4</td>
</tr>
<tr>
<td>Business Statistics</td>
<td>18</td>
</tr>
<tr>
<td>Counseling</td>
<td>2</td>
</tr>
<tr>
<td>Chemistry</td>
<td>21</td>
</tr>
<tr>
<td>Ecology</td>
<td>1</td>
</tr>
<tr>
<td>Economics</td>
<td>2</td>
</tr>
<tr>
<td>Education</td>
<td>6</td>
</tr>
<tr>
<td>Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
</tr>
<tr>
<td>Geography</td>
<td>1</td>
</tr>
<tr>
<td>History</td>
<td>3</td>
</tr>
<tr>
<td>Home Economics</td>
<td>2</td>
</tr>
<tr>
<td>Management</td>
<td>8</td>
</tr>
<tr>
<td>Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>10</td>
</tr>
<tr>
<td>Operations Research</td>
<td>4</td>
</tr>
<tr>
<td>Physics</td>
<td>16</td>
</tr>
<tr>
<td>Political Science</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td>9</td>
</tr>
<tr>
<td>Sociology</td>
<td>7</td>
</tr>
</tbody>
</table>

Minimum Education Level:
Secondary and Higher Education
Language:
Simplified structured BASIC

Operating System:
RSTS/E

Developed By:
Center for Information Processing
California State University, Fresno

Availability:
Contact developer:
Dr. Jack A. Chambers
Center for Information Processing
California State University, Fresno
Fresno, California 93740
(209) 487-1123

Available in either 7- or 9- track, 800 or 1600 bpi, ASCII or EBCDIC.
Application: CAI/CMI/CAT

BASIC TUTOR PROGRAMS

Description:
Seventeen tutoring programs (TUTR01-TUTR17) presenting to the user the fundamentals of BASIC programming and simple operating procedures for RSTS. Programs are self-explanatory, directing the user to perform instructional and review exercises before proceeding to the next lesson. Programs are most effectively used with a hard copy terminal.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Dartmouth College. Adaptations by Digital Equipment Corporation for PDP-11 use.

Availability:
DECUS (to members only)
Order #RSTS11-22
BERTIE (INTRODUCTORY LOGIC)

Description:
Designed for use in an introductory logic course, BERTIE is a program which checks deductions in sentential logic and quantificational logic. Based on the set of rules found in Elementary Symbolic Logic by Gustason and Ulrich, BERTIE provides immediate feedback when it encounters deductive errors, ill-formed formulas, or incorrectly justified formulas, and assists the student in acquiring strategies and tactics needed to solve problems in natural deduction. Students may enter their own problems for BERTIE to check, or may use any of 50 prestocked problems carefully selected to illustrate various techniques of natural deduction. These are arranged in order of increasing difficulty. Since BERTIE can provide help and hints on these stored problems, students who work through this battery of problems should acquire insights into the strategies and tactics needed to solve even quite complicated problems.

A Manual for BERTIE (developed under the auspices of Project COMPUTE at Dartmouth College and published by COMPRESS, Inc.) introduces both student and instructor to the use of BERTIE, describing conventions for the program and the rules employed by the program for both sentential and quantificational logic.

Minimum Educational Level:
College

Language:
BASIC

Operating System:
Dartmouth College Time Sharing, designed for transportability; implemented on various equipment.

Developed By:
James Moor, Department of Philosophy, Dartmouth College
Jack Nelson, Department of Philosophy, Temple University

Availability:
COMPRESS, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
CAI PACKAGE

Description:
The CAI (Computer Assisted Instruction) Package allows a teacher to create a test on any subject and includes question branching, numerical approximation, and multiple choice features. The test administration program remembers each student and greets him or her with an appropriate message. Student numbers are required and a program is provided to create and maintain the student data file. Student lists and reports that include elapsed time as well as test scores, and copies of tests can be printed. A simple editor is provided to fix errors in tests. Also included is a set of vocabulary and comprehension CAI tests based on stories from the Reader's Digest Skill Builders Series and a program that can be used to maintain a catalog of such tests.

Programs provided include:
CREATE — Creates tests
TEST — Administers tests to the students
FIX — Allows teacher to edit tests
COPIES — Prints teacher or student copies of tests
ADDROP — Creates and maintains student number file
REMOVE — Removes unwanted tests from your account
REPORT — Prints report of student test results
LIST — Prints list of student names by number
CATALOG — Maintains catalog of reading tests

Minimum Education Level:
All

Language:
BASIC-PLUS

Developed On:
RSTS/E

Developed By:
John Cartan

Availability:
Contact John Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
CMI: COMPUTER-MANAGED INSTRUCTION
EXPLORE, REPORT, CREATE

Description:
This computer-managed instructional delivery system (CMI) manages and delivers individualized instructional modules through EXPLORE, CREATE, and REPORT programs. The individualized instructional modules are made up of the following parts: (1) a terminal performance objective (TPO), (2) a pre-check, (3) package(s) containing an enabling objective, instructional resource(s), learning activity(s), and feedback, (4) a post-check, (5) an alternate post-check(s), and (6) remedial feedback. The modules are delivered to the students via a DECwriter terminal (hardcopy).

The EXPLORE program delivers the instructional modules to the student.

The REPORT program is the instructor's gradebook. The program keeps current records of the students using the EXPLORE program.

The CREATE program is the computer-managed instruction system (CMI) manager's tool. It is used to take the instructional modules developed by instructors, teachers, and others and build them properly for the EXPLORE program.

CMI is an efficient and easy to use system for student, instructor, and system manager. Its format and operation make it possible to adapt almost all types of instruction for use on the system. Using TECO, a simple text editing program, teachers can enter their modules of instruction and then request the system to add them to the CMI database. In this way, a large and varied selection of modules can be made available in many subject areas.

The advantage of the CMI system for teachers is that it provides instruction to the students and frees the teacher to spend more time working with those students who may need special help or individual instruction.

Minimum Education Level:
All

Language:
BASIC-PLUS
Operating System:
RSTS/E

Developed By:
Dr. Edward E. Boas, Jr.
DELTA EDUCATIONAL COMPUTING SYSTEMS
University of Delaware
College of Education
Newark, DE 19711

Availability:
Contact Developer Directly at the above address or telephone: (302) 738-2160.
COMPRENDIUM OF DECAL CAI PROGRAMS

Description:
This compendium of 13 CAI programs written in DECAL covers lessons in vocabulary, the study of weather, metric conversion, algebra, fractions, multiplication, English studies, and basic accounting. Each CAI lesson was developed during a CAI Computer Development workshop on such topics as the development of behavioral objectives, orientation related to programming instruction, and coding lessons.

Minimum Education Level:
Elementary and Secondary

Language:
DECAL (prerequisite software)

Operating System:
RSTS/E

Developed By:
Staff Development Committee
Berea City School District
Berea, Ohio
Coordinator — Charles Mustain

Availability:
DECUS (to members only)
Order #RSTS11-94
Application: CAI/CMI/CAT

COMPUTE (COMPUTER GENERATED ARITHMETIC MATERIALS)

Description:
One of the most onerous, time-consuming and frustrating tasks that can befall a mathematics teacher is the job of producing diagnostic, achievement and review tests for the student—tests designed to meet the specific needs of the specific student which will show the levels and areas on which the teacher should concentrate. COMPUTE takes this test-making burden from the teacher's shoulders.

The COMPUTE program gives teachers and students the capability of generating computational skills tests and work sheets at terminals located in their schools. Programs for approximately 400 different types of computational problems in whole numbers, fractions, decimals, and percents are stored in the computer. The random number function in the computer is used to generate diagnostic tests of work sheets with the types of problems specified by the teacher.

The computer will also provide the answer on separate sheets. In this manner work sheets can be individualized to give the learner practice in the specific types of problems with which she/he has difficulty on the diagnostic tests.

In addition to the diagnostic tests, the computer will also generate short progress tests, longer achievement tests, and more comprehensive review tests. The teachers will be able to take the print-outs of the various tests and work sheets generated by the computer and administer them directly to the students. Or the teachers can produce multiple copies of individual tests and work sheets. This program will integrate the use of computer technology into the total learning process, providing teachers with an excellent tool for individualization at relatively modest cost. The teacher will easily be able to produce work sheets geared to the specific needs of individual students. Furthermore, the teacher will not have to worry about compromising tests on computational skills because a new form can easily be generated. In this manner students will be able to keep their tests and use them to help locate and remedy any computational deficiencies which are identified by the tests.

Minimum Education Level:
All

Language:
BASIC-PLUS
Operating System:
RSTS/E

Developed By:
Minnesota Educational Computing Consortium
(Actual work done by Minneapolis Schools and St. Paul Schools person
nel under a Council on Quality Education grant by the Minnesota State
Legislature). The Digital version of COMPUTÉ was made opera
tional by Walter Koetke of Lexington High School, Lexington, Massa-
chusetts.

Availability:
Contact:
Director
Instructional Services
2520 Broadway Drive
Lauderdale, Minnesota 55113

MECC sells the license to COMPUTE for $500. The RSTS/E version is available from:

William T. Spencer
Lexington High School
251 Waltham Street
Lexington, Massachusetts 02173

Arrangements for the license are made with MECC and arrangements for the Digital version are made with Mr. Spencer. Lexington Public Schools has a fee. Send blank magnetic tape or RK05 disk.

For More Information:
A COMPUTE teachers manual is available from MECC Support Ser-
vices, 2520 Broadway Drive, Lauderdale, Minnesota 55113.
COMPUTER-ASSISTED INSTRUCTION IN ENGLISH
(University of Notre Dame)

Description:
In the teaching of English grammar and composition, the principal modes of instruction currently are lectures and/or discussion groups. The computer-based instruction application most readily adaptable to these modes is the interactive review routine.

The English review routines developed at Notre Dame are tutorials programmed in a multiple-choice format. They currently are used in two English courses. The first course is designed to meet the needs of students for whom English is a second language. The second course is a one-semester composition and literature course required of all freshmen at Notre Dame.

When using the English tutorials, students interface with computer terminals after each class meeting. The 46 tutorials consist of 11 questions. For each choice, there is a corresponding programmed response.

At the end of each session, students carry away a print-out which provides a record for future study and evaluation. After reviewing their performance, students present the print-outs to their instructors to pinpoint the particular weaknesses of individual students and of entire classes. When a student's performance reflects serious difficulty, he or she is directed to repeat the tutorial.

Minimum Education Level:
College and University

Language:
BASIC

Operating System:
RSTS/E

Developed By:
University of Notre Dame
Notre Dame, Indiana

Availability:
Contact developer directly:
Robert E. Burns
Associate Dean
College of Arts and Letters
University of Notre Dame
Notre Dame, Indiana 46556
COMPUTER-ASSISTED INSTRUCTION IN HISTORY
(University of Notre Dame)

Description:
In the teaching of history, the principal modes of instruction currently are lectures and/or discussion groups. The computer-based instruction application most readily adaptable to these models is the interactive tutorial.

Such tutorials are review routines usually programmed in a multiple choice format. When using the tutorials developed at Notre Dame, students interface with computer terminals after each class meeting. Students call up a tutorial program based on information already consists of approximately 12 multiple-choice questions. For each choice, there is a corresponding programmed response. These responses vary in length from a few lines to several paragraphs telling students why the answers they have chosen are correct, partially correct, or wrong.

Notre Dame has on-line and operational a two-semester introductory-level course in Western Civilization and a one-semester introductory level course in Early American History.

The Western Civilization course consists of 52 tutorial programs which contain over 500 questions examining a variety of topics ranging in time from the collapse of the Roman Empire to the end of World War II. The questions present information fundamental to an introductory-level course and lend themselves to any college text and combination of supplementary readings.

The Early American History course consists of 20 programs which contain over 200 questions describing the history of pre-Columbian American Indian societies, colonial lifestyles, and the Atlantic slave trade.

Minimum Education Level:
College and University

Language:
BASIC

Operating System:
RSTS/E
Developed By:
University of Notre Dame
Notre Dame, Indiana

Availability:
Contact developer directly:
Robert E. Burns
Associate Dean
College of Arts and Letters
University of Notre Dame
Notre Dame, Indiana 46556
CONVERSATIONAL BASIC PROGRAMS

Description:
Information Storage and Retrieval — This package contains eight BASIC programs dealing with general storage and retrieval of information systems. All of these programs have identical command language and structure and chain to one another, as the need arises. They are particularly useful for instructional purposes.

Inventory Management — This package contains 12 different conversational BASIC programs dealing with applications in inventory control, inventory simulations, and inventory information. All of these programs have identical command language and structure. They are particularly useful for instructional purposes.

Management Science — This package contains 12 different conversational BASIC programs dealing with management science and operations research applications. All of these programs have identical command language and structure. They are particularly useful for instructional purposes.

Minimum Education Level:
Secondary School

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Dr. Eliezer Naddor
Dept. of Mathematical Sciences
The Johns Hopkins University
Baltimore, Maryland 21218

Availability:
Contact developer directly at the above address or telephone: (301) 338-7216
Application: CAI/CMI/CAT

DECAL: DIGITAL EQUIPMENT CAI AUTHOR LANGUAGE

Description:
DECAL, Digital Equipment CAI Author Language System, is the Computer Assisted Instruction (CAI) lesson authoring system. It is designed to enable teachers with no previous computer experience to provide individualized instructions for students. DECAL is suitable for use in any subject area and at all grade levels.

DECAL lessons can present textual material to a student, provide additional help at the student's request, anticipate and respond to both correct and incorrect responses, and dynamically determine sequence based upon those responses to individual lesson sections. Lessons can be up to 50 segments (questions) in length and can be linked with other lessons to form courses and share among schools. Students can leave a DECAL lesson at any point in the lesson, and later return to the lesson at the point where they left off. These features enable instructors to create effective lessons in the area of:

- drill and practice
- tutorials
- quizzes and tests
- dialog/inquiry sessions
- simulation and games
- problem solving

DECAL lessons are interactive and can provide HELP messages for all questions requiring a response from the instructor or student. The DECAL system includes provisions for administering, creating, and editing lessons; gathering and reporting lessons and individual student comments and statistics; and, at the discretion of the instructor, limiting and maintaining access to lessons via student directories.

Statistics are collected and stored automatically. Statistics included are the mean, variance, and standard deviation of student scores; summary of answer selections; response time statistics; the names, execution times and execution dates of lessons and student comments; and summaries of failed questions. The programs are modular and enable the instructor to obtain reports on particular lessons, questions, or students.

Minimum Education Level:
All levels, including adult and industrial education.
Language: BASIC-PLUS

Operating System: RSTS/E

Developed By: Digital Equipment Corporation. Its present version, Version II, includes extensive revisions, modifications, and enhancements developed in cooperation with the Purdue University Computing Center in West Lafayette, Indiana.

Availability: Contact your local DIGITAL office.

For More Information: A brochure on DECAL—Enhancing the Art of Teaching is available from DIGITAL EQUIPMENT CORPORATION Education Computer Systems Group Media Response Manager—PK3-2/M94 129 Parker Street Maynard, Massachusetts 01754 Order Part #EA-09896-87.
ECOMSETS

Description:
ECOMSETS (Educational Computer-based Models for Socio-Economic-Technological Situations) is a series of 25 transportable FORTRAN IV programs dealing principally with energy, economics and the environment. An introductory World Energy Model is the most widely used model in education. Other models include: the Seven-Reservoir World CO2, Forrester's World Two, Introductory World Food, and several ecological models.

Minimum Education Level:
College/University

Language:
FORTRAN IV

Operating System:
Independent

Developed By:
Group of faculty at Lehigh University through support from the National Science Foundation.

Availability:
W.E. Schiesser
Lehigh University
Whitaker No. 5
Bethlehem, PA 18015
Contact Lehigh faculty at above address or telephone: (215) 861-4264 or (215) 861-4137
Application: CAI/CMI/CAT

ELEMENTARY LEVEL INSTRUCTIONAL PACKAGE, VOLUME I

Description:
This series of 17 instructional programs is designed as supplemental instructional material for elementary school reading and math curricula, but can also be used for remedial or review work for older age groups. The programs provide drills on addition, subtraction, and multiplication in math and spelling and phonics in reading. One outstanding advantage of these drills is that students find out immediately—before they go on to the next problem—how well they performed and are given appropriate congratulatory messages or helpful hints for solution. Most of the programs offer the user a choice of easy, medium, or hard problems to meet varying student abilities.

Although the programs do not maintain records of student performance for later teacher analysis, the programs do type out the student's score—number of problems tried, number correct, and percentage correct—at the end of each program session.

ADDIT1 Adding numbers in columns.
SUB Subtracting numbers in columns.
FLASHA Addition of small numbers within a time limit, giving a "flash card" experience.
FLASHM Multiplication of small numbers within a time limit, giving a "flash card" experience.
MULT Multiplication of small or large numbers much like it's done with pencil and paper.
MULT1 Multiplication of one- to three-digit numbers by one-digit numbers.
CLOCK Helps students learn to tell time and recognize representation of time in numbers and in formal and informal words. A clock face is produced on the terminal.
COUNT Practice in recognizing numbers in series.
STORY Word problems requiring addition or subtraction.
ADDFRA Concept of common denominator and drill in addition of fractions.
PHONIC Program for use with workbooks in the "Phonics We Use" series published by Lyons and Car-
nahan. Exercises include story completion, identification of suffixes or prefixes, and others.

**SPELL**  Multiple choice drill allows students to pick out misspelled words.

**BLASTO**  Applying additions to winning a game.

**SQUARE**  Guessing game on square roots.

**CUBE**  Guessing game on cube roots.

**WORD**  Game in which a student tries to guess a four letter word.

**WORD3**  Game in which a student tries to guess a three-letter word.

**Minimum Education Level:**
All

**Language:**
BASIC-PLUS

**Operating System:**
RSTS-11

**Developed By:**
Robert A. Huntsman

**Availability:**
DECUS (to members only)
Order #RSTS11-43 or

**Contact:**
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-2578
EUX I: ENGLISH USAGE EXERCISES I

Description:
English Usage Exercises I (EUX) is a set of 96 computer terminal sessions that explore verb-pronoun relationships that often reflect written usage problems for many students. The intended audiences for EUX are intermediate, middle, and junior high school levels. Each EUX session is composed of a short didactic lesson and a set of sentence exercises. Each session is designed for an average sitting of 10-12 minutes. The 96 sessions, grouped in 21 series topics, follow a developmental and sequential format.

A companion volume, A CAI Approach to the Development of English Skills: English Usages Exercises I, has been published, essentially being a guide for the classroom teacher.

EUX II, a volume of 102 lessons that continues the topics and contents of EUX I, is now available.

Minimum Education Level:
Elementary — Grades 4-6

Language:
BASIC

Operating System:
RSTS/E

Developed By:
Peter J. Quinn
Robert L. Williams
St. John’s University, New York

John G. Allee
George Washington University
Washington, D.C.

Availability:
Available for the cost of handling to public and private elementary and secondary schools.

Contact:
Dr. Robert L. Williams
St. John’s University
Grand Central and Utopia Parkways
GENIE (COMPUTER GENERATED INSTRUCTIONAL MATERIALS)

Description:
GENIE is a total software package that provides a truly versatile CATC system for all curriculum areas and at all levels. With GENIE, teachers can easily produce multiple copies of equivalent tests, and their students can be provided with review and remedial materials keyed to their individual needs. GENIE also affords an excellent support for the evaluation of classroom performance objectives and competency testing.

With GENIE, teachers can, individually or in groups, write original questions properly suited for their own use. GENIE's unique BASIC-like author language allows simple questions to be written quickly and easily, while permitting an abundance of options for the more experienced author. GENIE also permits variation to occur within each question, so that a single library question will produce a large number of "different" printed questions. This feature is further enhanced by very comprehensive computational and logic capabilities.

Most teachers will use GENIE to prepare printed worksheets from existing libraries. Clearly written documentation makes it easy for these teachers to design and request their worksheets. By means of a series of brief commands, the user may specify the number and selection of questions to be printed, the number of equivalent copies desired, and many optional formatting features, such as titling, special instructions, paging, and the like. GENIE materials are designed for printing either directly at a terminal or on a lineprinter. If 132-column paper is available, questions and answers are printed side by side. On narrow paper, the answers will be printed separately.

A question library may contain up to 1000 questions, and GENIE places no limit on the number of libraries that may be built.

The entire GENIE system is carefully and completely described in a comprehensive and easy-to-read documentation booklet.

Minimum Education Level:
Elementary

Language:
FORTRAN IV ANSI Standard

Operating Systems:
RSTS/E
Developed By:
Allan H. Paschke and Raymond F. Bentsen

Availability:

Contact:
RAYALCO
712 S. Fairview
Park Ridge, Illinois 60068
(312) 692-7422
GERMAN (ADJECTIVE ENDING GAME)

Description:
GERMAN is a test on German adjective endings in certain sentences. The user tells the number of sentences he wants. An adjective ending is left out of each sentence; the user must supply the correct ending. If he is correct, he will proceed to the next question; if not, he will be told the correct answer and why it is correct. There are 68 possible sentences to be asked. These are in a data file, and GERMAN gets random ones for the user.

GEDIT is a special program for the game GERMAN which can change or create the data file used, GERMAN.DAT. The data file used is a virtual array, while the raw data file is not. GEDIT was written to convert the raw data (included in this package) into the virtual array. Also, if there is a mistake of spelling or grammar or new sentences to be entered, this program can perform the necessary changes.

Minimum Education Level:
All

Language:
BASIC

Operating System:
RSTS/E Version 7.0

Developed By:
Fred White
Mankato State College
Mankato, Minnesota

Revised By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

Availability:
All
Order #RSTS11-18
ICSP: INDIVIDUALIZED COMPUTATIONAL SKILLS PROGRAMS

Description:
ICSP, a supplementary arithmetic skills program designed for elementary and secondary school students, was developed and tested during a seven-year project in Flint, Michigan. ICSP succeeded in raising the average arithmetic skill level of the students in the Flint community schools from below the national norm to a level equal to or above the national average as measured by standardized tests.

ICSP is designed to:
- Correctly assess a student's grade-level competence in arithmetic skills
- Pinpoint the specific area of weakness
- Provide an individualized range of prescriptions for weaknesses as they occur
- Provide a skill-by-skill daily record of student progress

Minimum Education Level:
Elementary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Time Share Corporation
Educational Division
630 Oakwood Avenue
West Hartford, Connecticut 06110
(203) 522-0136

Availability:
Price varies depending on number of users. For more information, contact developer directly.
INRAN, OUTRAN (COMPUTERIZED QUESTION GENERATION # 2)

Description:
This package allows an instructor to generate tests with any number of questions chosen at random from a database containing a large number of questions. For example, a database of 50 questions could be created, and each test could be made to consist of 20 questions chosen at random from among the 50. Test and answer keys are printed separately. The programs can be told to create a given number of tests or (using the NAMES program from DECUS No. RSTS-11/23 or PIP) a student name file can be created and the tests and answer keys will be printed according to the student names in the file.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Digital Equipment Corporation

Availability:
DECUS (to members only)
Order #RSTS11-31
NAMES & CEMGEN (COMPUTERIZED QUESTION GENERATION)

Description:
This package consists of two programs: NAMES and CEMGEN. The programs are designed to serve as an example of the type of operation particularly well-suited to a computer.

CEMGEN produces 10 questions dealing with the weight and number of atoms in samples of elements and exercises in balancing equations. The questions themselves can easily be replaced with other questions from any subject area dealing with mostly numeric answers. CEMGEN takes a standard format question, generates random numbers for the given numeric values, thereby customizing each test, quiz, or homework assignment. CEMGEN then proceeds to output the test and an answer key.

If the NAMES program is used to create a file of student names, CEMGEN will produce a different test for each student in the name file (with a form feed between tests). It will also produce a keyed answer sheet with answers to each question noted for each student. The answer sheet is produced student by student. If NAMES is not used, CEMGEN will produce one test and answer sheet, then ask if another is to be created.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Digital Equipment Corporation

Availability:
DECUS (to members only)
Order #RSTS11-23
PHONETICS AND COMPREHENSION PACKAGE

Description:
The Phonetics and Comprehension Package is built around a database of over 3000 elementary level words. The words are indexed and a sentence using each word is provided. A drill set of programs use these words and sentences in a multiple choice question format. There are subsets of word arranged into six levels of difficulty. A time limit option is available for most programs. The following lists contain a set of utility programs to print and update the files:

SOUNDS — 48 drills on sounds and rhymes
MAGICE — Drill on silent E pairs (FAT/FATE etc.)
ANT — Drill on antonyms
SYN — Drill on synonyms
HOM — Drill on homonyms
PARTOF — Drill on the 'part of' relationship
ANALOG — Drill on analogies (A is to B as C is to D)
HANG — Super Hangman game
SHANG — The SPEED version of Hangman
GUESS — Guess the word that will fill the blank
FIND — Find a list of hidden words (Take Home Puzzle)
PRINT — Prints various lists from database
WENTER — Enters new words and sentences into word list
IENTER — Enters new indices into index file
IEDIT — Add and Drop words from indices

Minimum Education Level:
All

Language:
BASIC-PLUS

Developed On:
RSTS/E

Developed By:
John Cartan

Availability:
Contact John Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
READING PACKAGE

Description:
The package consists of two programs, READT and READER. READT is the program used by the teacher to input stories and test and delete the same. READER is the program run by the student. It must be run on a scope terminal. The program was written for a Beehive Mini-bee IV; however, minor modification would make it work on other scope terminals. The program displays on the scope one line or phrase at a time for the student to read. The line is erased and the next line appears. The time for which the line appears can be changed to encourage speed reading. A comprehensive test is given at the end of the story.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Robert A. Huntsman

Availability:
Contact John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7450
STRIDE (READING SKILLS PROGRAM)

Description:
STRIDE is a competency-based program of reading skills designed for students in grades four through six or for remedial use at higher grades. Each grade level covers three skill categories: Word Attack, Vocabulary and Comprehension, and Study Skills. The teacher has the capability of assigning students any skill or sequence of skills, as well as accessing individual student and class print-outs.

Minimum Education Level:
Elementary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Time Share Corporation
630 Oakwood Avenue
West Hartford, Connecticut 06110
(203) 522-0136

Availability:
Price varies depending on number of users. For more information, contact developer directly.
ADVANCED CONTINUOUS SIMULATION LANGUAGE (ACSL)

Description:
The Advanced Continuous Simulation Language has been developed to help the engineer or scientist analyze dynamic response, given a mathematical description of the system. Designed for modelling the behavior of continuous systems described by time-dependent, nonlinear differential equations or transfer functions, the ACSL system helps design engineers express their models for complete solution by eliminating extraneous statements and by providing an extensive sequence of programs associated with obtaining data output and particularly plots or pictures.

Features of ACSL include the following:
- Online interaction with the simulation model.
- Full FORTRAN compatibility: Any system or user library may be accessed.
- Choice of integration routines—includes Gear's algorithm for stiff systems.
- Complete dictionary formed for symbolic access to all variables by SET, DISPLAY, PLOT, PRINT, RANGE, etc.
- No limits on program size: Any number of names, states or labels may be used.
- Follows standards established by CSSL Technical Committee in 1967.
- Array capabilities complemented by vector and matrix integration operators.
- Simple structure with default options for the novice; advanced facilities for the experienced user.

ACSL can be run interactively or from batch; pictures or plots can be obtained on a lineprinter, character terminal or a wide variety of line plot devices.

Minimum Education Level:
Knowledge of Calculus

Language:
FORTRAN

Operating System:
VAX/VMS
Developed By:
Edward E. L. Mitchell and Joseph S. Gauthier
Mitchell and Gauthier Assoc. Inc.
801 Main Street
Concord, Mass. 01742

Availability:
Contact developer directly at the above address or telephone: (617) 369-5115.
ANALOG COMPUTER SIMULATOR

Description:
Simulates an AMF/665/D analog computer. It has a constant, three
adders which also act as scales, two integrators, and a meter.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E or RSTS Version 4A

Developed By:
Clark Baker
DSAA: Project DELTA
University of Delaware
Newark, Delaware

Availability:
DECUS (to members only)
Order #RSTS11-38
APAS—ARRAY PROCESSOR APPLICATION SOFTWARE

Description:
APAS is a set of FORTRAN application programs which enhance the performance of signal processing operations. It is specifically designed to support the Floating Point Systems (FPS), Inc. array processors. The APAS programs are an option to the Interactive Laboratory System (ILS) which is a comprehensive software system for interactive signal processing.

The APAS software takes advantage of the high speed array processor for doing Fast Fourier Transform (FFT) and other types of vector operations, thereby enhancing the performance of standard FORTRAN programs which normally execute in the host computer only.

For those who have previously installed the ILS software, APAS allows the customer to begin using the array processor hardware without initial software development, for applications such as FFT and IFFT, Digital filtering, autoregressive analysis, cepstral analysis, spectral-density estimation, and spectral analysis with 3-D displays.

The speed enhancements provided with APAS vary depending on the Digital computer systems and FPS array processor selected.

Minimum Education Level:
B.S. Degree

Language:
FORTRAN

Operating System:
VAX/VMS, RSX-11M

Developed By:
Signal Technology, Inc.
15 W. De La Guerra St.
Santa Barbara, CA 93101

Availability:
Contact developer directly at the above address or telephone: (800) 235-5787, (805) 963-1552.
CANTRAN-11 STUDENT PROGRAMMING SYSTEM

Description:
This system provides an operating system, editor, FORTRAN compiler and run-time system, PASCAL compiler and run-time system, many utilities and several FORTRAN applications packages. The most important features of the system are its reliability and its ability to support thousands of beginner users on a 10 - 20 terminal PDP-11/34 with multiple LS-120 printers and as few as two or three RL01 disk drives. Up to a few hundred jobs an hour can be processed; FORTRAN compiles at up to 6000 lines/minute and PASCAL at up to 500, 50 - 80% faster if CACHE memory is available. Job control is very simple with compatible input on VDU's or card reader. A very secure and efficient disk file structure holds source files with blank fields suppressed. Adequate provision is made for users to submit and update data files to be processed by user written package programs. System performance and accounting information and statistics are maintained on disk. A substantial subset of FORTRAN IV including free format I/O and character string constants is available, and a very good version of PASCAL. Both languages include plain English compile and run-time error messages with run-time errors identifying the source statement line number being executed at the time of the error. The system has been running productively since February 1978 and is sufficiently reliable for software maintenance to be virtually unnecessary.

Minimum Educational Level:
Secondary

Language:
MACRO-11

Operating System:
Standalone

Developed By:
Computer Centre
University of Canterbury
Christchurch 1, New Zealand

Availability:
Contact A.D. Causer at the address above.
Application: Computer Science/Languages

DELTA EDUCATIONAL COMPUTING SYSTEMS — DATA PROCESSING PROGRAMS

Description:
Programs included are:

STOPB  Simulates a simple digital computer with a defined machine language.

BRAIN  Simulates a simple digital computer with a defined machine language more complex than STOPB.

ADDRES  Prints addresses on labels.

SORT  Performs ascending or descending sort on simple ASCII file.

XREF  BASIC program listing and cross-reference generator.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

Availability:
DECUS (to members only)
Order #RSTS11-48
EZMARK SYSTEM FOR EDUCATIONAL PROCESSING

Description:
Ezmark uses mark-sense cards to process student programs in RPG, COBOL, FORTRAN, BASIC, or any RSTS/E supportable language. The coding on the card is easy to learn and use. The same type of card is used for all applications.

If a card reader and a printer are devoted to student use, programs can be submitted continuously for processing. Control cards serve to identify the language that is being used.

A major advantage of the system is that students are no longer tied down to keypunches or terminals for program preparation. Schools should realize a substantial savings because expensive data entry equipment is not needed.

The system was developed by Thomas P. Lee, a community college instructor, and has been tested and used in a community college environment.

Minimum Educational Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Thomas P. Lee
2360 Orangeside Road
Palm Harbor, Florida 33563

Availability:
Current price is $4,000.00 to educational institutions. For more information contact developer directly at above address or telephone: (813) 784-8265.
Application: Computer Science/Languages

LOGO FOR RSTS/E

Description:
The LOGO language was invented by Seymour Papert and his colleagues at the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology. This version of LOGO is based on Papert's LOGO (which was designed for unusual peripherals) and supports the MIT Turtle, Tektronix 4006-1 and conventional terminals for turtle geometry.

LOGO forms a highly structured programming language based on a small set of primitives which are used by the programmer as building blocks to form complex procedures.

LOGO has been used successfully with primary school students as well as at secondary and college levels.

Minimum Educational Level:
All

Language:
MACRO-11

Operating System:
RSTS Version 6C

Developed By:
Elizabeth Computer Centre
256-274 Elizabeth St.
Hobart, Tasmania
Australia 7000

Availability:
For details or price and availability of manuals etc. Contact the Coordinator of Education Computing at the above address. (At present the package sells for $A360).
MICROSIM

Description:
MicroSim is an interactive microprocessor software development system consisting of cross-assemblers and simulators. Versions exist for the Intel 8080/8085/8048, Motorola 6800, RCA 1802 and Zilog Z80 microprocessors. Assembly and link loading is transparent to the user giving the operational ease of an interpreter while producing pure object code for the target microprocessor. Software generated on the host computer may be transferred directly or indirectly to in-circuit emulation equipment or the target system.

The main features of the system are:
- line by line assembly giving instant program execution
- diagnostic messages that refer to the source rather than object code
- an internal clock which computes the time needed to run the software in the target system
- input/output simulation
- byte segregation which differentiates between data, instruction and address bytes.

The automatic linking of program segments encourages the development of modular, well structured software, and the "interpreter-like" approach can greatly improve programmer productivity.

Minimum Education Level:
Familiarity with Assembler Language of Chosen microprocessor.

Language:
FORTRAN

Operating System:
RSTS/E, VAX/VMS, RSX-11M

Developed By:
D.M. England and Partners Ltd.
211 High Street
Twyford,
Berkshire, RG10 9AG, England

Availability:
P. Andell
PACTEL
Rochester House
33 Greycoat Street
London SW1P 2QF, England
London 828-7744
Application: Computer Science/Languages

MIGIT (ASSEMBLY LANGUAGE SIMULATOR)

Description:
MIGIT is a symbolic language developed to aid a beginning programmer in the understanding of an assembly language. MIGIT is the counterpart of the machine language called SADSM. The opcodes in both SADSM and MIGIT are compatible; that is, the coding of MIGIT is translated into SADSM, and all SADSM coding can be easily converted to MIGIT. An assumption is therefore made that the MIGIT programmer has programmed in SADSM.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Dennis Washa
University of Wisconsin
Platteville, Wisconsin

Availability:
DECUS (to members only)
Order #RSTS11-50
MINI-DYNAMO

Description:
DYNAMO is a continuous simulation language for building computer models of dynamic systems easily. It allows the modeler to represent stocks and flows in a system, plus the information feedback from the stocks to the flows. Since 1959, DYNAMO has been used extensively to model industrial, governmental, biological, ecological, economic, and physical systems. Two of the best known applications of DYNAMO are Forrester’s *Urban Dynamics* and Meadows’ *Limits to Growth*. DYNAMO offers several advantages:

- It is easily learned.
- It provides clear error messages.
- It produces clear tabular and graphical output.
- It allows the modeler to change model parameters and return the model easily.

Mini-DYNAMO is an interpreter for DYNAMO, operating in either interactive or batch mode. Mini-DYNAMO has a number of options that can be used to tailor output to the characteristics of the output device and to the modeler’s needs. Mini-DYNAMO comes with a user’s guide written in nontechnical language, suitable for use at high school, undergraduate, or graduate levels. Forrester’s *Principles of Systems* and Pugh’s *DYNAMO User’s Manual* can be used as texts for teaching DYNAMO modeling.

Minimum Education Level:
Secondary

Language:
FORTRAN

Operating Systems:
RSTS/E, VAX/VMS

Developed By:
Pugh-Roberts Associates, Inc.

Availability:
Please contact:
Mr. D. Ross Hunter
Pugh-Roberts Associates, Inc.
OMSI PILOT-73

Description:
OMSI PILOT-73 enables RSTS/E Version 5 to understand "core PILOT" by translating it to BASIC-PLUS. Although the initial translation can take as much as five minutes, the output BASIC-PLUS program runs faster than interpretive versions.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E Version 5

Developed By:
Jim Hollcraft
Oregon Museum of Science and Industry
Portland, Oregon

Availability:
DECUS (to members only)
Order #RSTS11-84
RJ-11 COBOL

Description:
RJ-11 COBOL consists of a compiler, run-time system and supporting programs designed to run on a PDP-11 using RSTS/E.

It has been specifically designed for small business applications.

This language implementation is based on the 1974 ANSI level 2 standard. The implementation is remarkably complete, and includes:

- INSPECT, STRING and UNSTRING verbs
- SORT verb
- Condition names
- COMPUTE verb
- Complex conditions
- Expressions
- Program chain and overlay functions
- 16 decimal places of decimal accuracy
- COPY verb
- Character, packed-decimal, and binary representation of data.

Several facilities not in the ANSI standard have also been made available:

- Provision for two types of ISAM files
- Two techniques for processing files with variable length records.
- An interactive, dynamic "debugging" facility
- Automatic line counter to simplify report generation.
- Enhanced interactive screen functions—cursor positioning and echo-inhibit.
- A capability to specify files at run-time.

In addition, utility programs are provided to print the contents of files or program results, sort files, create files, update files, and extend files.

Minimum Education Level:
Basic knowledge of COBOL

Language:
MACRO-11
Operating System:
RSTS/E

Developed By:
Dr. Rick Jamieson

Availability:
Eric Dickman
EEC Systems
286 Boston Post Road
Wayland, MA 01778
(617) 358-7781
ROGALGOL: (ALGOL-60 FOR THE PDP-11)

Description:
ROGALGOL is a system for running the language ALGOL-60 on a minicomputer. Its main features are 1) ease of use, 2) economic use of memory combined with a relatively fast execution speed, and 3) the ability to run on and use effectively any hardware configuration subject to a minimum of 8K words and a slow I/O device such as a Teletype. It consists of a one-pass compiler, which is written in ALGOL, and a run-time program. All the main facilities of ALGOL-60 are implemented, the chief exception being that the calling of procedure parameters by name is limited to those cases in which it is equivalent to calling by reference. The compiler produces a very compact intermediate code requiring about five words for an average statement. The run-time program contains a loader which reads the compiler output into memory and then interprets it. The speed is usually limited by the floating point software on machines which do not have floating point hardware, so the advantage of a compact semi-compiled code is obtained without a significant sacrifice of speed. A simple method of calling machine code is provided, and this is used for all input/output transactions. This makes it possible to adapt the system to use any peripherals available.

On the PDP-11, either two-word or four-word precision floating point numbers can be used without recompiling the program. Any type of floating point hardware can be used; and when it is available, execution is faster than BASIC-PLUS but slower than FORTRAN IV.

Minimum Education Level:
Suitable for teaching beginners. The document describes the language in detail but would not be suitable as a self-teaching manual for complete novices.

Language:
The compiler is written in a subset of ALGOL and is self-compiling. The interpreters are written in MACRO (PDP-11).
Operating Systems:
VAX/VMS, RSTS

Developed By:
Dr. Roger H. Abbott
University of Oxford

Availability:
Dr. Roger H. Abbott
RHA (Minisystems) Ltd.
83 Gidley Way, Horspath
Oxford OX9 1TQ
England

A single machine perpetual license costs 250 pounds or $500 for commercial users.
SADSM (MINICOMPUTER SIMULATION)

Description:
This program emulates the language SADSM and is geared to teaching beginning students in computer science. The program simulates a minisystem, making it a good tool for more advanced students who are interested in the component characteristics of a computer system.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Dennis Washa
University of Wisconsin
Platteville, Wisconsin

Availability:
DECUS (to members only)
Order #RSTS11-49
Application: Computer Science/Languages

S-ALGOL

Description:
S-ALGOL is a structured, high level programming language used for teaching programming and writing applications and systems software. The VAX-11 system is a re-entrant native mode compiler and is written entirely in S-ALGOL itself. The major facilities of the language are:

Simple data types—integer, real boolean and string

Compound data types—vector and structure

Dynamic vectors and run-time structure class checking

Dynamic constants i.e., names initialized to run-time values that remain constant — for both simple and compound objects

Dynamic strings—variable length with concatenation and substring selection operations

For, while and repeat control structures

If-then-else and case conditional clauses

No goto statement

Procedures and functions with call by value parameters

A one-to-one correspondence between declarative types and parametric types

Orthogonal design with no special rules

Access to VAX/VMS file system

Separate compilation of procedures

Stream I/O

Annotated program listing option

Cross reference listing option

Dynamic flow summary option

Extension for interval arithmetic

Extension for graphics system

Minimum Education Level:
Suitable for beginners

Language:
S-ALGOL
Operating System:
VAX/VMS

Developed By:
Dr. Ronald Morrisea
University of St. Andrews

Availability:
Contact Dr. Ronald Morrisea
University of St. Andrews
Dept. of Computational Science
North High
St. Andrews, Fife KY 16 8 X5
or telephone: St. Andrews 76161
Application: Computer Science/Languages

SIMSCRIPT II.5

Description:
SIMSCRIPT II.5 is an English-like Simulation language.

The readability of SIMSCRIPT II.5 in combination with its structure is of great practical value since most models evolve overtime: programs keep changing in the light of new information, new requirements, new insights. In most languages this listing is unreadable and useless as documentation.

Not so with SIMSCRIPT II.5. Because each component of a SIMSCRIPT II.5 model is a readable, self-contained subroutine, the program listing can be understood even by users who are not programmers, and—importantly—a programmer can modify a model written by someone who has gone on to other things.

A training course that utilizes the SIMSCRIPT II.5 language is also available to provide a working understanding of the use of simulation modelling for analysis. It is based on practical real-world applications and thus provides a realistic view of the advantages of simulation and of methods and techniques that can help to avoid its pitfalls.

The transparencies used in the course are available in paper form.

Minimum Education Level:
College or University

Language:
Assembler

Operating System:
VAX/VMS

Developed By:
CACI
12011 San Vicente Boulevard
Los Angeles, California 90049

Availability:
Contact J.S. Aninño at the above address or telephone: (213) 476-6511.
Application: Computer Science/Languages

SPITBOL

Description:
SPITBOL for the VAX and PDP-11 series of minicomputers is a full implementation of the SNOBOL4 programming language. VAX SPITBOL and PDP-11 SPITBOL are completely compatible with other implementations of MACROSPITBOL. It will also accept most programs written for the SNOBOL4 and SPITBOL on the IBM370 without modification. The VAX SPITBOL translator runs in the native instruction mode of the VAX computer and takes full advantage of the extended addressing and virtual memory capabilities of the machine.

Most SNOBOL4 programs will operate correctly when compiled and executed under SPITBOL. There are a few minor incompatibilities and some features of SNOBOL4 have not been implemented (notably the QUICKSCAN mode of pattern matching and the capability to redefine standard systems functions and predefined operators). On the other hand, SPITBOL contains many useful enhancements to the SNOBOL4 language, including an expanded TRACE function for improved debugging of application programs, and several additional built-in functions for sorting data items and facilitating the output formatting and comparison and manipulation of strings.

Minimum Education Level:
Secondary

Language:
Assembly Language

Operating System:
RSTS/E, VAX/VMS

Developed By:

Availability:
Dewar Information Systems Corp.
221 West Lake Street
Oak Park, Illinois 60302
(312) 524-1644
Application: Computer Science/Languages

SP/K (A SYSTEM FOR TEACHING COMPUTER PROGRAMMING)

Description:
SP/k is a compatible subset of the PL/1 language that has been designed for teaching programming. The features of the SP/k language were chosen to encourage structured problem solving by computers, to make the language easy to learn and use, to eliminate confusing and redundant constructs, and to make the language easy to compile. The resulting language is suitable for introducing programming concepts used in various applications including business data processing, scientific calculations and non-numeric computation.

Efficient, diagnostic and reliable SP/k processors have been implemented for the PDP-11. Textbooks are available that present a structured approach to programming in terms of the SP/k language.

SP/k is actually a sequence of language subsets called SP/1, SP/2,...SP/8. Each subset introduces new programming language constructs while retaining all the constructs of preceding subsets. Subset by subset, the included constructs are:

SP/1: expressions and output
SP/2: variables, assignment and input
SP/3: control constructs
SP/4: character manipulation
SP/5: arrays
SP/6: procedures
SP/7: formatted input-output
SP/8: structures and files

Each subset is precisely defined and can be learned or implemented without the following subsets.

Minimum Education Level:
Secondary

Language:
Compatible subset of PL/1

Operating System:
RSTS/E

Developed By:
Computer Systems Research Group
216 Sandford Fleming Building
University of Toronto
10 King's College Road
Toronto, Ontario, Canada M5S 1A4
(416) 978-8726

Availability:
Contact developer directly.

For More Information:
Contact developer directly.
TUTOR

Description:
TUTOR was written to teach the use of the computer, but can be adapted for other teaching purposes as well. Provisions are made for review work and for progressively more difficult tasks.

Minimum Education Level:
Elementary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Robert Lekman
Riverdale Country School
Bronx, New York

Availability:
DECUS (to members only)
Order #RSTS11-88
Application: Computer Science/Languages

WATBOL-11 (WATERLOO COBOL_COMPILER)

Description:
WATBOL-11 is a fast in-core COBOL compiler. Developed to satisfy requirements in the areas of education, research, and industry, WATBOL-11 is designed to expedite the development and debugging process. WATBOL-11 accomplishes this by combining fast compilation (over 1000 statements per minute on a PDP-11/45), simplified operating procedures, and extensive error diagnostics (both at compile- and execution-time).

WATBOL-11 is designed to be compatible with the DEC COBOL compilers and ANSI Standard COBOL. The implementation contains the COBOL nucleus, full sequential file support, and basic table-handling features. Fully qualified data-names and all types of expressions are allowed.

Textbooks and other educational material, as well as additional software, are available for use with WATBOL-11. When used with the special COPY features, the WATBOL-11 compiler becomes a powerful teaching tool enabling students to run programs successfully after their first lecture.

Minimum Education Level:
Secondary

Language:
MACRO-11

Operating System:
RSTS/E, VAX/VMS (compatibility mode)

Developed By:
Waterloo Foundation for the Advancement of Computing (WATFAC),
Waterloo, Ontario, Canada

Availability:
Computer Systems Group
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1

An annual maintenance fee of $600 includes distribution, documentation, telephone support, and periodic updates.
For More Information:
Contact Sandra Ward at the above address or by calling (519) 885-1211, extension 3268.
Application: Computer Science/Languages

WATFAC STRUCTURED MACROS

Description:
Structured programming is a technique which has been successfully applied to control costs in programming projects. A collection of macros has been designed so that programmers in MACRO-11 can use the techniques of structured programming while programming in assembly language. These macros have been used in the WATBOL-11 COBOL compiler, the WIDJET terminal system, and several other large-scale projects. The following are provided:

1. CALL and RETURN statements for invoking and returning from subroutines
2. IF-ELSE-END statements for conditional execution of sequences of instructions
3. Statements for controlling loops

Other facilities for implementing simple block structures are included as well.

A manual is provided with the macro package. This manual is written to serve as a tutorial for the macros, as well as a reference manual.

Minimum Education Level:
Secondary

Language:
MACRO-11

Operating System:
RSX-11D, RSX-11M, RSTS/E

Developed By:
Waterloo Foundation for the Advancement of Computing (WATFAC),
Waterloo, Ontario, Canada

Availability:
Computer Systems Group
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1

A single charge of $30 is assessed to help cover costs of handling and the manual.
For More Information:
Contact Sandra Ward at the above address or by calling (519) 885-1211, ext. 3268.
WATFAC UTILITIES

Description:
The WATFAC Utilities are a collection of programs and routines for the DIGITAL RSX-11D operating system. Items in the package can be separated into two classes: debugging aids and utility programs. The package has evolved during the development of the WATFOR-11 FORTRAN compiler, the WATBOL-11 COBOL compiler, and the WID-JET terminal system. It is expected that this evolution will continue as new items are added and existing items are enhanced. The debugging portion of the package consists of three components:

1. ZAP: a program which is used to inspect and modify task files. Addresses can be referenced in the symbolic fashion (global name + offset) most convenient to the programmer.

2. TRACE: a collection of routines which monitors the execution of a program at the machine-instruction level. A before/after snapshot of selected instructions and their effect (i.e., memory modification) is provided.

3. SPRTRC: (Super Trace) a collection of routines used in conjunction with TRACE to specify what debugging information is required for a given test of a developing program.

These three utilities increase the productivity of programmers by decreasing the amount of time spent debugging programs.

The second collection of components is a set of useful programs to perform utility functions:

1. XRF: provides a cross-reference of the symbols used in a MACRO-11 program.

2. LRD: provides a listing, in octal, of the logical records in a file.

3. TAB: produces a file in which tab characters replace redundant blanks in an input file. This program may substantially reduce the amount of space occupied by a source file (FORTRAN, MACRO-11, COBOL).

A reference manual is provided with the WATFAC Utilities package. This manual describes how to use the utilities and suggests applications for them.

Minimum Education Level:
Secondary

Language:
MACRO-11
Operating System:
RSTS/E

Developed By:
Waterloo Foundation for the Advancement of Computing (WATFAC),
Waterloo, Ontario, Canada

Availability:
Computer Systems Group
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1

An annual maintenance fee of $200 includes distribution, documentation, telephone support, and periodic updates.

For More Information:
Contact Sandra Ward at the above address or by calling (519) 885-1211, ext. 3268.
WATFOR-11 (WATERLOO FORTRAN COMPILER)

Description:
WATFOR-11 is a fast in-core FORTRAN compiler. Developed to satisfy requirements in the areas of education, research, and industry, WATFOR-11 is intended to expedite the debugging process. This is important in education, since almost every program is in the development stage as students prepare class assignments.

WATFOR-11 provides specially designed error messages at both compile and execution time. These messages identify the precise FORTRAN statement at which the error occurred, thus permitting the programmer to debug at the FORTRAN level. The WATFOR-11 compilation process takes place at an average speed exceeding 1000 FORTRAN statements per minute on a PDP-11/45 system.

WATFOR-11 is compatible with DIGITAL’s FORTRAN IV and FORTRAN IV-PLUS compilers and IBM 360 WATFOR. Extra language features are provided, which are designed to make programming easier. The “free format” feature on input/output requires no format statement on either input or output. Thus students are not required to learn the details of the format statements in order to run programs.

Several excellent textbooks exist which support the use of WATFOR for both teaching and reference.

Minimum Education Level:
Secondary

Language:
MACRO-11

Operating System:
VAX/VMS, RSTS/E

Developed By:
Waterloo Foundation for the Advancement of Computing (WATFAC),
Waterloo, Ontario, Canada

Availability:
Computer Systems Group
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1
An annual maintenance fee of $600 includes distribution, documentation, telephone support, and periodic updates.

For More Information:
Contact Sandra Ward at the above address or by calling (519) 885-1211, extension 3268.
Application: Engineering

AID

Description:
AID provides a practical approach to resolving one of the difficult issues which can be critically important to the success of a simulation project. Designed to complement formal statistical methods, AID guides the analyst through an interactive procedure to select a suitable statistical model of observed data. AID eliminates many of the tedious steps involved in this selection process and supplies valuable information from which to assess the accuracy of a proposed statistical model.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
Pritsker and Associates, Inc.
P.O. Box 2413
West Lafayette, IN 47906

Availability:
Contact developer at the above address or telephone: (317) 463-5557.
DACS—DATA ACQUISITION AND CONVERSION SYSTEM

Description:
DACS is a library of FORTRAN callable subroutines for digital-to-analog and analog-to-digital conversion of data, data compression/expansion, and efficient disk file input/output. DACS interfaces the Digital Equipment Corporation LPA-11K Laboratory Peripheral Accelerator hardware and software operating on VAX or PDP-11 computers to a user-oriented FORTRAN environment.

DACS allows for multi-channel input and output to/from disk in dedicated mode while under FORTRAN control. In addition, non-linear scaling is optionally available for compressing 12-bit A/D samples to 8-bit byte representations in real-time. These samples are efficiently stored on the disk and then expanded back to linear 12-bit samples at the D/A output. Both A-law and μ-255-law compression tables are provided with DACS. DACS incorporates fast and efficient input/output MACRO routines for data transfer to/from disk.

The maximum aggregate sampling rate available to the user is determined by the LPA-11K hardware specifications, disk drive transfer rates, priority level and system loading. Typical maximum aggregate sampling rates to/from disk are near 50 kHz, and rates to/from memory buffers are near 150 kHz.

DACS functions as a software interface to Signal Technology's Interactive Laboratory System (ILS), an organized software package for high-level user-oriented digital signal processing.

Minimum Education Level:
B.S. Degree

Language:
FORTRAN, MACRO

Operating System:
VAX/VMS, RSX-11M

Developed By:
Signal Technology, Inc.
15 West De La Guerra Street
Santa Barbara, CA 93101

Availability:
Contact developer directly at above address or telephone: (800) 235-5787, (805) 963-1552.
Application: Engineering

ENGINEERING SCIENCE (CAL) PROGRAM EXCHANGE

Description:
Numerous Aeronautical Engineering, Civil Engineering, Electrical and Electronic Engineering, Mechanical Engineering, and Nuclear Engineering packages have been developed for use in undergraduate teaching of engineering. They are all interactive and many make use of graphical display. Students need have no knowledge of computer programming to make use of the programs, but an understanding of underlying theory is assumed. A package comprises a machine-readable source and associated documentation. Currently the number of packages available is 66.

Minimum Education Level:
College and University

Language:
ANSI, FORTRAN and BASIC

Operating System:
Many of the packages have been developed on PDP-11 systems under RSTS/E or RSX-11M but there is a high degree of system independence.

Availability:
Available to members of the Engineering Science Program Exchange.

Further details of membership and price lists may be obtained from:
Engineering Science Program Exchange
Faculty of Engineering
Queen Mary College
Mile End Road
London E1 4NS
Tel: 01-980 4811 ext 650 or 547
GPSS

Description:
The GENERAL PURPOSE SIMULATION SYSTEM for modelling discrete event systems is now available for VAX/VMS. This is an easy-to-use block-diagram language which permits a rapid analysis of a wide variety of real-life situations. Models are constructed using 44 powerful building blocks provided by the GPSS system. Behaviour of the model may be made to depend on conditions internal to the model itself by referencing some of over 70 Standard Numerical Attributes (SNAs) also built into the language. Statistics are automatically collected during the operation of a model and are printed at the end of the run. These include such items as equipment utilizations, waiting times and average and maximum queue lengths.

GPSS features several enhancements over more traditional GPSS implementations. In particular, the user may code arithmetic expressions for table arguments, function arguments and values as well as most block operands. Matrix Savevalues may be either memory or disk-resident. A disk-resident matrix file is treated as a "virtual" array by GPSS using VAX/VMS memory management facilities. To aid the user in debugging and validating the model, an interactive debugging package is provided. Using this feature, "breakpoints" may be set at particular blocks, model attributes may be examined and altered and transactions may be single-stepped through the model.

Advanced features of GPSS include reading and writing of external event streams (J0BTAPES) and the ability to call user-supplied FORTRAN subprograms (HELP blocks). Function point values for exponential and standard-normal distributions are supplied internally to GPSS and need not be entered manually.

Minimum Education Level:
College or University

Language:
BLISS

Operating System:
VAX/VMS

Developed By:
Simulation Software Design and Development
760 Headley Drive
London Ontario, CANADA N6H 3V8

Availability:
Contact Mr. David Martin at the developer's address or telephone (519) 679-3575.
GTSTRUDL (GEORGIA TECH STRUCTURAL ENGINEERING SYSTEM)

Description:
GTSTRUDL is a general purpose program designed to assist structural engineers to prepare data, manage structural engineering information, control analysis and design processes, and to display and interpret results. It is intended as an engineering design tool that performs information processing and frees engineers for problem solving and decision making.

GTSTRUDL integrates a variety of structural and finite element analysis, design, graphic display, and database management features in a single system. It is currently used by government agencies, industrial and engineering firms, and educational institutions for frame and finite element analysis and to design many types of structures, including building and roof support systems, antenna towers, hydraulic structures, thin shell structures, radar dishes, machine parts, and port and harbor structures. The system is intended to save engineering costs and increase productivity through automatic data generation and more efficient information management and design control.

GTSTRUDL will perform both linear static and dynamic analysis of structures composed of any combination of element types including five member types and more than 30 finite element types. Design of steel sections for framed structures and transmission towers is performed according to AISC, API, and ASCE specifications. Graphic display is in both two and three dimensions, and includes 3-D rotation, windowing, zoom, panning, hidden and boundary line removal, dotted lines, and split screen display. The program can be executed in either batch or interactive mode or with any combination of modes. All communication with GTSTRUDL is through a powerful, English-type, command-structured language called POL (Problem-Oriented Language).

Minimum Educational Level:
University

Language:
POL (Problem-Oriented Language), CDL, ICETRAN, FORTRAN, BLISS

Operating System:
VAX/VMS
Developed By:
GTICES Systems Laboratory
Georgia Institute of Technology
Atlanta, Georgia 30332

Availability:
Contact the developer directly at the above address.
MICROSOLVE

Description:
Microsolve is a FORTRAN IV Microcomputer-based state-of-the-art linear programming system.
Microsolve handles problems as large as 150 rows in a 64 KB machine. Solution times are very fast due to a completely new solution algorithm.
Microsolve can be expanded to handle much larger problems if desired.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS, RSX-11

Developed By:
W.G. Welter
Advanced Management Technologies
Box 1597
Houston, Texas 77057
(713) 373-1905

Availability:
Contact developer at the above address or telephone: (713) 977-9672.
MSC/NASTRAN

Description:
MSC/NASTRAN is a general purpose computer program that solves a wide variety of engineering analysis problems by the finite element method. The program capabilities include static and dynamic structural analysis including material and geometric nonlinearity, heat transfer, aeroelasticity, acoustics, electro-magnetism and other types of field problems. It has been successfully used by large and small companies throughout the world engaged in such diverse fields as automotive, aerospace, civil engineering, shipbuilding, offshore oil, industrial equipment, chemical engineering, optics and government research.

MSC/NASTRAN is famous for its ability to solve large problems in an accurate and efficient manner. Some of the features that allow for this capability are: sparse matrix routines, multilevel super-elements, cyclic symmetry, generalized dynamic reduction, and component mode syntheses. Other special features include MSGMESH, MSGSTRESS, MSGVIEW, automatic card-driven restart, automatic singularity suppression, automatic resequencing, and data checking with error analysis.

Minimum Education Level:
College and University

Language:
FORTRAN IV

Operating System:
VAX/VMS

Developed By:
MacNeal-Schwendler Corp.

Availability:
Contact developer directly:
Joe Gloudeman
Vice President—Marketing
MacNeal-Schwendler Corp.
7442 North Figueroa Street
Los Angeles, California 90041
(213) 254-3456
PAFEC 75: PROGRAM FOR AUTOMATIC FINITE ELEMENT CALCULATIONS

Description:
PAFEC 75 is a suite of FORTRAN subroutines capable of solving a wide range of static and dynamic structural problems using the Finite Element method of analysis. Modeling facilities are furnished by a library of over 50 finite elements for use in 1, 2, or 3 dimensions. These range from beams, springs and masses through plates and shells to bricks and wedge elements. Applied loads include gravity, thermal, pressure point load, and centrifugal types. Calculations also include steady state and transient temperature predictions, plasticity, creep, transient responses, and certain cases of large displacement problems. PAFEC 75 has as a part of its standard suite a complete passive graphics capability offering a wide range of finite element structural plot types. In addition to the basic suite, enhancements such as interactive graphics (PIGS), Semi-Loof elements and a lubrication analysis capability are available. Input to PAFEC 75 is one of the simplest yet devised for a large scale finite element program offering complete variability.

Minimum Education Level:
College and University

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
PAFEC Ltd.

Availability:
Contact developer directly:
Alan Austin
PAFEC Ltd.
40 Broadgate
Beeston, Nottingham NG9 2FW
England
SAP6/7: STRUCTURAL ANALYSIS PROGRAMS

Description:

SAP6
The SAP6 program is one of the programs that forms a package of structural analysis programs. The program modules, although independent, interface with each other and the input formats are compatible. The program modules have been established along analytical lines.

SAP6 types of analysis are: static analysis, vibration analysis, buckling analysis, static and dynamic substructuring and dynamic analysis. SAP6 also has some improvements such as: finite element grid generation, intermediate beam loads, AISC-stree check, combination of load cases, and base rotation.

SAP7
SAP7 is a large scale general purpose finite element computer program developed on the basis of SAP4 and NONSAP programs. It may be used for the solution of small and large, linear and nonlinear, static and dynamic structural problems on minicomputers.

The program capabilities include elastic and plastic as well as a number of other nonlinear material models, large deflections, buckling, thermal, stresses, and finally modal and response spectrum dynamic analyses. It can further be interfaced with pre- and post-processor programs for fast and convenient mesh generation and output evaluation.

The current SAP7 element library consists of: 3/d truss, 3/d beam, plane stress and plane strain, axisymmetric, 3/D solid, variable node thick shell, thin plate or thin shell of layered sandwich material, pipe and gap elements. Other features of special interest include band width minimization, restart, capability and free format input which greatly reduces input errors and model generation time.

MODEL
The MODEL program is a preprocessing program used to generate the required data for SAP systems from the minimum of data input. The preprocessing may be used to generate the meshes for any two or three dimensional shape. This includes generating nodal point coordinates, boundary condition, element connections and element properties such as: material thickness, stress tables, material angle, loads, mass weight, and damp. All the two or three dimensional elements
may be generated with any combination. The geometry may be re-numbered to reduce the bandwidth and profile before inputting to a SAP program. The MODEL program also automatically calculates the center of gravity and total mass of the meshes.

POST
POST is a FORTRAN program designed to produce interactive graphic displays of the results of either SAP6 linear or SAP7 nonlinear programs. It can be used for the data checking or presenting the results of a finite element analysis. POST provides a direct communication between user and computer allowing the user to make decisions quickly online. POST is very easy to use as the user is always guided by instructions via storage throughout the operating sequence. Both undeformed and deformed structures can be viewed interactively on any type of graphic terminal such as the Tektronix 4006, 4012, or 4014/15.

TAP6
The TAP6 computer program has been adapted for the SAP Users Group to be used as a preprocessor of SAP6 data files so that combined thermal stress analyses can more easily be accomplished. TAP6 is an advanced version of the Lockheed Thermal Analyzer Program. The basic finite difference concept of solving partial differential equations is a more efficient method, thus saving machine computation time, than the finite element methods. The TAP6 code is a finite difference general purpose thermal analyzer code that is a descendant of the TAP3 computer program and which maintains data deck compatibility with the older program. The TAP6 program provides a basic tool for the solution of second-order partial differential equations.

Minimum Education Level:
College and University

Language:
FORTRAN IV

Operating System:
VAX/VMS

Developed By:
University of Southern California, SAP Users Group — Structural Mechanics Lab
Availability:
Contact developer directly:
SAP Users Group — Structural Mechanics Lab
University of Southern California
University Park — Denney Research #394
Los Angeles, California 90007
(213) 743-5508
SDL

Description:
Utilizing relational database concepts, SDL provides a framework for managing the various types of data associated with simulation projects. Data gathered by observation from the systems under study and data generated by executing simulation models can be stored in a common database using SDL. As a result, efficiency in analyzing and comparing observed system performance with that predicted by a simulation model is significantly improved. In addition, further statistical analyses can be performed without rerunning the simulation models.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
Pritsker and Associates, Inc.
P.O. Box 2413
West Lafayette, IN 47906

Availability:
Contact developer at the above address or telephone: (317) 463-5557.
SDRC FATIGUE

Description:
SDRC FATIGUE, an enhanced "user oriented" software package, can be used to facilitate a crack initiation estimation in mechanical components.

This life estimation software analyzes strain signals from structures such as:

- Mine and farm equipment.
- Process control machinery.
- Hydraulic systems.
- Aerospace equipment.
- Automobiles and trucks.
- Off-highway vehicles.

The capabilities of the enhanced SDRC FATIGUE software package are:

- Reduce the raw time histories to relevant sequential peak/valley information.
- Perform "rainflow" count (number of closed strain cycles for each amplitude range).
- Solve the stress or strain life equation with or without mean stress effects.
- Display life curves for material properties.
- Make cumulative damage summations (Miner's rule).
- Display cycle and damage histograms.
- Print blocks/time to failure.

SDRC FATIGUE is one program in a library of SDRC programs which provides comprehensive experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS, RSX-11M
Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150

Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
SDRC FRAME

Description:
SDRC FRAME is an interactive software package capable of static, dynamic, limit, and buckling analysis of any structure which can be represented by interconnected beams.

The static analysis capability can be used to design efficient structures without sacrificing structural integrity. Once a structure has been modeled by frame element, the program uses the displacement method of matrix structural analysis to solve for deflections, internal forces, internal stresses, and strain energy.

Dynamic analysis helps the user predict structural performance due to time-varying conditions such as transient and harmonic forced response. Modes of vibration, dynamic stresses, and seismic response may also be determined.

Limit analysis allows evaluation of elastic-plastic structural behavior, such as ultimate loading or energy absorption during the collapse of protective structures.

Extensive FRAME modeling capabilities enable a wide variety of structures to be conveniently represented. Complete diagnostics and geometric displays provide fast model debugging. Flexible output display enables results to be readily interpreted.

SDRC FRAME is one program in a library of SDRC programs which provides comprehensive experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150
Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
SDRC IMP

Description:
SDRC IMP is an interactive, three-dimensional mechanisms analysis program for the effective design and development of complex equipment and machinery. Any device which can be thought of as a mechanism can be analyzed by IMP.

Complete analysis capabilities include:
- Kinematics (geometry)
- Statics (equilibrium)
- Dynamics (response and vibration)

The benefits of using IMP include:
- Reduction in development time and cost by automating repetitive design and analysis tasks.
- Evaluation of numerous alternative designs in search of optimum product performance.
- Prediction of product behavior in terms of life and reliability.
- Reduction of costs to manufacturing and prototype construction.

A typical mechanism consists of a number of mechanical parts, generally assumed to be rigid, which are interconnected by joints and springs. This assemblage normally undergoes rapid motion or large changes in its configuration.

The IMP model created by the engineer duplicates the physical mechanism. Once established, this model may be analyzed, altered, and reanalyzed many times in a single session as the engineer optimizes the performance of the mechanism.

SDRC is one program in a library of SDRC programs which provides comprehensive, experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS
Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150

Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
SDRC MODAL-PLUS

Description:
SDRC MODAL-PLUS is an interactive software package used to collect, analyze, and display data from artificial excitation tests. It permits the user to develop, verify, and use a complete mathematical model (a modal database) from a modal test of the structure.

Both total systems and single components can be tested. The results can then be displayed on a large screen so it's easy to see detailed deflections.

The modal database can be used directly to suggest possible hardware modifications to improve products performance. The modal database can also be used in SDRC SABBA or NASTRAN to predict the effects of design changes before hardware is altered.

The unique tri-level command structure and program files of SDRC testing software make it extremely flexible and powerful yet quite friendly to the new user. In fact, by answering simple questions and following the thorough documentation, a new user can get good results quickly, even without the standard introductory two-day training session. For the more experienced user “online documentation” is available via a “HELP” command.

Various levels of support are available from hotline phone support to periodic on-site visits and software updates.

SDRC MODAL-PLUS is one program in a library of SDRC programs which provides comprehensive experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS, RSX-11M

Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150
Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
Application: Engineering

SDRC SABBA
SDRC SABBA is an interactive system analysis software package that reduces the time and cost involved in mechanical design and development. Most importantly, SABBA provides the means for producing higher performance, more reliable mechanical products.

SABBA employs the Building Block Approach to accurately represent complex mechanical systems as either a single component or assembly of components using only a few degrees of freedom. The system natural frequencies and modes are determined together with system performance in its operating environment.

Most commonly, a component or entire system is represented in terms of its natural frequencies and modes of vibration. These may be obtained in two ways.

- Experimentally from modal testing—using SDRC MODAL-PLUS, or
- Analytically from a finite element program such as SDRC SUPERB or NASTRAN.

The system model (or mathematical prototype) can be analyzed to predict its natural frequencies and modes.

SABBA also determines the system response from dynamic loading:
- Sinusoidal
- Random
- Transient

Modification to the model can then be made to predict their effects. By analyzing several design alternatives, the engineer can determine the best design before he builds or alters the hardware prototype.

SDRC SABBA is one program in a library of SDRC programs which provides comprehensive experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS, RSX-11M
Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150

Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
SDRC SUPERB

Description:
SDRC SUPERB is a general purpose finite element program with superior capabilities for analyzing mechanical components and assemblies. It may be used for structures comprised of isotropic and orthotropic materials to perform static and dynamic structural analyses and heat conduction analyses.

The large library of isoparametric and conventional finite elements permits the convenient modeling and efficient analysis of both simple and complex structures.

Interface with SDRC SUPERTAB and data generation capabilities minimize the amount of user-supplied data required to define a SUPERB model. Interactive data checking and graphic display allow quick debugging of models.

SUPERB is designed to be efficient, accurate, and convenient to use. Guyan reduction is employed in normal mode analysis to decrease the size and control of solution. The wavefront solution algorithm and dynamic core allocation permit efficient use of computer central memory.

Extensive output display capabilities facilitate the interpretation of results. Restarts may be performed to analyze new load conditions or combinations of old load conditions as well as to obtain additional post-processing.

SDRC SUPERB is one program in a library of SDRC programs which provides comprehensive experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150
Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
Application: Engineering

SLAM II

Description:
SLAM II is the only available simulation language that supports three modeling viewpoints in a single, integrated framework. It permits discrete event, continuous, and network modeling perspectives, or any combinations of three, to be used in developing simulation models. SLAM II represents a significant breakthrough in simulation language design, as it provides a unique combination of modeling ease and flexibility not found in other languages.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS

Developed by:
Pritsker and Associates, Inc.
P.O. Box 2413
West Lafayette, IN 47806

Availability:
Contact developer at the above address or telephone: (317) 463-5557.
Application: Mathematics

DECIMAL ARITHMETIC PACKAGE

Description:
This package of six programs is designed to teach and drill the student about decimals, including adding and subtracting of decimals. The programs are designed to be run in a particular order although any of them can be run alone for drill.

TERMS: Drill in matching decimals with equivalent fractions and with equivalent terms.
PLCVAL: Drill on identifying the place value of digits in a decimal number.
LINEUP: Drill on lining up three decimal numbers as if they were to be added.
ADDDEC: Drill on lining up three decimal numbers, then adding them.
SUBDEC: Same as ADDDEC, but for subtraction
CMPDEC: Drill on comparing various decimal numbers.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Robert A. Huntsman

Availability:
Contact:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
Application: Mathematics

DELTA EDUCATIONAL COMPUTING SYSTEMS — ADDITIONAL MATHEMATICS PROGRAMS

Description:
Programs included are:

GLPSA1 Two-phase simplex method of linear programming.
TMFCEV Time function evaluation (engineering applications).
CALC Calculator for numbers of up to 100 digits.
CXEXP Raises a complex number to a real or complex power.
GSIMEQ Solves simultaneous linear equations.
CXARTH Performs vector arithmetic operations.
POLY Finds polynomial to approximate a table of x-y data.
POLFIT Performs multiple regression/correlation analysis.
FREQ Finds number of data points (frequency) within limits; data can be in a file or from terminal.
RANDOM Generates random numbers with user-specified sample and population sizes.
ANVAR3 Computes analysis of variance table for a 2-way classification of variables design in which a single observation is made for each combination of levels.
ANVAR4 Computes analysis of variance table for a 2-way classification of variables factorial design with replicated observations.
GANOVA Computes analysis of variance table for a 2-way classification of variables; data is entered cell by cell, down columns.
MULTX Performs a least squares curve fit to one of seven functions; operation is interactive at the terminal.
POLSUB Exercises students in polynomial subtraction operations.
GINTLP  Solves linear programming problems with variables of values 1 and 0.
SIPRAC  Exercises students in mathematical operations on signed numbers.
DE10R   Solves second order differential equations (Runge-Kutta).
DE20R   Solves second order differential equations (Runge-Kutta).
SUNSET  Computes Greenwich Mean Time (or other time) for sunrise and sunset given a particular week and a given latitude and longitude.
WAVES   Plots effects of changing wavelength, amplitude and phase on two waves and their sum.
SPCTRA  Plots optical absorption spectra of two species equilibrium mixtures.
FACTRL Produces any desired factorial and preceding factorials.
SQRZ    Finds the square root of a complex number.
BISQAR  Drill for students on squaring binomials.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

Availability:
DECUS (to members only) and DELTA
Order #RSTS11-47
Application: Mathematics

ELEMENTARY LEVEL INSTRUCTIONAL PACKAGE, VOLUME II

Description:
This series of 10 programs is designed to supplement the elementary or junior high school instruction program, but can also be used for remedial work in high school. The programs not only drill the student in addition, subtraction, multiplication and division, but also have drills on problems such as this: if \( x \times 6 = 48 \), what is \( x = ? \). The programs also include an optional timing feature. The object is to do as many of a given type of problem as possible in the given amount of time. The student who does the most sets the record. Each time the program is run, the record-holder’s name is printed with his record.

SPEEDA  Drill in doing as many simple addition problems as possible in the given amount of time.
SPEEDS  Drill on simple subtraction problems.
SPEEDM  Drill on simple multiplication problems.
SPEEDD  Drill simple division problems.
BOXA  Drill on addition and subtraction problems where the unknown is anywhere in the problem, that is, not always to the right of the equal sign.
BOXM  Drill on multiplication and division problems in the same format as BOXA.
BOX  Drill on all operations in the same format as BOXA.
PROGAS  Drill on simple addition problems involving progressions.
PROGAL  Drill on more difficult addition problems involving progressions.
DBL10  Drill on sets of numbers that add up to a certain number.

Minimum Education Level:
All

Language:
BASIC-PLUS
Operating System:
RSTS-11

Developed By:
Robert A. Huntsman

Availability:
DECUS (to members only)
Order #RSTS11-66 or
Contact:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
Application: Mathematics

ELEMENTARY LEVEL INSTRUCTIONAL PACKAGE, VOLUME III

Description:
This package of 10 programs is a continuation of Vol. I, drilling the elementary student in more specific math skills. There are two programs in the package which can be run only on scope (CRT) terminals. Cursor addressing could be changed so that they would work on any CRT terminal. Another program prints certificates for students, and another utility gives the instructor the ability to modify records as recorded by programs using the "Record" option. The rest of the programs deal with drill in simple math skills, presented in various ways.

ADD3
This is a simpler version of ADDITI in Vol. I, where the student adds a column of three numbers with the first two numbers adding up to 10,100, or 1000.

ELMADD
Drills the student in simple addition facts for a given set of numbers; no timing is included.

ELMSUB
Same as ELMADD, but for subtraction.

ELMMUL
Same as ELMADD, but for multiplication.

ELMDIV
Same as ELMADD, but for division.

MAGIC
Requires the student to complete a magic square of a given size.

CERT
Allows for the printing of a personalized certificate for a student upon completion of a specific task.

KILL
Allows the instructor to delete or list the records held by students for programs using the "Record" option.

MAZGAM
A game where one or two players attempt to work through a maze on a CRT terminal by answering various arithmetic problems correctly.

SCPMAT
Fills the CRT screen with arithmetic problems to be worked by the student.
Minimum Education Level:
1st Grade

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
John Carten

Availability:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
Application: Mathematics

FRACTION PACKAGE

Description:
This package of 12 programs is designed to teach students all the concepts necessary to add, subtract, multiply, and divide fractions. The programs are designed to be run in a sequence. The student must complete the requirements of a given program before he is directed on to the next program. Each program can also be used for drill. The programs offer a choice of easy, medium, or hard problems. No record-keeping is done, but each program prints the student's score when he finishes a session.

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRO</td>
<td>Recognizing factors of a given number.</td>
</tr>
<tr>
<td>GCF</td>
<td>Finding the greatest common factor of two given numbers.</td>
</tr>
<tr>
<td>REDUCE</td>
<td>Reducing fractions to lowest terms.</td>
</tr>
<tr>
<td>FRACAD</td>
<td>Addition of fractions with common denominators and reducing answer.</td>
</tr>
<tr>
<td>IMPROP</td>
<td>Converting fraction from proper to improper form and vice versa.</td>
</tr>
<tr>
<td>LCM</td>
<td>Finding the least common multiple of two given numbers.</td>
</tr>
<tr>
<td>UNRDCE</td>
<td>Converting fractions to equivalent fractions with larger denominators.</td>
</tr>
<tr>
<td>UNDCEN</td>
<td>Adding and subtracting fractions with uncommon denominators.</td>
</tr>
<tr>
<td>FRACMT</td>
<td>Multiplication of fractions, canceling if possible.</td>
</tr>
<tr>
<td>INVRSE</td>
<td>Teaches and drills on inverse of given fractions.</td>
</tr>
<tr>
<td>FRACDV</td>
<td>Division of fractions.</td>
</tr>
<tr>
<td>FINAL</td>
<td>Tests student on problems from all the previous programs in this series. If he passes, it prints a diploma.</td>
</tr>
</tbody>
</table>

Minimum Education Level:
4th Grade

195
Language:
BASIC-PLUS

Developed On:
RSTS-11

Developed By:
Robert A. Huntsman

Availability:
DECUS (to members only)
Order #RSTS11-44 or
Contact:
John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
HUNTINGTON I APPLICATION PROGRAMS — MATHEMATICS

Description:
Twenty programs useful for introducing simple mathematics concepts.

ARITH  Review of multiplication skills. (General Math)

BANK  Solves financial problems concerning installment buying, long-term loans, and savings accounts.

CRVLEN  Computes the length of any curve (analytically defined).

CVAREA  Computes the area under any curve (analytically defined).

GCD  Finds the greatest common divisor of any set of numbers.

LIMSIN  Evaluates the limit of sin x/x as x approaches zero, in both radian and degree measure.

PI2  Computes the area of a circle using both inscribed and circumscribed regular polygons.

PLOTTR  Plots the graph of any function.

PRIFA  Finds prime factors.

QUADRT  Describes the graph of the second-degree equation, $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$.

RATIO  Solves for the unknown in a proportion.

ROOTS2  Finds the real roots of the quadratic equation.

SETS  Finds the union and intersection of any two numerical sets.

SIMEQN  Finds solutions to sets of up to 10 simultaneous equations.

SLOPE  Computes the tangent slope for any function.

SQRT  Finds the square root of counting numbers up to five decimal places.

STATAL  Calculates the arithmetic mean (average) of a set of numbers.
STOCK Simulates the stock market.
SURFAR Computes the area of any surface of revolution.
VOLSOL Finds the volume of solids of revolution.

Minimum Education Level:
Secondary

Language:
BASIC

Operating Systems:
RSTS/E

Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

Published By:
Digital Equipment Corporation

Availability:
Contact developer at the above address.
Application: Mathematics

IMSL LIBRARY

Description:
The IMSL Library is a set of 500 mathematical and statistical subroutines. They are written in FORTRAN and are designed to be used in the development of scientific application programs. The subroutines are organized into the following 17 subgroups or chapters: Analysis of Variance; Basic Statistics; Categorized Data Analysis; Differential Equations, Quadrature, Differentiation Eigensystem Analysis; Forecasting, Econometrics, Time Series, Transform; Generation & Testing of Random Numbers; Interpolation, Approximation, Smoothing; Linear Algebraic Equations; Mathematical & Statistical Special Functions; Non-Parametric Statistics; Observation Structure, Multivariate Statistics; Regression Analysis; Sampling; Utility Functions; Vector, Matrix Arithmetic; Zeros & Extrema; Linear Programming.

An annual subscription entitles the user to the source code on magnetic tape, documentation in both printed and microfiche form, maintenance, updates, and telephone consultation of usage.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
Independent of Operating Systems

Developed By:
IMSL, Inc.

Availability:
IMSL, Inc.
7500 Bellaire Blvd.
6th Floor, NBC Building
Houston, Texas 77036
NAG LIBRARY (NUMERICAL ALGORITHMS GROUP)

Description:
The NAG Library is a tailored collection of 466 subroutines devoted to areas of numerical analysis and statistics such as root finding, Fast Fourier transforms, quadrature, ordinary differential equations, numerical differentiation, integral equations, data fitting, constrained and unconstrained optimization, eigensystems, linear equation solvers, simple statistics, correlation and regression, random number generation, mathematical programming, sorting, special functions and time series analysis.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
RSX-11M, RSTS/E, VAX/VMS

Developed By:
Numerical Algorithms Group Limited
7 Banbury Rd.
OXford OX2, 6NN, England

Availability:
Numerical Algorithms Group Inc.
Attn: Company Secretary
1250 Grace Ct.
Downers Grove, Illinois 60516
(312) 971-2337
**Application: Mathematics**

**PERCENTAGE PACKAGE**

**Description:**
This package is designed to drill and teach the student about percentages. There are programs drilling the student on converting fractions to decimal and decimals to percentages and vice versa. The package also contains a program drilling students on simple word percentage problems.

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHIFT</td>
<td>Drills student on multiplying and dividing numbers by powers of 10 by shifting the decimal point.</td>
</tr>
<tr>
<td>SSHIFT</td>
<td>The student has two minutes to do as many shift problems of 100 as he can.</td>
</tr>
<tr>
<td>FRA100</td>
<td>Drill on converting fractions with denominator of 100 to decimal fractions.</td>
</tr>
<tr>
<td>100DEC</td>
<td>Drill on converting fractions with denominator of 100 to decimal fractions.</td>
</tr>
<tr>
<td>FRADEC</td>
<td>Drill on converting fractions to decimal fractions.</td>
</tr>
<tr>
<td>100PER</td>
<td>Drill on converting fractions with denominator of 100 to percentages.</td>
</tr>
<tr>
<td>DECPER</td>
<td>Drill on converting all types of fractions to percentages.</td>
</tr>
<tr>
<td>ALLPER</td>
<td>Drill on converting all types of fractions to percentages.</td>
</tr>
<tr>
<td>FINDP</td>
<td>Drill on finding a certain percent of a given number.</td>
</tr>
<tr>
<td>GURKIN</td>
<td>Ten percentage word problems from Mr. Gurkin's General Store.</td>
</tr>
</tbody>
</table>

**Minimum Educational Level:**
4th Grade

**Language:**
BASIC-PLUS

**Operating System:**
RSTS-11
Application: Mathematics

RIVERDALE MATH PACKAGE

Description:
The Riverdale Math Package is a set of programs of providing drill and practice in arithmetic. Problems are generated for each student providing individualized drill and are based on previous performance. The curriculum is divided into different topic areas or strands. The performance stage level of each student is differentiated by strands.

The Riverdale Math Package covers a comprehensive arithmetic curriculum in the following strand areas:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Number Concepts
6. Inequalities
7. Fractions
8. Decimals
9. Negative Numbers
10. Exponents and Roots
11. Laws of arithmetic
12. Percents

The Package includes automatic installation programs for all necessary programs to enroll students, drill students in one or all of all applicable strands, and generate reports for teachers. A manager's guide and teacher's manual with complete curriculum description are also included.

Some of the features of the package include:

ENROLL: Setting initial problem difficulty level and setting length of session by minutes and/or number of problems.

REPORT: Short or long student reports with sorting by name, student number or number of sessions.

Minimum Education Level:
Elementary
Language:
BASIC-PLUS

Operating System:
RSTS/E V6C or later.

Developed By:
Michael Fulop and Bruce Alcock
Spence School
New York

Availability:
Contact:
Riverdale Computing, Inc.
5250 Fieldston Road
Riverdale, New York 10471
(212) 549-8044
Application: Mathematics

SIGNED NUMBER ARITHMETIC PACKAGE

Description:
The signed arithmetic package is a set of 15 programs designed to teach the student how to add, subtract, multiply, and divide signed numbers. The package is broken into two groups. The first group of eight programs is used as a tutorial to teach the concepts. The second group of seven programs is used for drill and keeps track of the student who does the most problems in the prescribed amount of time for a given grade. The first group is designed to be run in a sequence. Appropriate messages are printed to help the student learn the concepts.

- SINTRO: Introduction to signed addition and subtraction using a real life story called the postman story.
- SMULT: Introduction of signed multiplication using the postman story.
- ABSOL: Defines and drills student on absolute value.
- SIGNA: Teaches signed addition without the aid of the postman story.
- SIGNS: Same as SIGNA, but for subtraction.
- SIGNM: Same as SIGNA, but for multiplication.
- SIGND: Same as SIGNA, but for division.
- SIGNT: Test on all the concepts learned in the above programs.
- SSPDA: The student has two minutes to do as many addition problems as he can where the unknown is to the right of the equal sign.
- SSPDS: Same as SSPDA, but for subtraction.
- SSPDM: Same as SSPDA, but for multiplication.
- SSPDD: Same as SSPDA, but for division.
- SBOXA: The student has two and a half minutes to do as many addition and subtraction problems as he can where the unknown is anywhere in the problem.
- SBOXM: Same as SBOXA, but for multiplication and division.
Same as SBOXA, but for all signed number operations.

**Minimum Education Level:**
Junior High

**Language:**
BASIC-PLUS

**Developed On:**
RSTS-11

**Developed By:**
Bill Lortz

**Availability:**
Contact John A. Christensen
Idaho Falls School District No. 91
690 John Adams Parkway
Idaho Falls, Idaho 83401
(208) 522-7490
Application: Mathematics

TWODEPEP

Description:
TWODEPEP, Edition Three, is IMSL's latest software package that has many engineering and mathematical applications. It is a small, easy-to-use finite element program that solves a variety of partial differential equations, in general, two-dimensional regions. TWODEPEP (TWO Dimensional Elliptic, Parabolic and Eigenvalue Problems) has a wide range of applications in such areas as heat conduction, fluid dynamics, and more. It solves up to 25 simultaneous equations, has a very efficient out-of-core storage algorithm, employs a special bandwith reduction algorithm that improves on the standard Cuthill-McKee Bandwith, and, most importantly, has TWOPLOT, a graphic output package that plots scalar, vector and stress fields.

Minimum Education Level:
Knowledge of partial differential equations.

Language:
FORTRAN

Operating System:
Independent of Operating Systems

Developed By:
IMSL, Inc.

Availability:
IMSL, Inc.
7500 Bellaire Blvd.
6th Floor, NBC Bldg.
Houston, Texas 77036
DELTA EDUCATIONAL COMPUTING SYSTEMS — ELECTRONICS AND PRODUCTION-ORIENTED PROGRAMS

Description:
Programs include:

ANALAD  Ladder Network Analysis. This program analyzes circuits with alternating series and shunt elements (ladder topology). The circuit can be made of R, L, C networks and lossless transmission lines. The topology of the circuit is restricted, not its size.

The program prints on the user terminal tables or graphs corresponding to the reflection or transmission characteristics of ladder networks. The network to be analyzed is broken into circuits identifiable in a stored catalog.

ACNODE  AC Circuit Analysis. This program computes node voltages by inverting an admittance matrix created from a nodal description of an electronic circuit. Circuit elements allowed include resistors, inductors, transformers, independent current sources, and voltage current sources.

LFPLTR  Design of Low Pass Filters. The program uses constant K prototype T section and M derived \( M = .6 \) termination L section to design low pass filters. The program will give high attenuation at specified frequencies in the stop band by adding up to nine additional M derived T sections.

MICRO  Microwave Parameters Conversion.

MIXSPR  Spurious Response Identification. This program aids in identification of residual responses. It applies the general equation for mixing to each converter and calculates the frequency where the spurious response will occur on the tuning dial. Harmonic numbers and frequencies involved are printed so that filter requirements can be determined.

HTXFT  Heat Transfer in a Thin Plate. This program determines the temperature at each segment in a flat
plate (program uses a two-dimensional array)
where:
1. There is given heat input for each segment (in BTU/HR thermal energy); there is a given thermal resistance in the plate between each segment (in °F-HR)/BTU.
2. There is a given temperature on one side of the plate (in °F).
3. There is a given thermal resistance from each segment to the temperature on the other side of the plate (in °F-HR)/BTU.
4. There is a given thermal resistance from the edge segments to a temperature adjacent to the late and assumed to be the plate and assumed to be the average of the temperatures on either side (in °F-HR)/BTU.
5. The maximum number of segments is 841, determined by a maximum of 29 rows and columns. Special heat inputs may be introduced to any single segment or adjacent segments of a given row and column.

BEMDES Steel Beam Selection. This program recommends the correct steel beam to use for a number of common applications.

DEBYE This program calculates the Debye or Einstein function. Given two of three variables (temperature, specific heat, and theta), the program calculates the third and the normalized energy function at the given temperature.

ASGNMT Assignment Problem. This program solves the classic assignment problem, and determines the cost of implementing the solution.

LINPRO Linear Programming Model. This program finds any or all non-negative \( X = (X(1), \ldots, X(n)) \) which maximize (or minimize) the matrix product \( C^T X \) subject to the condition \( Z^T X = B \), given:

\[
A = (A(i,j)) \\
B = (B(1), \ldots, B(m)) \\
C = (C(1), \ldots, C(n))
\]
C\(^*X\) is called the objective function. The inequalities contained in A\(^*X\) = B are called the linear constraints.

**LNTRND**
Linear Trend Forecasting. This program computes a simple linear trend forecast with seasonal adjustments for monthly data. A good fit results only where the trend is linear.

**LQVALV**
Computes Liquid Control Valve Coefficients.

**TMFCEV**
Time Function Evaluator. The program evaluates time functions with terms of the forms:

\[ A \exp(-Bt) \]

and

\[ (C \cos(Wt) + D \cos(Wt)) \exp(-Gt) \]

with included noise.

**Minimum Education Level:**
College and University

**Language:**
BASIC-PLUS

**Operating System:**
RSTS/E V7.0

**Developed By:**
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

**Availability:**
From Distribution/Developer
Application: Physical Science

FCHART—SOLAR ENERGY ANALYSIS

Description:
FCHART is a program designed to analyze solar energy sources available in our environment.

Weather and location data needed by the program is in the form of five data blocks: CITYDATA, SOLDATIA, DDDATA, TADATA and TEXT. These five data blocks contain city labels and latitudes, monthly long-term average total solar radiation data (horizontal surface), monthly long-term average degree days, monthly long-term average ambient temperatures and format information, respectively. Data is presently available for 266 cities in the United States or Canada.

Minimum Education Level:
Secondary School

Language:
FOTRAN IV

Operating System:
RSTS/E, Version 7.0

Modified for PDP-11 By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
University of Delaware
College of Education
Newark, Delaware 19711

Availability:
Contact developer directly at the above address or telephone: (302) 738-2160.
GENES (GENETIC CALCULATIONS)

Description:
A biology program designed to do simple genetic calculations using
the Punnet square method. Given the total population and the number
of homozygous recessives contained, GENES finds the dominants and
the other parts for the Punnet squares.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Jeffrey Robbins
Northfield-Mount Hermon School
Northfield, Massachusetts

Availability:
DECUS (to members only)
Order #RSTS11-27
GENIE (MENDELIAN GENETICS PACKAGE)

Description:
GENIE is a computer-simulated laboratory in Mendelian genetics. It can simulate a wide range of genetic phenomena including dominance, partial dominance, lethality, linkage, and sex-linkage. As many as three traits may be simulated at any relative map location on the same or different chromosomes. Multiple allele systems may have as many as five alleles and may display any possible combination of dominance and partial dominance. Use of the program is divided into units within which specific phenomena are explored according to instructor specifications.

In the TEST mode, the student is presented with a series of sample populations whose genetic characteristics are determined by instructor-specified templates. The student must diagnose the characteristics by making a series of matings; the program will then check the diagnosis. There is also an EXPERIMENT mode in which the student can define the characteristics of the sample.

GENIE may be used by itself or with the text Mendelian Genetics: A Problem-Solving Approach, written by R. VonBlum, T. M. Hursh, and D. Gillis under the auspices of Project SABLE at the University of California, Berkeley, and published by COMPress, Inc. This self-instructional text is designed to teach Mendelian genetics in such a way as to promote the development of good scientific problem-solving abilities. It covers all of the phenomena which can be simulated by GENIE.

Minimum Educational Level:
College or Advanced Secondary

Language:
BASIC-PLUS

Operating System:
PDP–11/70 Unix; designed for transportability.

Developed By:
Thomas Mercer Hursh
Project SABLE
University of California
Berkeley, California 94709
**Availability:**
Both software and documentation are available from:
COMPRESS, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
HUNTINGTON I SIMULATION PROGRAMS — BIOLOGY

Description:
Seven simulation programs for use in introductory level biology courses.

DROS  A program to determine generic characteristics of the offspring of a pair of Drosophila flies with specified traits. Demonstrates effect of random assortment, probability of phenotypic outcome.

EVOlU  A program to show the relationship between evolution and natural selection by studying a population of mutant moths.

MEMBR  A program simulating membrane characteristics and means of transport of materials across living membranes. Reinforces concepts of diffusion, osmosis, and active transport.

GAMGN  A program to review gametogenesis and to reinforce concepts of random assortment, meiotic divisions, monoploid, and diploid.

NZYMC  A program to demonstrate the dependence of enzymatic reaction rates on environmental factors.

NZYM2  A program to reinforce control of enzyme reaction rates by pH, temperature, and enzyme concentration.

PHOSYN  A program to investigate changes in the rate of photosynthesis when carbon dioxide concentration and light intensity are varied.

Minimum Education Level:
Secondary

Language:
BASIC

Operating Systems:
RSTS/E

Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

215
Availability:

Contact the developer at the above address.
HUNTINGTON I SIMULATION PROGRAMS — CHEMISTRY

Description:
A set of 13 introductory chemistry programs including:

ATWT  "Atomic Weight" — A program to calculate the atomic weight of any element from the percent abundance of each isotope in the element, demonstrating that atomic weight is an average weight and not the weight of any particular atom.

AVOGA  "Avogadro's Number" — A program to calculate the value of Avogadro's Number, and to reinforce the concept of Avogadro’s hypothesis.

DECAY1  "Radioactive Decay" — A program to teach the concept of half-life, exponential decay, and radioactivity.

DECAY2  "Nuclear Decay" — A program to calculate half-life and mass, and to print out a table showing mass or number of particles of a radioactive sample.

EMPIR  "Empirical Formulae" — A program to demonstrate the difference between molecular and empirical formulae, the law of multiple proportions, and the importance of accurate calculation.

EQUIL1  "Equilibrium" — A program to demonstrate the dynamic nature of an equilibrium system, the significance of equilibrium constants, and an exercise in the interpretation of experimental data.

EQUIL2  

KINET  "Kinetics" — A program to tabulate and grade equilibrium concentration data.

MASSD  "Mass Defect" — A program to calculate and explain mass defect, to introduce the concept of binding energy, and to demonstrate the conversion of mass to energy (atomic power).

MOLAR  "Acid-Base Titration" — A program to calculate molarity based on data obtained from an acid-base titration.
PHPOH  A program to calculate pH, pOH, and percent dissociation of weak monoprotic acids, using the quadratic equation for rigorous solutions.

PRCNT  "Percent Composition" — A program to demonstrate the Laws of Multiple and Definite Proportions through the calculation of the percent composition (by weight of a compound containing up to five elements).

STOICH  "Stoichiometry" — A program to solve mass-mass, mass-volume, and volume-volume problems.

Minimum Education Level:
Secondary

Language:
BASIC

Operating System:
RSTS/E

Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

Availability:
Contact the developer at the above address.
Application: Physical Science

HUNTINGTON I SIMULATION PROGRAMS — EARTH SCIENCE

Description:
Four programs to introduce students to a variety of concepts in earth science.

CLOUDS
A program to test students' ability to solve problems related to the formation of cumulus clouds.

WATER1
A program to guide students in calculations of a water budget, considering moisture patterns of usage, storage, recharge, and deficit.

WATER2
A program to give students practice in identifying climate and climatic patterns by graphing and interpreting data.

CLIMAT
A program to give students practice in identifying climate and climatic patterns by graphing and interpreting data.

Minimum Education Level:
Secondary

Language:
BASIC

Operating Systems:
RSTS/E

Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

Availability:
Contact the developer at the above address.
HUNTINGTON I SIMULATION PROGRAMS — PHYSICS

Description:
Twenty-one BASIC programs to be used in introductory physics courses.

BFIELD A plot routine illustrating the B field about one- and two-wire currents. (Electricity and Magnetism)

BOHR Hydrogen line spectrum and energy level diagrams displayed. (Atomic and Nuclear)

CALORI Calorimetry experiment to determine the heat energy to be supplied (or removed) from each mass to obtain equilibrium temperature. (Mechanics)

DECAY1 Radioactive decay treated qualitatively in a game-type situation.

DECAY2 Calculates half-life and mass, and prints a table showing mass or number of particles of a radioactive sample.

EFIELD Finds the relative field strength at a given distance from a line and plane of charge. (Electricity and Magnetism)

KINERV Review of kinematics: presents questions concerning the movement of a ball in flight. (Mechanics)

LENSES Solves lens problems. (Light and Waves)

MASSD Calculates mass defect.

NEWTN2 A problematic situation requiring repeated application of Newton's Second Law. (Mechanics)

PHOTEL Critical wavelength for photoelectric emission determined in a simulated experiment. (Atomic and Nuclear)

PHOTON Energy levels determined from the emissions of excited atoms. (Atomic and Nuclear)

PLANK A photoelectric simulation. Students adjust retarding potential to determine the wavelength of randomly selected electron-emitting X-rays. (Atomic and Nuclear)
PRJTL Coordinates and speeds printed for a projectile fired at selected speeds and angles (frictionless). (Mechanics)

REFLCT Least time principle of light presented as a challenge involving a game analogy. (Light and Waves)

SLITS A plot routine permitting exploration of Young's double-slit experiment. (Light and Waves)

SNELL A plot routine to aid in visualizing Snell's Law. (Light and Waves)

VFIELD Plots a picture of the relative potential strength in the region surrounding two charges. (Electricity and Magnetism)

VLOCTY Demonstrates that average velocity (D/T) approaches a limiting value as T \rightarrow 0. A graph of D vs. T is plotted for an acceleration of one meter/sec². (Mechanics)

WAVES Plots a graph of a fixed and a variable wave, and the superposition of the waves. (Light and Waves)

Minimum Education Level:
Secondary

Language:
BASIC

Operating System:
RSTS/E

Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

Availability:
Contact the developer at the above address.
Application: Physical Science

ILS—INTERACTIVE LABORATORY SYSTEM

Description:
ILS is a comprehensive set of FORTRAN programs used to investigate signals and their properties. These can be signals such as EKG traces, heart sounds, sonar signals, speech sounds, seismic pressure waves, radar reflections, etc.

The software handles both real and complex data and supports functions such as: addition, multiplication, magnitude, hard and soft limiting, phase wrapping and unwrapping, FFT and inverse FFT, autocorrelation, crosscorrelation, convolution, spectral density, coherence, and moving or exponential averaging to reduce the variance of the estimates. The ILS programs allow data scanning and manipulation, digital filtering, signal modeling (parameter estimation), spectral and cepstral analysis, plus pattern analysis/recognition. The software operates in an interactive or batch mode and makes extensive use of graphics.

ILS contains a standard set of file structures including sampled data files, analysis files, record files, and label files, which in combination allow for very efficient storage and access of numerous data types. The file conventions allow for convenient information transfer from one program to the next, and enhance the portability of data and programs among installations.

ILS allows for numerous graphical operations such as scaled data displays, multiple calibrated data displays with user-defined grid options, scatter plots with principal component analysis options, and 3-D displays of spectra, log spectra, and spectral models.

ILS has been installed worldwide in industrial, university, governmental, and research organizations. ILS is delivered in source form along with the necessary command or batch files to compile and link the system. Documentation consists of a Users Guide, (which documents the programs), a Programmers Guide (which documents frequently used subroutines), a Training Manual and an Installation Manual. The first year of maintenance is included in the price.

Minimum Education Level:
B.S. Degree

Language:
FORTRAN
Operating System:
VAX/VMS, RSX-11M, RSX-11D, UNIX

Developed By:
Signal Technology, Inc.
15 West De La Guerra St.
Santa Barbara, CA 93101

Availability:
Contact developer directly at the above address or telephone: (800) 235-5787, (805) 963-1552.
NMRSIM: NUCLEAR MAGNETIC RESONANCE SIMULATION

Description:
Especially designed for a timesharing environment, NMRSIM simulates nmr spectra using hypothesized values of coupling constants, chemical shifts, rf power, and relaxation times. Fifteen operational modules in three source program segments interact dynamically, requesting parameters in a natural order, computing and plotting spectra for up to six spin-1/2 nuclei (or fewer with larger spins), permitting revisions of parameters with minimal repetition and protecting against erroneous keyboard entries. Line spectrum files can be computed at any terminal and stored on disk for later plotting with the program. The plotting subroutines, which give full control over scaling of the plot with only four input numbers, support the Tektronix 4010 graphics terminal, the TSP-12 or TSP-212 plotting systems, and the HP 7200A/7202A graphic plotters.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
James S. Evans
Lawrence University
Appleton, Wisconsin

Availability:
DECUS (to members only)
Order #RSTS11-64
DECUS #10-221 is a similar program written in PDP-10 FORTRAN.
Application: Physical Science

NORTON (ASTRONOMICAL EPHEMERIS PROGRAM PACKAGE)

Description:
NORTON is a RSTS BASIC-PLUS package which gives planet and asteroid positions for any date from January 1, 1900 to the present. Specific possible operations include:

- Julian Date
- Siderial Time
- Velocity
- Orbital Longitude
- Solar Distance
- Declination
- Orbital Elements
- Constellation
- Elongation
- Geocentric Distance
- Right Ascension
- Hour Angle
- Attitude & Azimuth
- Obliquity of Ecliptic

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Warren A. Leach
OMSI Community Research Center
Portland, Oregon

Availability:
DECUS (to members only)
Order #RSTS11-63
PHYSCHEM PROGRAMS (INTRODUCTORY PHYSICS AND CHEMISTRY)

Description:
PHYSCHEM programs are a series of computer programs designed to enable instructors to provide their students with the opportunity to review the important concepts of introductory physics and chemistry.

PHYSCHEM offers three types of programs in the series:

I. Computer-Assisted Instruction Programs — designed to guide the student through a series of quantitative questions; the student interacts with the computer and receives immediate evaluation of his responses and/or assistance if and when needed. Each time a program is run, a different set of numerical data is generated and, in most instances, an entirely new problem is presented.

II. Individualized-Instruction Programs — generates a unique set of problems for each student. The answers can be provided so that the student can check his own work, or the computer can store the correct answers so that after the student has completed his work away from the terminal, he can feed his answers into a generalized utility program, ANSI, which grades his performance. These I/I programs are ideal for generating exams and homework assignments on an individualized basis.

III. Utility Programs — designed to provide solutions to time-consuming problems often given on exams and homework assignments. Problems in calorimetry, stoichiometry, projectile motion, vector analysis, etc., require tedious computation, and these utility programs are intended to free teachers from the time required to obtain the correct solutions. Students may also be permitted access to these programs in order to check their own work.

The programs cover the following concepts:

Linear Kinematics
Projectile Motion
Momentum and Energy
Energy & the Inclined Plane
Inelastic Collisions
Centripetal Force Analysis
Pulley Systems
Calorimetry
Specific Heat Capacity
Heats of Fusion/Vaporization
Specific Gas Laws
General Gas Law
Thermodynamics I
Thermodynamics II
Transverse Standing Waves
Longitudinal Standing Waves
Lenses and Mirrors
Reflection/Refraction
Series Circuit Analysis
Parallel Circuit Analysis
Series/Parallel Circuit Analysis
Faraday’s Law
Gram-Molecular Mass
The Mole Concept
Molarity Concept
Normality Concept
Molality Concept
Stoichiometry: Mass/Mass
Stoichiometry: Mass/Volume
Stoichiometry: Volume/Volume
Stoichiometry: General
Percent Composition
pH Concept
EMF of Cells
Electric Field Analysis
Photoelectric Effect
Symbols and Valences Drill
Naming Compounds Drill
Formulas of Compounds Drill
Vector Analysis I
Vector Analysis II
Gas Law Analysis
Optics Analysis
Projectile Analysis
Calorimetry Analysis
Chemistry I Analysis
Chemistry II Analysis
Stoichiometry Analysis
Percent Composition Analysis
Equation Balancer

Minimum Education Level:
Secondary
Language:
BASIC (Data files have been eliminated to make programs compatible with all popular versions of BASIC.)

Operating System:
Independent

Developed By:
PHYSCHEM Programs
2048 Ford Street
Brooklyn, New York 11229

Availability:
Contact developer directly.
Application: Physical Science

PHYSICS TUTORIAL PACKAGE

Description:
This package comprises 50 linear tutorial programs covering problems in mechanics, electricity, and magnetism. The programs are designed to accompany Physics Problem Workbook by John L. Jones. (Student and instructor manuals were developed under the auspices of Project COMPUTe at Dartmouth College and are published by COMPress, Inc.)

The workbooks present a description, objectives, and diagram for each of the 50 problems presented in the programs. Also provided with the package are:
1. a program for generating data files for these or for new problems;
2. a driver program which uses these files;
3. a model for altering the problems to allow for variable data each time a program is repeated;
4. a model for using a record file to collect question and problem numbers, responses, and response time for various purposes of the instructor.

Minimum Educational Level:
College or Advanced Secondary

Language:
BASIC

Operating System:
Independent; designed for transportability.

Developed By:
John L. Jones
Department of Computer Science
United States Naval Academy

Availability:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
SPPLT (HYBRID ORBITAL CONTOUR PLOTTING PROGRAM)

Description:
Especially designed for a timesharing environment, SPPLT prepares accurate contour plots of hybrid atomic orbitals with specified contour levels, effective nuclear charge, amounts of 2s and 2p character, and geometric operations (scaling, translation, rotation). After plotting, the user can replot the same orbital with different scaling parameters, or perform calculations for a different orbital shape. The plotting subroutines support the Tektronix 4010 graphics terminal, the TSP-12 or TSP-212 plotting systems, and the HP 7200A/7202A graphic plotters.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Stephen L. Holmgren, James S. Evans
Lawrence University
Appleton, Wisconsin

Availability:
DECUS (to members only)
Order #RSTS11-65
DECUS #10-212 is an equivalent program written in PDP-10 BASIC, Version 17.
SPRING THING (WAVE MOTION SIMULATION)

Description:
This program simulates the action of waves on a coil spring. The program accurately simulates the following conditions:
1. The passing of two waves, reinforcing or cancelling as the case may be, but returning to their original shape after passing.
2. The reflection of a wave off a wall.
3. The movement of a wave from a heavy to a light density spring.
4. The movement of a wave from a light to a heavy density spring.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Clark M. Baker
DSAA: Project DELTA
University of Delaware
Newark, Delaware

Availability:
DECUS (to members only)
Order #RSTS11-37
SURVEY SAMPLING PACKAGE

Description:
This package of nine programs is designed to be an integral part of the text *Survey Sampling in the Environmental Sciences: a Computer Approach*, by James P. Barrett and Mary E. Nutt. The student text was developed under the auspices of Project COMPUTe at Dartmouth College and is published by COMPress, Inc. The programs are used as an approach to the theory, planning, and application of sampling in the environmental sciences and cover five basic sampling methods (simple random, systematic, stratified, cluster, and regression estimation). The package can be used in survey planning to investigate the interaction of precision and cost for different sampling strategies.

Minimum Education Level:
College

Language:
BASIC

Operating System:
Independent; designed for transportability

Developed By:
James P. Barrett
Institute of Natural and Environmental Resources
University of New Hampshire

Mary E. Nutt
formerly Dept. of Zoology
University of New Hampshire

Availability:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
Application: Social Science

BASIC APPLICATION PROGRAMS — BUSINESS/SOCIAL STUDIES

Description:
A booklet containing a series of BASIC programs for use in business and social studies curricula. Social studies programs include:

POPULATION
A program to study comparative population growth, using the United States and Mexico.

SMOG
A simulation of smog generation by automobiles, and the effect of varied atmospheric conditions on this generation.

Minimum Education Level:
Secondary

Language:
BASIC

Operating System:
RSTS/E

Developed By:
Digital Equipment Corporation
Education Computer Systems Group
Media Response Manager—PK3-2/M94
129 Parker Street
Maynard, Massachusetts 01754

Availability:
Contact the developer at the above address.
COGNITIVE PSYCHOLOGY LABORATORY

Description:
This package of seven programs provides a laboratory introduction to cognitive psychology through a series of six experiments. In each experiment, the computer presents a task to the student and to a simulation of a model of human information processing relevant to that task. The student is asked to compare his performance with that of the model and to compare what he thinks he did with what the model says he did. The simulations are designed so that features of the task and the model can be changed by the student, allowing him to run his own experiments on the model or on other humans. Questions are asked at the end of each experiment which lead the student to conduct such experiments. The six experiments were chosen to cover the range of cognitive activity represented in the current general conception of the human information processing system.

The programs accompany the text *Cognitive Psychology: A Computer Oriented Laboratory Manual*, by William L. Bewley. Both student and teacher's manual were developed under the auspices of Project COMPUTe at Dartmouth College and are published by COMPress, Inc.

Experiment 1. Pattern Recognition  
Task: visual search  
Model: pandemonium (Selfridge, 1959)

Experiment 2. Short-term Memory  
Task: continuous memory  
Model: buffer model (Atkinson & Shiffrin, 1968)

Experiment 3. Long-term Memory  
Task: paired-associate learning  
Model: discrimination net (Hintzman, 1968)

Experiment 4. Concept Learning  
Task: Blank trials task of Levine (1966)  
Model: several—sampling with replacement, local consistency, consistency check, focusing

Experiment 5. Decision Making  
Task: two-person game  
Model: a combination of the social motives of Messick & McClintock (1968) and the lin-
Experiment 6. Problem Solving
Task: missionary and cannibals problem
Model: The General Problem Solver (Ernst & Newell, 1969)

Minimum Educational Level:
College

Language:
BASIC

Operating System:
RSTS-11

Developed By:
William L. Bewley
Xerox Corporation
(formerly Lawrence University)

Availability:
Both software and documentation available from:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
Application: Social Science

DEMO-GRAHICS (COMPUTER-ASSISTED INSTRUCTION IN POPULATION)

Description:
The purpose of this project is to develop and disseminate, to institutions of higher education, multipurpose computer-based instructional programs for the teaching of population and population-related issues, such as Population and Food, and Population and Economic Development. This objective is designed to fill a recognized need for the development of techniques to communicate the impact of population change on social trends by utilizing the latest developments in computer technology. The program consists of a flexible interactive educational system which can be adapted and implemented on a large number of computer systems including personal computers [graphics, terminals, Teletype, slide output, hardcopy output] throughout the nation as well as a number of countries throughout the world.

A number of different simulation models are now available for distribution:

1. Population Projections
2. Population History
4. International Migration
5. Two-Sex Population Projections

A database of 145 countries is included with the DEMO-GRAHICS programs: all data may be retrieved for each country through the use of the Database Query program. Up to 10 additional countries or regions (blocs of existing countries, cities, subpopulations, etc.) may be added to the database by a program user; the procedure for adding new data is contained in three special programs which are included in the DEMO-GRAHICS program package.

At present this program is being used in over 150 different colleges, universities and other educational institutions for enhancing population-related education in undergraduate and graduate education as well as special high school programs.

The mode of information transfer is primarily through the use of computer generated graphics and also includes the use of other types of visual materials, such as slides, transparencies, and booklets derived from the computer-generated graphics. In addition, user manuals, teachers' guides and other printed materials are also available. The
programs are now running on a number of computer systems and are almost machine independent, thus enabling wide use.

The program has been used in over 16 different disciplines. They are:

Agricultural Economics
Anthropology
Biology
Computer Science
Economics
Education
Environmental Science
Geography
History
International Studies
Mathematics
Political Science Psychology
Public Health
Social Science
Sociology

Minimum Education Level:
College and University, some selected high schools

Language:
BASIC

Operating System:
Independent, designed for transportability.

Developed By:
Population Dynamics Group
University of Illinois
57 Coordinated Science Laboratory
1101 W. Springfield Avenue
Urbana, Illinois 61801

Availability:
Contact Professor Paul Handler, Director, at above address or call (217) 333-3827.
Application: Social Science

DEPRESS

Description:
DEPRESS is an adaptation of Dartmouth College's IMPRESS (Interdisciplinary Machine Process for Research and Education in the Social Sciences).

A selective retrieval and analysis system for large data files in the social sciences, DEPRESS allows researchers to solve empirical questions by cross tallies on a database. It permits simple statistical analyses including frequencies, chi-square percentages across, down, and on the total.

DEPRESS provides a means for students to solve and test empirical research problems on their own, rather than through memorization.

DELTA Educational Computing Systems has developed a DEPRESS "data library" containing a variety of studies available on request. These include:

PRES52   A sample taken from the National Consortium database for the 1952 Presidential Election Study. Includes data on the 1952 presidential vote, interest in the campaigns, social classes, and standard background items.


PRES68   Another sample of U.S. adults taken from October to the beginning of November, 1968. Contains detailed data on civil rights, Vietnam, campaigns, and standard background items.

COURT    A study of 92 supreme court justices up to and including Potter C. Stewart. The study is concerned with party identification, religion, ethnic background, and other personal historic variables on the justices.

Minimum Education Level:
College and University

Language:
BASIC-PLUS
Operating System:
RSTS/E V7.0

Developed By:
Clark M. Baker
Edward R. Baker
Deborah A. Persoleo

Availability:
Contact developer directly:
DSAA: Project DELTA
Room 360, DuPont Hall
University of Delaware
Newark, Delaware 19711
(302) 738-2704
Application: Social Science

ECPRESS

Description:
ECPRESS is functionally equivalent to DEPRESS, except that it runs under RSTS/E and includes additional analytic procedures, specifically, marginal frequencies and multiple correlation coefficients.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEM
University of Delaware

Availability:
Contact developer directly at the following address:
College of Education
University of Delaware
Newark, Delaware 19711
(302) 738-2160
Application: Social Science

HUNTINGTON I SIMULATION PROGRAMS — SOCIAL STUDIES

Description:
A booklet containing a variety of BASIC simulation programs for use in social studies. Programs include:

BALANC   A program to demonstrate the distinction between "balance of trade" and "balance of payments," as well as the components that make up the "balance of payments" and their individual impacts.

BANK     A program to aid students in learning terms used in financial problems involving installment buying, long-term loans, and savings accounts. Emphasis on the mathematical logic behind the solution of financial problems.

CIRFLW   "Circular Flow Between Business and Consumer" — A simulation of the circular flow of goods, services, and money between business and the consumer in a free enterprise economy without government control.

CONSMP   "Depression/Equilibrium" — A simulation to demonstrate: a) depression or recession results when consumption drops below the capacity to produce; b) equilibrium results when consumption equals the capacity to produce; and c) how a time-lag in discovering a drop in consumption can cause over-production.

STOCK    A simulation of stock market activities to aid the student in developing an understanding of its operations.

Minimum Education Level:
Secondary

Language:
BASIC

Operating System:
RSTS/E
Developed By:
Huntington Computer Project
State University of New York
Stonybrook, New York

Availability:
Contact the developer at the above address.
OPTIMAL LOCATION OF FACILITIES

Description:
Intended for use in undergraduate classes in economic and social geography, urban and regional planning, and spatial analysis, this package of programs provides computational methods for solving problems concerning the optimal location of facilities, especially service facilities. The package handles the following types of problems: 1) locating single and multiple facilities to minimize the average distance separating facilities from locationally dispersed and differentially weighted demand points; 2) minimizing the maximum distance to the farthest demand point; 3) minimizing the total distance subject to a maximum distance constraint; and 4) finding the minimum number of facilities required for every demand point to be within a specified distance of a facility.

Designed for use with the text entitled *Optimal Location of Facilities*, written by Gerard Rushton under the auspices of Project COMPUTe at Dartmouth College, and published by COMPress, Inc.

ALLOC Heuristic solutions to multifacility location problems on a graph

ALTERN Heuristic solution to the M-center location allocation problem

INTPMED Evaluation of student solutions to location problems on a network

SPA A shortest path algorithm

TORN Heuristic solution to the M-center location-allocation problem

Minimum Educational Level:
College

Language:
FORTTRAN

Operating System:
Independent; designed for transportability.

Developed By:
G. Rushton
M.F. Goodchild

243
L.M. Ostresh Jr., and others
Department of Geography
University of Iowa

Availability:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
Application: Social Science

POPGROW: POPULATION GROWTH PACKAGE

Description
POPGROW is a computer-simulated laboratory in population growth. It is based on a simple algebraic model of population growth which is ideal for the instruction of beginning students of biology, ecology, and related fields such as wildlife management. The approach is particularly appropriate for those who will go on to practical problems and computer modeling. The program is used in a sequence of four units—exponential growth, density-dependent growth, variations in carrying capacity, and delays in regulatory response. While the model is simple, easy to manipulate, and closely tied to underlying biology, the patterns of growth which can be simulated are quite complex. The program is designed to encourage systematic exploration of each biological factor.

POPGROW may be used by itself or with the text Population Growth: A Problem-solving Approach written by D. Southworth and T.M. Hursh under the auspices of Project SABLE at the University of California, Berkeley, and published by COMPress, Inc. This self-instructional text is designed to introduce students to the scientific diagnosis of problems in population dynamics. It covers the topics simulated by POPGROW plus immigration, emigration, and age structure.

Minimum Education Level:
College or Advanced Secondary

Language:
BASIC-PLUS

Operating System:
PDP-11/70 Unix; designed for transportability.

Developed By:
Thomas Mercer Hursh
Project SABLE
University of California
Berkeley, California 94709

Availability:
Both software and documentation available from:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
PSYCHOLOGICAL STATISTICS

Description:
This is a package of 15 programs which accompany the classroom text *Introductory Psychological Statistics: A Computer Approach*, by Janet Price. Developed under the auspices of Project COMPUTE at Dartmouth College, the student and instructor texts are published by COMPRESS, Inc.

The programs are all extremely simple in order to maximize the likelihood that students will be able to understand them simply by reading them line by line. Computational requirements are modest. The programs include:

IPS3.1 Computes first three moments about zero from an unordered set of numbers.

IPS3.2 Computes first three moments about zero from a frequency distribution.

IPS3.3 Computes first three moments about mean from an unordered set of numbers.

IPS3.5 Computes first three moments about zero and the first three moments about mean from a frequency distribution.

IPS5.2 Generates rectangularly distributed random numbers between 0 and 1.

IPS5.3 Generates rectangularly distributed random numbers between 0 and 10.

IPS5.4 Generates samples of random numbers between 0 and 10; computes mean and standard deviation of each sample, of sample means, and of sample standard deviations.

IPS7.4 Computes mean and standard deviation (biased and unbiased) of a set of unordered data.

IPS8.11 Computes correlation between two variables.

IPS9.7 Computes correlation of X and Y, regression of Y on X, predicted Ys and residuals.

IPS11.1 Computes between-groups and within-group sums of squares.
GUESS-C Generates sets of pairs of numbers and prints a scatter diagram of them; designed to give practice in estimating size and significance of correlations.

GUESS-D Designed to give practice in acting as scientific decision maker. Generates random samples and prints frequency distribution from either ND(100,?) or some other distribution. Student is told costs of making Type I and Type II errors and asked the distribution from which each sample comes.

GUESS-M Designed to give practice in estimating mean, standard deviation, and skewness. Generates different random distributions of numbers and plots them in form of frequency polygons. In response to student’s estimates, program prints actual value of the statistic and the percent error. At end of session, student is given statistical summary of performance.

GUESS-P Designed to give practice in estimating likelihood of obtaining samples with means higher or lower than that for the sample given. Based on random samples from a normal distribution.

Minimum Education Level:
College

Language:
BASIC

Operating System:
Independent; designed for transportability.

Developed By:
Janet Price
Department of Psychology
Knox College

Availability:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282

247
SPSS: STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

Description:
SPSS is a comprehensive, integrated system of powerful yet flexible and easy-to-use procedures for statistical analysis, tabulation, report writing, and general purpose data management. Absolutely no programming experience is needed to use the system: control statements are in English syntax and output is both logically formatted and fully labeled. SPSS documentation, distributed worldwide by the McGraw-Hill Book Company, is so complete and readable that the manual is often used as an introductory statistics text and over 300,000 copies have been sold.

Extensive data management facilities permit simplified handling of large file and subfile structures as well as recoding of existing variables, creation of new variables, and selection, sampling, or weighting of specific cases. The powerful new report generator can list cases, compute a wide range of summary statistics, and produce customized, camera-ready output.

Versions of SPSS are available for both the PDP-11 and VAX-11/780. Statistical capabilities include the following (not all capabilities available on both versions): Frequency Distributions—Tabulation or graphic display along with any of 13 different distributional statistics; T-TESTS—independent and paired samples; BREAKDOWN of aggregate data into subpopulations with one-way analysis of variance; AGGREGATION of subpopulations; N-WAY CROSSTABULATION — fully labeled, three types of cell percents and 21 measures of association; MULTIPLE RESPONSE—frequency distributions and crosstabulations; CORRELATION—Pearson's R with significance levels and SCATTERGRAM; PARTIAL CORRELATION; NONPARAMETRIC CORRELATION—Spearman, Kendall; MULTIPLE REGRESSION—stepwise selection, forward inclusion, backward elimination, and forced entry or removal with plotting capabilities and residual analysis; N-WAY ANALYSIS OF VARIANCE AND COVARIANCE—with MCA tables; DISCRIMINANT ANALYSIS—direct and various stepwise solution methods; FACTOR ANALYSIS—five methods, four rotational solutions with plotting; CANONICAL CORRELATION ANALYSIS; RELIABILITY—analysis of repeated measures and scales; LIFE TABLE—analysis and graphs of survival functions; NONPARAMETRIC TESTING—14 tests; GUTTMAN SCALE ANALYSIS.
Minimum Education Level:
College and University (plus Elementary and Secondary Administration)

Language:
FORTRAN with some Assembler

Operating Systems:
RSTS/E and VAX/VMS

Developed By:
SPSS/Minicomputer Version  SPSS/VMS Version
Carleton College  Holy Cross College
Northfield, Minnesota  Worcester, Massachusetts

Availability:
SPSS, Inc.
444 North Michigan Ave.
Suite 3300
Chicago, Illinois 60611
(312) 329-2400
Contact: Suzanne Weiss, Marketing Manager
Application: Social Science

WRIST: WABASH RESEARCH INVESTIGATION SIMULATION
TEACHER

Description:
This program package, which simulates an assortment of psychology
experiments, has been translated into BASIC-PLUS from the Louisville Experiment Simulation System (LESS) by Arthur O. Cromer, et al.
One model has been added to the original six and a backup file has
been incorporated for results so that the user may work on a CRT.
There are two categories of programs: the models, which are used by
students in simulated laboratory exercises, and the maintenance pro-
grams, which allow the instructor to construct and alter models.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Philip R. Spelt and James A. Warden
Wabash College
Crawfordsville, Indiana

Availability:
DECUS (to members only)
Order #RSTS11-70
BMDP RELEASE 2.1 (PDP-11 VERSION)

Description:

The latest version of BMDP also increases array space by up to 20% over earlier PDP-11 versions, allowing them to perform larger tasks such as increasing the number of variables in a regression, the vendor claimed.

Thirty-Seven Programs

It also contains an interactive program, POIF, that can perform contingency analysis or study the relationship between two variables.

A line-oriented editor is now included in each program, allowing them to run in a semi-interactive fashion at a terminal without the need for a system text editor.

Other enhancements include a new method of specifying data transformations, recoding of alphanumeric data on input and extensions to the syntax of the control language used for specifying analyses.

Minimum Education Level:
College Level Statistics

Language:
FORTRAN

Operating System:
RSTS/E, RSX-11

Developed By:
Software Development, Inc.

Availability:
BMDP Release 2.1 is available from:
Software Development, Inc.
Application: Statistics

BMDP (VAX-11/780 VERSION)

Description:
The 1981 release of BMDP consists of 44 separate programs which share common control language, data editing and transformation procedures, allowing data and results to be passed from program to program. This release also features extensive modifications to facilitate interactive usage and now includes two Time Series analysis programs: Box-Jenkins and Spectral Analysis. The general procedures available are:

- Data Description, Screening and Missing Data Estimations
- Cross-Tabulation and Plotting
- Regression multiple, stepwise, logistic, non-linear, all subsets, principal components)
- Analysis of Variance and T-testing
- Cluster Analysis and Factor Analysis
- Life Table and Survival Functions

Users receive source, object, and executable programs, plus several DCL procedures to assist with building the system and varied program applications.

Minimum Education Level:
College or University

Language:
FORTRAN

Operating System:
VAX/VMS Version 2

Developed By:
UCLA
Bio Mathematics Department

Availability:
Bernard Ryan
Management Science Associates Inc.
5100 Center Ave.
Pittsburgh, PA 15232
(412) 683-9533
Application: Statistics

CADA MONITOR—COMPUTER-ASSISTED DATA ANALYSIS

Description:
The CADA Monitor is a conversational-language, interactive computer statistical package with a Bayesian, decision-theoretic orientation. Leading a user step-by-step through a data analysis, CADA's first function is to teach modern statistical methods to students with minimal mathematical backgrounds. CADA's second function is to provide educational administrators and researchers with easily used, yet sophisticated methods of exploring data sets, assessing utilities and prior probabilities, obtaining posterior probabilities, and combining these probabilities and utilities in order to produce coherent and effective decisions.

The Monitor is hierarchically structured and highly modularized. Because of this structuring, its memory requirements are modest. The nine major classifications of analyses are as follows:

1. Data Management Facility
2. Simple Bayesian Parametric Models
3. Decision Theoretic Models
4. Bayesian Simultaneous Estimation
5. Bayesian Full-Rank Analysis of Variance
6. Bayesian Full-Rank Multivariate Analysis
7. Elementary Classical Statistics
8. Exploratory Data Analysis
9. Probability Distributions

Because CADA presents a great deal of information, it is recommended at terminal speeds of at least 1200 baud.

*Development of the CADA Monitor was supported in part by National Science Foundation Grant #SED80-06357 to The University of Iowa, Melvin R. Novick, Principal Investigator.

Minimum Education Level:
College

Language:
BASIC-PLUS, VAX-11 BASIC

Operating System:
RSTS/E and VAX/VMS
(Matrix enhancements to MU-BASIC available with CADA are required.)
Developed By:
The CADA Research Group
The University of Iowa
348 Lindquist Center for Measurement
Iowa City, IOWA 52242

Availability:
Contact developer directly: (319) 353-6707.
CASANOVA PACKAGE

Description:
CASANOVA is a package of programs and text files designed to provide Computer ASsisted instruction in ANalysis Of VAriance. It concentrates on teaching the computation involved in a variety of ANOVAs without confining the instructor to a particular orientation or text. Its usefulness rests on the assumption that performing ANOVA computations with the aid of the computer will contribute to under the computations quickly, and provides feedback to partial solutions in order to monitor the student's performance. CASANOVA users should have had some introductory study of statistical inference, hypothesis testing, and one-way ANOVA prior to using the package. The package consists of 21 BASIC-PLUS programs and 18 virtual core files containing text of instructions and help messages for users of the package. Documentation consists of a Student’s Manual and an Instructor's Manual.

Restrictions: The package requires about 500 blocks of disk space for its own source and text files, and additional (variable) space for users.

Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS or RSTS/E Version 4A or later

Developed By:
Francis Campos with the assistance of J. Cox, R. Cook, P. Jackson, and H. DiGeronimo
Lawrence University
Appleton, Wisconsin 54911

Availability:
DECUS (to members only)
Order #RSTS11-98
COSAP: VERSION 2B-A CONVERSATIONALLY-ORIENTED STATISTICAL ANALYSIS PACKAGE

COSAP is written in BASIC-PLUS for use on PDP-11 computers in an 8-9 KW user area under Version 7.0 of RSTS/E. Statistical analyses available include:

- marginal frequency breakdown
- histogram
- scattergram
- Student's t test
- chi square test
- cross tabulation (up to eight-way in a single command)
- first order Pearsonian product-moment correlation
- simple and multiple regression (up to 40 right-hand-side variables)
- analysis of variance
- discriminant analysis
- probit analysis
- factor analysis
- rank correlation

Version 2B of COSAP brings RSTS/E users a coherent and versatile statistical package featuring: convenient terminal data entry; flexible commands for editing or transforming data; a powerful select mode; a uniform data format; a conversational environment; ample capacity (up to 32767 observations on up to 4095 double-precision variables or 8191 single-precision variables).

The licensed package consists of the BASIC-PLUS source code for all modules, internal table files, test data files, and the BASIC-PLUS source code for BUILD, a powerful Lawrence program that is used to install COSAP Version 2B. Printed documentation includes detailed instructions for installation, codebooks for test data files, and the comprehensive User's Guide to COSAP.

Minimum Education Level:
College and University

Language:
RSTS/E Version 7.0

Developed By:
Computer Center Publications
Lawrence University
Box 599
Appleton, Wisconsin 54912

Availability:
Contact developer directly at the above address or telephone: (414) 735-6570.
## Application: Statistics

### DARTMOUTH STATISTICS PROGRAMS

**Description:**
Thirty-nine statistical routines developed at Dartmouth College have been converted to BASIC-PLUS for use with RSTS. The programs may be used individually or included in larger programs. The package includes:

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANOVAR</td>
<td>Factorial analysis of variance for up to 14 factors.</td>
</tr>
<tr>
<td>BACTZL</td>
<td>Bayesian analysis of 2-level contingency table.</td>
</tr>
<tr>
<td>CHISQ</td>
<td>Computes probability of a chi-square value with appropriate degrees of freedom.</td>
</tr>
<tr>
<td>CURREL</td>
<td>Computes a correlation coefficient.</td>
</tr>
<tr>
<td>FTEST</td>
<td>F-ratio probabilities (function).</td>
</tr>
<tr>
<td>FVALUE</td>
<td>Computes probabilities of F-ratio with n degrees of freedom.</td>
</tr>
<tr>
<td>GEOMEN</td>
<td>Geometric normality analysis.</td>
</tr>
<tr>
<td>LINFIT</td>
<td>Linear curve fit.</td>
</tr>
<tr>
<td>LSCF</td>
<td>Least squares polynomial curve fit subroutine.</td>
</tr>
<tr>
<td>NORDEN</td>
<td>Generates random normal deviates with mean of zero and variance one.</td>
</tr>
<tr>
<td>PHICOE</td>
<td>Computes Phi coefficient.</td>
</tr>
<tr>
<td>PRBSTA</td>
<td>Computes probabilities of 10 statements and their denials given probabilities of any three.</td>
</tr>
<tr>
<td>STAT01</td>
<td>Computes mean, variance, standard deviation and standard error of the mean for a group of data.</td>
</tr>
<tr>
<td>STAT02</td>
<td>Computes statistics for two data groups with equal variance.</td>
</tr>
<tr>
<td>STAT03</td>
<td>Computes statistics for two data groups with unequal variance.</td>
</tr>
<tr>
<td>STAT04</td>
<td>Computes chi-square statistics for 2-by-2 contingency tables.</td>
</tr>
<tr>
<td>STAT05</td>
<td>Computes chi-square statistics for m-by-n contingency tables.</td>
</tr>
</tbody>
</table>
STAT06 Calculates sign test and confidence interval.
STAT07 Computes signed rank sum (Wilcoxon procedure).
STAT08 Median test for two groups.
STAT09 Rank sum test for two data groups (Mann-Whitney).
STAT9 Linear regression, grouped observations.
STAT10 One-variable linear regression.
STAT11 Computes Spearman rank correlation coefficient for two data groups.
STAT12 Computes correlation matrix for n data groups.
STAT13 Analysis of variance, one-way, completely randomized.
STAT15 Analysis of variance, Latin square design.
STAT16 Analysis of variance, Graeco-Latin square design.
STAT17 Analysis of variance, balanced incomplete block design.
STAT18 Analysis of variance, Youden square design.
STAT20 Step-wise multiple linear regression.
STAT21 Computes one or more multiple linear regressions.
STAT33 Like "STAT13" with different data arrangements.
STATNW 34 statistical measures on a string of unweighted numbers.
STATWE 34 statistical measures for a weighted string of numbers.
TVALUE Computes two-tailed probability of T-value.
WALDS Wald's sequential test procedure.
STA2X2 Calculates various percentages and statistics for 2-by-2 data table.
QDECOM Calculates and displays the decomposition of Q for a 4-variable data table.
Minimum Education Level:
College and University

Language:
BASIC-PLUS

Operating System:
RSTS-11

Developed By:
Dartmouth College. Modified for RSTS by:
Al Higgins
Northfield-Mount Hermon School
Northfield, Massachusetts.

Availability:
DECUS (to members only)
Order #RSTS11-45
DATACHECK

Description:
DATACHECK is a computer program which renders a data evaluation and/or smoothing function in a data analysis setting. The data is input as a sequence of points \((X_i, Y_i, X_{i+1}, Y_{i+1}, \ldots)\), \(i = 1, \ldots, M\), stored on a disk file. This program implements an algorithm which will permit the evaluation of a fairly large data set (at least 1,000 records) in an interval manner. For example, if the user has additional information as to what the actual smoothed function of \(y\) should be or is at the initial point, such data can be input to the program. Further, if the user has reason to attach more weight or statistical significance to one or more intervals, such an option is available. Possible application areas are: data evaluation in biological instrumentation, air quality, and engineering environments.

Minimum Education Level:
All

Language:
BASIC, FORTRAN

Operating System:
RSTS/E, RSX-11M, VAX/VMS

Developed By:
Jon R. Prescott
J & S Associates
4933 Omar St.
Freemont, CA 94538

Availability:
Contact developer at the above address or telephone: (415) 657-8585, 657-8137.
Application: Statistics

DELTA EDUCATIONAL COMPUTING SYSTEMS — STATISTICS PROGRAMS

Description:
Programs include:

LNREG1
Simple Linear Regression Calculations. This program computes the slope and Y-intercept for a simple linear regression.

LNREG2
Simple Linear Regression Calculations. This program computes the slope and Y-intercept for a simple linear regression with several Y values and X value.

BINOPO
Probability Distribution Comparisons. This program compares the exact binomial probabilities with approximations given by the normal and Poisson distributions.

REGCOR
Regression and Correlation Analysis. This regression/correlation program performs simple regression and correlation analyses on a series of observation of the values of two variables.

CHISQ
Probability of Chi-Square Values. This program computes the exact probability of a chi-square value with specified degrees of freedom.

CHISQS
Chi-Squares Statistics for m*n Contingency Table. This program computes chi-square statistics for any number of m by n contingency tables.

GEOMEN
Statistics of Geometric Distribution. This program computes the geometric mean and standard deviation for a geometrically normal set of data.

PHICOE
Phi-Coefficient Calculations. This program computes the value of the phi-coefficient and the number of cases, n, for the data on two variables, x and y, presented in a 2 by 2 table.
<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORMAT</td>
<td>Correlation Matrix for n Series of Data. This program computes the correlation matrix for n series of m data elements.</td>
</tr>
<tr>
<td>ANVAR1</td>
<td>Analysis of Variance for a Randomized One-Way Design. This program computes an analysis of variance table for a completely randomized one-way design.</td>
</tr>
<tr>
<td>ANVAR2</td>
<td>Analysis of Variance (Latin Square Design). This program computes an analysis of variance table and F-ratios for a simple Latin square design.</td>
</tr>
<tr>
<td>HISTOG</td>
<td>Histogram. This program prints a normalized histogram on the user terminal from a set of data.</td>
</tr>
<tr>
<td>RANDEV</td>
<td>Random Deviates. This program generates random deviates in a normal distribution with the mean and standard deviation specified by the user.</td>
</tr>
<tr>
<td>STAT1</td>
<td>Statistics on Two Groups of Unpaired Data. This program computes the mean difference, variance of difference, standard error of difference, and T-ratio for two groups of unpaired data. It also gives the mean, variance and standard deviation for each group.</td>
</tr>
<tr>
<td>STAT2</td>
<td>Mann-Whitney Two-Sample Rank Test. This program compares two groups of data by means of the Mann-Whitney two-sample rank test.</td>
</tr>
<tr>
<td>STAT3</td>
<td>Spearman Rank Correlation Coefficients. This program computes the Spearman rank of correlation coefficient for two series of data.</td>
</tr>
</tbody>
</table>

Minimum Education Level:
College and University

Language:
BASIC-PLUS

264
Operating System:
RSTS/E V7.0

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
College of Education
University of Delaware
Newark, Delaware

Availability:
DECUS (to members only) and DELTA
Order #RSTS11-10
DESCRIPTIVE STATISTICS PACKAGE

Description:
This small package of programs and sample data files accompanies an introductory text entitled *Descriptive Statistics*, written by Harrison D. Weed, Jr., under the auspices of Project COMPUTe at Dartmouth College, and published by COMPress, Inc.

FREQDIST
Orders data supplied by user, determines range, constructs a frequency distribution and, if desired, a histogram; scale and/or frequency groups may be altered by user during course of run.

FREQTAB
Constructs a frequency table and, if desired, a line graph for data supplied by user.

STATMEAS
Orders data and computes measures of location and dispersion.

GROUP
Computes grouped mean, variance and standard deviation for continuous data.

Minimum Educational Level:
College or Advanced Secondary

Language:
BASIC

Operating System:
Independent; designed for transportability.

Developed By:
Harrison D. Weed, Jr.
Mathematica, Inc.
Princeton, New Jersey

Availability:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
ELEMENTARY STATISTICS LABORATORY

Description:
This package consists of 28 subprograms designed to be used in 49 computer laboratory exercises in elementary statistics. The exercises are published under the title Computer Exercises for Elementary Statistics, by Herbert L. Dershem. (Student and instructor manuals were developed under the auspices of Project COMPUTe at Dartmouth College and are published by COMPress, Inc.)

The subprograms are designed to be useful to the student in subsequent applications of statistics as well as for the work presented in the text. The preferred method of use is for the student to write his own program incorporating the prepared subprogram(s) for the particular application. A sampling of topics includes conditional probability, Bayes' formula, permutations and combinations, game simulations, testing random number generators, standard deviation, means, and medians, Chebychev's inequality, probability, normal, binomial and other distributions, sampling, confidence intervals, unbiased estimates, various kinds of tests, contingency tables, correlation and regression.

Minimum Educational Level:
College or Advanced Secondary

Language:
FORTRAN-76 (interactive)

Operating System:
Independent; designed for transportability.

Developed By:
Herbert L. Dershem and Elliot Tanis
Department of Mathematics
Hope College

Availability:
COMPress, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
Application: Statistics

GENSTAT

Description:
GENSTAT is a general statistical package which includes many standard statistical analyses, provides a powerful statistical programming language for the specification of other analyses and has extensive facilities for data management.


LANGUAGE AND DATA MANAGEMENT FACILITIES
GENSTAT offers the user a powerful interpretive programming and data manipulation language as well as a wide range of statistical analyses.

Features include:
Identifiers with up to eight significant characters, representing scalars, vectors, rectangular, symmetric or diagonal matrices and multiway tables with or without margins
Free format program layout
Concise syntax
Comprehensive diagnostics
Looping and branching
User control of alternation between compilation and execution phases
Free or fixed format input
Choice of channel for input and output
Missing values allowed
Data may be manipulated and condensed in input phase
Tables sensibly printed to allow easy assembly if larger than one page
Graphs, histograms and contour plots
Arithmetic operations on scalars, matrices and tables
Many functions, including pseudo-random-number generator, standard arithmetic functions, mean, median and variance and a range of matrix functions from trace to inverse
Logical elements allowed in arithmetic expressions
Macros, with facilities for private and standard libraries
Tables of totals, means or counts can be formed and manipulated
Editing of data, permitting formation of new structures
Organization of magnetic tape and disc files for temporary or permanent storage of data structures, with related structures stored automatically.
Minimum Education Level:
A knowledge of statistics is essential.

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
Rothamsted Experimental Station-
The Statistics Department

Availability:
For further details, contact:
The GENSTAT Coordinator
NAG Central Office
7 Banbury Road
Oxford OX2 6NN
United Kingdom
Application: Statistics

GLIM-3

Description:
GLIM-3 is a statistical package designed for use in
1. Generalised linear modelling
2. Vector calculation, with various output options
3. Data exploration
4. Teaching

As a modelling aid, GLIM-3 handles linear, loglinear, logit and probit
models and models with gamma errors. Specification of standard mo-
dels is simple but powerful, allowing refinements such as prior weights
and the fixing of certain parameter values. Any generalized linear
model can be handled and robust regression procedures developed.
Powerful macro definition facilities are available.

GLIM-3 can operate with general arithmetic expressions on vectors
and scalars; sub-vectors are easily manipulated. The package can be
used interactively or in batch mode, interactive use being particularly
appropriate to data exploration, for instance in the search for linearity
inducing transformations. As a teaching aid it enables the student to
concentrate on statistical aspects of a problem, without concern about
arithmetic.

Minimum Education Level:
A knowledge of statistics is essential.

Language:
FORTRAN

Operating System:
RSX-11, RSTS, UNIX, VAX/VMS

Developed By:
British Royal Statistical Society

Availability:
For further detail contact:
The GLIM Coordinator
NAG Central Office
7 Banbury Road
Oxford OX2 6NN
United Kingdom
Application: Statistics

LP

Description:
LP uses the mathematical tool of linear programming to compute the maximum or minimum (if possible) of a given linear (vector) function with specified constraints on the individual (vector components). If LP finds that there is no feasible solution or an unbounded one for a given linear program, it states this in the output of the terminal. The user may specify the number of variables and/or constraints when LP is run. Constraints of the form “greater-than”, “equal-to”, and “less-than” are permissible.

LP can be utilized to conduct structural analyses on building frames which are subject to different loads or stresses (i.e., minimize the stress force). LP can also be used for work measurement analyses, as well as other fairly diverse engineering applications.

Minimum Education Level:
All

Language:
FORTRAN, BASIC

Operating System:
RSTS/E, VAX/VMS

Developed By:
Jon R. Prescott
J & S Associates
4933 Omar St.
Freemont, CA 94538

Availability:
Contact the developer at the above address or telephone: (415) 657-8585, 657-8137.
Application: Statistics

MINITAB STATISTICAL PACKAGE

Description:
MINITAB is an interactive statistical computing system that provides data analysis tools for the statistician and non-statistician alike. Simple jobs (e.g., do a log transformation, a plot, and fit a regression model) require just a few straight-forward commands. Therefore, users new to Minitab need less than one hour of instruction to get started. Online HELP allows users to check the syntax of a command or learn more about Minitab. A completely compatible batch version is also available.

Capabilities include:

a) input and output of data using free-field or format, from terminal, disk file, tape, or cards;

b) Minitab SAVE files for quick and easy I/O;

c) flexible data transformations and arithmetic;

d) descriptive statistics such as means, medians, standard deviations;

e) plots and histograms;

f) regression analysis including weighted regression, stepwise regression, diagnostics, and residual analysis;

g) multiway tables (one to 10 factors) including crosstabs, chi-square tests, tables of means, medians, proportions and other statistics, flexible printing layout, several factors can be nested in one table;

h) Box-Jenkins univariate time series models including ACF's, PACF's, plots, difference data, lag data, fit and forecast ARIMA models;

i) EDA methods including stem-and-leaf displays, boxplots, median polish, resistant line fits, letter value displays, coded tables, condensed plots, resistant smoothers, and rootograms;

j) nonparametrics, analysis of variance, random data generators, simple looping;

k) matrix operations including add, subtract, multiply, invert, transpose, and eigen analysis.

All computers receive FORTRAN source. PDP-11 computers also receive the task image.
Minimum Education Level:
College and University

Language:
FORTRAN IV

Operating System:
RSTS/E, VAX/VMS

Developed By:
MINITAB Project
The Pennsylvania State University

Availability:
MINITAB Project
Statistics Department
The Pennsylvania State University
215 Pond Laboratory
University Park, Pennsylvania 16802
(814) 865-1595
NON-PARAMETRIC REGRESSION (NPR)

Description:
NPR performs a (non-linear) regression analysis with two principal differences: 1. the distribution of data for the variables do not need to be approximately normal; 2. the case of "missing data" poses no real problem in general (unless the number of missing values is on the extreme side). (Of interest i a numerical analysis sense is that NPR computes the 1st and 2nd derivates of the best fit (and plots each in the output)). NPR outputs: 1. a listing/display of all input data; 2. plot of fitted data versus actual data. The feature in itself should demonstrate non-linearities between "x" and "y" on an interval by interval basis, as well as possible problems with data quality (e.g., "noise"). 3. plots of 1st and 2nd derivatives of the best fit curve vs. actual data.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
RSTS/E, RSX-11M, VAX/VMS

Developed By:
Jon R. Prescott
J & S Associates
4933 Omar St.
Fremont, CA 94538

Availability:
Contact developer at the above address or telephone: (415) 657-8585, 657-8137.
Application: Statistics

PDF

Description:
PDF computes the probability density function (if applicable) for a given set of data provided by the user. The user has a variety of types of distribution functions such as Poisson, Weibull, Gamma, Lognormal, and Exponentials. PDF also plots the estimated or calculated probability density function, if desired by the user. PDF may be used for curve fitting by the method of nonlinear least squares.

Areas of application of PDF include: reliability/failure rate models, biological systems analysis.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
RSTS/E, VAX/VMS

Developed By:
Jon R. Prescott
J & S Associates
4933 Omar St.
Freemont, CA 94538

Availability:
Contact developer at the above address or telephone: (415) 657-8585, 657-8137.
Application: Statistics

P-STAT 78

Description:
P-STAT is a large, interactive computing system for file maintenance, data display, and statistical analysis. It can be used for purposes ranging from simple file handling and record-keeping to complex statistical operations such as stepwise regression and factor analysis. It can be used by an introductory sociology class or by a government census bureau.

The DATA program is the primary tool for creating a P-STAT system file. It is designed to detect and report any obvious errors in input data. This report includes the bad value, the variable in question, the case identifier and the number of the erroneous record. Checks are also made on cases of data containing multiple records to ensure that the records belong together and are in the proper order.

Many files can be active during a single P-STAT run, which is often a flow from one file to the next. A typical run could include joining, subsetting, collating and sorting P-STAT files, combined with data modification, and perhaps computing some correlations, regressions, and crosstabulations. It is possible to join files together in either a left-right or an up-down direction, sort files, locate the cases which are present in both of two files, and at the same time generate files of the cases which are not matched.

P-STAT provides many capabilities for the statistical analysis of data. Chi-square, F-tests, T-tests, means and standard deviations are readily available. Commands are also provided to produce correlations, regressions, factor analysis, rotations, and discriminant analysis. Each of these commands can produce various kinds of output system files which can then be used as input to other commands. Other statistical procedures include MANOVA (multivariate analyses of variance) and a number of matrix operators. P-STAT also contains interfaces which allow the user to read or write BMDP or SPSS savefiles during a P-STAT run.

Data may be displayed in many different formats. These include: 1) a program to list a file concisely; 2) frequency distributions; 3) histograms; 4) plots; and 5) the most extensive crosstabulation facilities available in a statistical package. Crosstabulation options include percentages, means, side-by-side, nested and n-way tables, and many options in formatting, such as choice of edges, zeros or blanks in the cells, and other cosmetic features. In interactive mode, numerous tables can be generated and then individually accessed for modi-
fication. The final version of a table can then be sent to a printer or saved as a system file.

P-STAT is conversational in interactive mode. Features designed specifically to enhance interactive usage of the system include an automatic pause for use with screen terminals free-format data input, prompting, help messages, and an online help file. In addition, a MACRO facility provides for simple execution of often-repeated command sequences.

**Minimum Education Level:**
College and University

**Language:**
FORTRAN

**Operating System:**
VAX/VMS

**Developed By:**
P-STAT, Inc.
P.O. Box 285
Princeton, New Jersey 08540

**Availability:**
Contact developer directly: (609) 924-9100.
Application: Statistics

SCIENTIFIC SUBROUTINE PACKAGE

Description:
The Scientific Subroutine Package is a collection of FORTRAN IV subroutines which provides the user with a large cross section of those mathematical and statistical routines commonly required in scientific programming. Currently, there are over 100 routines in this collection. They are all I/O free and are provided in source form. The source listings give a brief outline of the method used, as well as a bibliographical reference in the more complex routines.

The algorithm used in each routine was selected on the basis of (1) minimum storage, (2) accuracy of the implementation (which was determined by its past history, among other factors), and (3) its speed of execution. In certain cases, these criteria were conflicting and the speed of execution was considered most important. Many of the larger statistical routines were programmed as a collection of several smaller routines. This was to enable easier implementation in larger programs where overlays were a necessity.

Minimum Education Level:
Secondary

Language:
FORTRAN IV

Operating System:
RSTS/E

Developed By:
Digital Equipment Corporation

Availability:
Digital's Software Distribution Center (#QJ960). Contact your local DIGITAL office.
SCSS™ CONVERSATIONAL SYSTEM

Description:
The SCSS Conversational System is a comprehensive package of statistical procedures and data management facilities. It is specifically designed to allow complete interaction between the researcher and the data, creating an ideal environment for research and for instruction in data analysis techniques.

The SCSS Conversational System is based on dialog: the system prompts for the information it needs to carry out an analysis, while you direct the analysis with your responses. The language is simple, and help and explanations of procedures are readily available at any time. Choose among prompting levels to obtain as much or as little information as you specify. Experienced SCSS users can bypass system prompts by simply issuing commands. With this flexibility you can concentrate on applying statistical procedures and interpreting results, rather than on the mechanics of obtaining output.

In the conversational environment of SCSS, students can see immediately the result of data transformations, for example, and particular options in statistical procedures. This not only promotes systematic learning but also prevents the frustration of submitting and resubmitting jobs to correct the beginner's inevitable errors. This system constitutes a comprehensive approach to teaching data analysis.

For research, the SCSS Conversational System offers a full range of statistical procedures, from simple tables and plots to multiple regression and factor analysis.

Minimum Education Level:
All (Some knowledge of statistics)

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
SPSS, Inc.

Availability:
For further details, contact:
Pakhoed Computer Services
3000 AW Rotterdam
P.O. Box 363
60-68 Boompjes
Holland

or telephone: Piet van der Maas on: Rotterdam 302355
Application: Statistics

SPSS-11

Description:
SPSS-11 is a software package for tabulation, statistical analysis and general purpose data management designed for Digital PDP-11 computers. Highlights of its statistical capabilities include: frequency distribution, crosstabulation, multiple regression, analysis of variance, discriminant analysis and survival analysis. Data management facilities permit simplified handling of large files and subfile structures, as well as recoding of existing variables, creation of new variables and selection, sampling and weighting of specific cases. The powerful report generator produces customized, camera-ready reports to the user's specifications. With the SPSS-11 editor both command syntax and order can be reviewed prior to job execution.

Minimum Education Level:
College and University (plus Elementary and Secondary Administration)

Language:
FORTRAN

Operating System:
RSTS/E, RSX

Developed By:
SPSS Inc.
Chicago, IL

Availability:
Susan Phelan
SPSS Inc.
Suite 3000
4444 North Michigan Ave.
Chicago, IL 60611
(312) 329-2400
Application: Statistics

**STAT11**

**Description:**
STAT11 provides a statistical package that permits interactive remote terminal communication between the computer and a user who need not be familiar with computers or programming. STAT11 questions the user in a simple conversational manner, taking the user through procedures necessary to enter data parameters, and to perform the desired analyses.

Some of the features of STAT11 are:

- STAT11 runs under the PDP-11 Extended Resource Sharing Timesharing System (RSTS/E).
- Conversational mode proceeds through each stage of analysis.
- Data can be entered and modified with the STAT11 editor. STAT11 will also accept data generated independently by a BASIC-PLUS program.
- STAT11 provides the following types of analysis:
  - **ELEMENTARY STATISTICS** — including number of subjects, minimum, maximum, range, mean, standard deviation, and standard error
  - **CROSS TABULATION**
  - **CORRELATION**
  - **RANK CORRELATION** — Kendall Tau Coefficient
  - **CHI-SQUARE** — optional Fisher Exact Probability
  - **T-TEST** — Under one of four different hypotheses
  - **REGRESSION** — Linear, Stepwise, Multiple
  - **SCATTER DIAGRAM**
  - **HISTOGRAM**
  - **LINE PLOT**
  - **DATA TRANSFORMATION**
  - **ANALYSIS OF VARIANCE** — Two models are available

**Minimum Education Level:**
College and University
Language:  
BASIC-PLUS

Operating System:  
RSTS/E

Developed By:  
Originally by Digital Equipment Corporation. Significant modifications and revisions by Central State University, Edmond, Oklahoma, and Callier Center at the University of Texas, Dallas, Texas.

Availability:  
DECUS (to members only)  
Order #RSTS11-110
Application: Statistics

STAT, VERSION 8C.03

Description:
STAT is a large sophisticated statistical package containing approximately 30 statistical analyses within one homogenous program. It contains:

- Simple population statistics and listings.
- Regression statistics.
- Analysis of variance.
- Several non-parametric analyses.

There is also a sophisticated program (OUTLAY) for interactive construction of data files, which also supports an interface to SPSS files.

A graphical version of the statistical program and a program for non-linear regression using user-defined subroutines in a GAUSS-NEUTON minimization is in this package.

The main program is extremely modular and can be adapted to most applications.

Minimum Education Level:
College or Advanced Secondary

Language:
FORTRAN

Operating System:
VAX/VMS

Developed By:
Lars Palmer
AB Hassle
Molndal, Sweden

Availability:
DECUS, MR2-3/E55
One Iron Way
Marlboro, MA 01752
Order DECUS #VAX-5
TIME SERIES PACKAGE 3.5B

Description:
The Times Series collection is a package of interactive computer programs aimed at providing methods for analyzing time series following the widely acclaimed Box-Jenkins methodology. The user needs to have no knowledge of computer programming. The intended user is a person interested in analyzing time series, not a computer specialist. The collection of time series programs includes programs for the analysis of univariate time series (e.g., sales data) using ARIMA models and programs for modelling a multiple process (e.g., sales as a function of advertising expenditures).

For the analysis of univariate time series, both seasonal and nonseasonal, there are three programs: IDENT for identifying a time series model, ESTIMA for estimating (Least Squares and Maximum Likelihood) the parameters of a model, and FRCAST for making forecasts conditional on the estimates obtained by ESTIMA.

For the analysis of a multiple time series model, i.e., a model with one or more independent variables (also called a transfer function model), there are again three programs: CROSSC for identification, TRFEST for the estimation, and TROFFOR for forecasting based on transfer function models.


Minimum Education Level:
Graduate

Language:
FORTRAN/MACRO

Operating System:
VAX/VMS

Developed By:
Walter Vandaele
MIT, Sloan School of Management
Building E40
1 Amherst Street
Cambridge, MA 02139

Availability:
Contact developer directly at above address or telephone: (617) 253-8404.
Application: Statistics

XYPLOT

Description:
This program calculates and plots a series of data values (for example, a regression line) over a given time frame. This is done in econometric and/or forecasting applications in the business world. The user has some choice as to plotting symbols and regression method.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
RSTS/E, VAX/VMS

Developed By:
Jon R. Prescott
J & S Associates
4933 Omar St.
Freemont, CA 94538

Availability:
Contact developer at the above address or telephone: (415) 657-8585, 657-8137.
GRAPAK: GRAPH PACKAGE

Description:
GRAPAK is a suite of programs designed for producing graphs on Teletypes, lineprinters, and similar devices. It has facilities for processing experimental data (in up to four parameters), carrying out intermediate calculations, and least squares fitting if required. In addition, general functions can be plotted alone, combined with other functions (no limit on the number of functions), or combined with experimental data. This package has many applications and may be useful whenever data is to be displayed graphically. It is not designed to drive a graph plotter.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E (Version 6A or later)

Developed By:
A.E. Lawrence
Luton College of Higher Education
Luton, Bedfordshire, U.K.

Availability:
DECUS (to members only)
Order #RSTS11-114
Application: Graphics

LAURENCE PLOTTING PACKAGE FOR BASIC-PLUS

Description:
The Lawrence Plotting Package for BASIC-PLUS contains compact, versatile, coordinated sets of subroutines for producing graphs on a wide variety of devices (Tektronix 4006, 4010 family, 4025, 4027, 4662; Hewlett-Packard 7220A/S; TSP-12; character-oriented terminals). The primary plotting subroutines (SCALE, PLOT, FINISH, NOPLOT, SETTRM, SELCOL, NEWPAG, AXIS, GRAPHN, COORDN, and RELTRM) are contained in a single BASIC-PLUS source file for each device. Other subroutines include LETTER (draws character strings positioned horizontally or vertically; two fonts supplied, other easily added), PIE, BAR, and LBAXIS (labels axes).

The user writes only a device-independent driving program that calls (via the instruction GOSUB nnnnn) the proper sequence of plotting subroutines as it determines the succession of points whose plotting will generate the desired display. The user then appends the subroutines for the device to be used and runs the resulting complete program to produce the plot. Full documentation of the package is contained in a System Manager’s Guide, which includes detailed descriptions of the coding, and a User’s Guide, which explains how to write driving programs using the package.

Minimum Education Level:
Secondary School

Language:
BASIC-PLUS

Operating System:
RSTS/E, Version 7.0

Developed By:
Dr. David M. Cook
Lawrence University
Box 599
Appleton, Wisconsin 54912

Availability:
Contact:
Dr. David M. Cook
Computer Center Publications
Application: Graphics

MIDDLEBURY COLLEGE UTILITIES AND PLOTTING PACKAGE

Description:
The following programs are available in this package:

PLOT10/

PLOTHP BASIC-PLUS functions for complete support of Tektronix 4010 terminals; it includes functions for annotated axes, labeling at any angle, plotting lines with and without symbols for data points, and support of graphic input mode. Requires only 3K words in addition to program. PLOTHP allows for the same program to produce identical plots on an HP7200 plotter without any program changes. Includes a user's guide in RUNOFF format.

MESMAN Program to provide "mailbox" type of message facility when users log onto RSTS. Special provisions for privileged and project director user numbers.

SYSMAN Monitors terminals to insure no unused terminals are left logged onto the system; also collects terminal usage statistics by KB number.

MONEY/CHANGE Complete rewrites of DEC CUSPs with added functionality and ease of use features, including group entering and deleting of accounts, usage statistics selectable on groups and printed in ppn order with totals and subtotals, and convenient password changing for nonprivileged users.

BAT/TBAT A low overhead (5K word with insignificant CPU utilization) extremely simple to use alternative to DEC Batch. The TBAT version uses the user terminal for a log file, providing for indirect command file capability for any RSTS program. User's guide in RUNOFF format included.

GAMES Program which controls access to game and demonstration programs based upon selected
parameters including time of day, day of week, and number of active terminals on the system.

Language: BASIC-PLUS

Operating System: RSTS/E

Developed By: Middlebury College
Middlebury, Vermont 05753

Availability:
DECUS (to members only)
Order #RSTS11-109
MULTI-PICTURE SYSTEM (MPS)

Description:
Refresh line-drawing system; highly interactive; capable of displaying 2D or 3D objects; hardware performs real-time dynamic rotation, translation, scaling, zooming, clipping, perspective, viewportion, depth-cueing, segmented buffering, hit testing, and $4 \times 4$ matrix concatenation; wide range of line and character generation features; interactive devices including data tablet, light pen (MPS only), dials, switches, buttons, joysticks, keyboards.

MULTI-PICTURE SYSTEM supports up to four work stations per system and up to four systems per computer. Software supplied includes FORTRAN-Callable subroutines for general graphics programming and (optionally with MPS) multi-system/station driver builder. Application software available from users include CAD, molecular modelling, protein crystallography, flight simulation, and others.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS (MPS only), RSX-11M

Developed By:
James F. Callan
General Sales Manager
EVANS and SUTHERLAND
580 Arapahoe Drive
Salt Lake City, Utah 84108

Availability:
Contact developer at the above address or telephone: (801) 582-5847.
Application: Graphics

PLOT

Description:
PLOT is a BASIC software package designed for plotting orbits and other multivalued curves on small computers with limited storage capacity. The program was designed for use with the text *Graphical Mechanics* by Elisha Huggins and published by COMPRESS, Inc. It contains a self-study chapter on how to use the program and plot orbits.

The program, which works with a variety of terminal types, plots multivalued functions by storing the calculated points and printing them all at once upon command. The program is less than 100 lines long so that it fits before line 100 in the user's program. It is accessed by three simple GOSUB commands, one to set scales, one to store points, and one to plot the curve. The total length of the program, including storage, is about 1000 bytes, so that it will work on 4K byte microcomputer systems.

Minimum Education Level:
College or Advanced Secondary

Language:
BASIC

Operating System:
Independent; designed for transportability.

Developed By:
Elisha Huggins
Department of Physics
Dartmouth College
Hanover, New Hampshire

Availability:
COMPRESS, Inc.
P.O. Box 102
Wentworth, New Hampshire 03282
PLOT 10 EASY GRAPHING

Description:
PLOT 10 EASY GRAPHING transforms columns of numbers into meaningful graphs and 8½ x 11 overhead transparencies. TEKTRONIX has released this new package to support the 4010 family of terminals, as well as the new 4027 color display terminal. The EASY GRAPHING package includes a high-level, simple command language for turn-key operation. Features include: line graphs with special symbols, bar charts with selectable shading, centered titles, movable legends, adaptable axis labeling, saving and retrieving command files, changing data elements. The program fits in 16 to 32Kw on a PDP-11. The display manager option features include pie charting, log and calendar axes labeling.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
RSX-11M, VAX/VMS

Developed By:
Mr. Will Gallant
TEKTRONIX, Inc.
P.O. Box 500 D.S. 63-336
Beaverton, Oregon 97077

Availability:
Contact the developer at the above address or telephone: (503) 685-3785.
PLOT 10 TERMINAL CONTROL SYSTEM

Description:
PLOT 10 TERMINAL CONTROL SYSTEM has become a standard in software for computer graphics in engineering. PLOT 10 TCS supports the TEKTRONIX line of low cost, high resolution, storage display terminals and plotters. PLOT 10 TCS is supplied as a library of FORTRAN IV routines. PLOT 10 TCS adds graphics display capability to almost any computer supported engineering application. A display can be created interactively with zooming, clipping, windowing and an assortment of other graphics transformations. User manuals, quick reference cards, installation guides, and system level documentation are supplied along with source code. PLOT 10 TERMINAL CONTROL SYSTEM is the nucleus of several specialized graphics packages. Support is provided for multiple displays, plotters, and new concepts in distributed graphics processing using intelligent terminals.

Minimum Education Level:
All

Language:
FORTREN

Operating System:
VAX/VMS, RSX-11

Developed By:
Mr. Will Gallant
TEKTRONIX, Inc.
P.O. Box 500 D.S. 63-336
Beaverton, Oregon 97077

Availability:
Contact developer at the above address or telephone: (503) 685-3785.
Application: Graphics

PLOT 11

Description:
PLOT 11 is a software package containing a set of FORTRAN-callable graphics subroutines and an XY11 or XY311 plotter driver. The subroutine package is called by a user task. The subroutines operate in conjunction with the XY11 incremental plotter driver to provide the PDP-11 user with a versatile plotting capability. Output can be plotted online, or spooled to a mass storage device for later plotting.

PLOT 11 with the XY11 Plotter Control can be interfaced to a variety of plotters, providing the user with drum, fan-fold, or flat bed capabilities. Single pen plots of either .01 inch, .005 inch, or 0.1 millimeter steps can be generated at speeds up to 200 steps per second. The XY311 Plotter Control can plot either .002 inch or .05 millimeter steps at speeds up to 1800 steps per second on roll paper 34.2 inches in width, 120 feet in length. This option provides the capability of selecting one of three pens for multicolor plots.

The subroutine package includes routines for both character and line drawing. As all operations are program controlled, either axis or both axes can be addressed in positive or negative incremental steps. The graphics subroutine library requires 4000 words of memory.

Minimum Educational Level:
Secondary

Language:
FORTRAN

Operating System:
RSTS/E

Developed By:
PLOT-11 is a Software Product developed by Digital Equipment Corporation.

Availability:
Contact your local DIGITAL office.
Application: Graphics

REDAC MINI PCB DESIGN SYSTEM

Description:
REDAC is a Computer-Aided Design system (CAD) for designing of PCB or schematic diagram. The system is fully automatic, with automatic routing, component placement, and design rules checking. The system will design boards up to 300 IC'S, and is particularly effective for analog board designs. Features include: user interaction, refresh graphics CRT, quick response, and outputs from system with full repertoire of manufacturing documents.

Minimum Education Level:
All

Language:
MACRO-11, FORTRAN

Operating System:
RSX-11, VAX/VMS

Developed By:
REDAC Interactive Graphics
1 REDAC Way
Littleton, MA 01460

Availability:
Contact developer at the above address or telephone: (617) 486-3529.
Application: Graphics

ROTATE, POLY, PLOT 10, XY PLOT

Description:
Programs include:

ROTATE  
Eliminates the xy term from the general quadratic equation
Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0
by counterclockwise rotation of the coordinate axes by angle theta.

POLY  
Routines for defining a polynomial, inverting, integral, derivative, evaluation, and fitting an equation to a set of points.

PLOT 10  
Plots up to 10 functions.

XY PLOT  
Plots a function with the y-axis horizontal and the x-axis vertical.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E Version 4A

Developed By:
Students at Northfield-Mount Hermon School, Northfield, Massachusetts

Availability:
DECUS (to members only)
Order #RSTS11-26
Application: Graphics

SDRC GRAPHICS SYSTEM

Description:
The SDRC GRAPHICS SYSTEM is an interactive finite element pre- and post-processing software package. It frees designers and analysts of the routine demands of model preparation and simplifies results interpretation by providing graphical representations.

The pre-processing software, SUPERTAB, is used to prepare large amounts of geometric data for finite element analysis. SUPERTAB provides the user with the ability to create, edit, and display two- and three-dimensional models using an interactive graphics terminal and digitizing tablet. Geometric modeling and mesh generation capabilities allow rapid creation of nodes and elements while model checking and viewing options permit quick isolation and correction of model errors.

The post-processing software, OUTPUT DISPLAY, enables designers to visualize analysis results by drawing either line or continuous-tone color stress contour plots. The user can interactively select Von Mises, maximum principal, or shear stresses for display. Deformed geometry and animation capabilities permit the user to visualize how the product will behave under static and dynamic loads.

User-oriented features of the SDRC GRAPHICS SYSTEM:
• Training packages—from introductory two-day sessions with training manuals to user seminars.
• User manuals with removable command flowcharts.
• Ease-of-use features:
  — Menu and keyboard command input
  — Help commands
  — Task program structure
• Continuous software support
• Ongoing maintenance and enhancements option

SDRC GRAPHICS SYSTEM is one program in a library of SDRC programs which provides comprehensive experimental and/or analytical capabilities for the design and development process.

Minimum Education Level:
College or University
Language:
FORTRAN

Operating System:
VAX/VMS, RSX-11M

Developed By:
Structural Dynamics Research Corporation
2000 Eastman Drive
Milford, Ohio 45150

Availability:
Contact:
Mr. Richard C. Miller
SDRC CAE, International
300 TechneCenter Drive
Milford, Ohio 45150
(513) 576-3800
Application: Networks/Communications

BURCOM-11 DEC/BURROUGHS COMMUNICATION SYSTEM

Description:
BURCOM-11 allows a DEC PDP-11 to communicate with Burroughs computers using synchronous or asynchronous communication techniques. PDP-11's may also communicate with each other using BURCOM-11. BURCOM-11 is supported under RSX-11M, RSX-11S, and RSTS/E.

Using either dial-up or leased telephone lines, BURCOM-11 supports the Burroughs poll-select and point-to-point conversational protocol to give high through-put data transmission with low operating system overhead. Multiple buffers may be used to insure that the transmission link is fully utilized. Error detection and record retransmission are handled automatically by BURCOM-11.

BURCOM-11 provides user-callable subroutines for sending and receiving messages, establishing a transmission link (including dialing of numbers), terminating a link, and reviewing the line status and error counts.

DEC interface hardware supported include the DU11, DP11, and DUP11 synchronous interfaces, the DL11 asynchronous interface and the DN11 auto-dial interface. The KG11 arithmetic unit is not required for operation.

Minimum Education Level:
Secondary School

Language:
MACRO-11

Operating System:
RSX-11M, RSX-11S, RSTS/E

Developed By:
Applied Information Systems, Inc.
500 Eastowne Drive, Suite 207
Chapel Hill, N.C. 27514

Availability:
Contact developer directly at above address or telephone: (919) 942-7801.
HASPBOX

Description:
HASPBOX provides full HASP RJE emulation capabilities in an easy-to-use package. The HASPBOX system consists of protocol software loaded in a small PDP-11 based front-end processor; connection of this front-end to the UNIBUS of a VAX or PDP-11 host; and control software running on the host.

All communications protocol overhead, including ASCII/EBCDIC translation, dummy buffering, compression, CRC calculation, and error recovery is handled in the front-end processor, not on the Digital host.

The IBM central host views the HASPBOX system as a full 360/20 HASP multileaving workstation. This Remote Job Entry (RJE) protocol is supported on all IBM and IBM look-alikes except those running the DOS/VS operating system.

The use of HASP protocol gives several important capabilities. The Digital system has multiple concurrently-operating I/O channels to the IBM system. Output returning from several jobs may be received simultaneously. Several input channels may be active at the same time. The Digital system has full use of an IBM workstation operator’s console. Input and output queues may be controlled, job status reports may be received and data channels may be started and directed. All control activity via the console is independent of activity on the data channels.

Notes:
1. HASPBOX can operate in either workstation or central mode. In workstation mode, it operates as a standard HASP workstation. In central mode, it can communicate with standard HASP workstations. Thus, existing RJE workstations can be utilized for job submission and return.
2. HASP protocol utilizes full string compression. This can result in line throughput increases of up to 35%.
3. Sites which have a great deal of lineprinter output from the IBM central may attach a lineprinter directly to the HASPBOX front-end processor. This eliminates most host overhead when printing IBM output.
4. HASPBOX will operate over full-duplex (four wire) and half-duplex (two wire) circuits at line speeds from 2,000 to 19,200 baud. A 56Kb version is available.
5. HASPBOX can log all line activity into a disk file. This creates an audit trail from which utilization and turnaround statistics may be extracted.

6. The HASPBOX front-end CPU's composed entirely of standard Digital components and is maintainable by Digital Field service.

**Minimum Education Level:**
College or University

**Operating System:**
VAX/VMS, RSTS/E, RSX-11M

**Developed By:**
Software Results Corporation
1229 West Third Ave.
Columbus, Ohio 43212

**Availability:**
Contact Jim Ebright, Director of Marketing, at Software Results Corp., or telephone: (614) 421-2094.
HASP—MULTILEAVING RJE WORK STATION

Description:
The HASP program package connects a VAX to an IBM-type machine as a multileaving remote job entry station, and conforms to the original HASP standards.
The standard HASP protocol supported includes:
1. Data compression of duplicate characters
2. Full EBCDIC transparency
3. "Multileaving"
4. Carriage Control for printer supported (all FORTRAN options)
5. Multiple Input—Output streams
   (printer, card punch, card read, console commands, messages)
The HASP Slave Program Package consists of a Binary Synchronous Driver (BSDRIVER) and the HASP program and runs under VAX/VMS.
The BSDRIVER is programmed in MACRO and requires a DUP11 interface.
The HASP programs are written in VAX FORTRAN and run as a normal batch job, consisting of a Main Process and several subprocesses. The data transfer between the subprocesses occurs via Mailboxes. Remote Submits and Console Commands can be performed from any terminal except the System Console. The print and punch output are left in the disk files for inspection.

There is a HELP file to aid in the operating of HASP and a detailed Installation Guide.

Minimum Education Level:
All

Language:
FORTRAN, MACRO

Operating System:
VAX/VMS

Developed By:
R.W. Lutz
Max-Planck-Institute fur Biochemie
D-8033 Martinsried b. Munchen
West Germany
Availability:
Contact developer directly at above address or telephone: (089) 8585/724
Application: Networks/Communications

MESSAGE

Description:
This program was written for users on the system to talk to each other. The program will determine authorized message senders and receivers based on information stored in sections of the message database.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
University of Delaware
College of Education
Newark, Delaware 19711

Availability:
Contact developer directly at the above address or telephone: (302) 738-2160.
MUX200/VAX MULTITERMINAL EMULATOR

Description:
MUX200/VAX is a VAX-11 based software package which provides communication with a CDC 6000, CYBER series, or other host computer system capable of using 200 UT mode 4A communications protocol.

Any VAX-11 interactive terminal may be used to control remote job entry or to communicate at command level with the host system. Input files may be sent from and output files received onto any VAX-11 supported mass storage, unit record, or terminal device.

MUX200/VAX communicates with the host using the Mode 4A communications protocol as defined in CDC publication 82128000. The software package can be configured to support either the ASCII or the external BCD versions of the protocol.

MUX200/VAX provides for one synchronous communication circuit to a host computer system. The product supports a single switched or dedicated leased line two- or four-wire common carrier facility at speeds up to 9600 bps.

MUX200/VAX enables several users to communicate simultaneously with a host system over a single line. The VAX/VMS system, while using a single physical drop, appears to the host as a number of multidrops and terminals on the circuit. The maximum number of simultaneous users supported by the MUX200/VAX system is 16. However, this may be limited to a lower figure by host hardware or software.

Features:
• Output received from the host system may be spooled to the lineprinter upon detection of a text string predefined by the user.
• Up to eight VAX/VMS files may be specified for transmission to the host in a single command.
• VAX/VMS terminals may be detached for other use while the software package is operating. Data received from the host directed to a terminal is saved for print-out until the terminal is reattached.
• In many applications the host system can be off-loaded by taking advantage of the local processing power of the VAX/VMS system. This reduces host processing and line costs; for example, file editing can be performed locally rather than on the host.
Minimum Hardware Required:
Any valid VAX/VMS configuration with a DUP11 synchronous communication interface.

Operating System:
VAX/VMS Version 1.5

Developed By:
Digital Equipment Corporation

Availability:
Contact your local DIGITAL office.
SHARABLE HASP AND UT200 EMULATIONS

Description:
TYCHO/HASP and TYCHO/UT200 integrate sharable emulations of HASP and UT200 workstations into RSTS/E or VAX/VMS systems for Remote batch Job Entry (RJE) to IBM or CDC mainframes.

RJE functions are available to all logged-in users concurrently with RSTS or VAX/VMS timesharing services. DIGITAL standard disk structures and user disk areas are employed. The emulations include a management/queuing subsystem that permits the user to enter and launch RJE jobs from their own disk area, route returns to a RSTS or VAX/VMS printer or back to their disk area, and monitor the status of their RJE jobs from the user’s keyboard. Once launched, RJE job submissions to and returns from the remote site are managed automatically, whether or not the user remains logged-in. Hooks are provided for chaining with the System Manager’s own software. Both packages may be installed on larger systems.

A “hot” card reader/spooler add-on (CRQUE) is available. Dedicated hardware required by each package is one DUP11. Other supported devices include: KMC11 (for higher performance under RSTS), DU11, DV11, and DQ11.

Operating System:
RSTS/E (PDP-11/34s and up)
VAX/VMS (VAX-11/750 and up), native mode implementations

Developed By:
TYCHO Research Associates Inc.
995 Waterloo Street
London, Ontario N6A 3X4, CANADA
TELEX: 064-7159

Availability:
Both packages are distributed and supported by TYCHO. For more information, write, TELEX, or call (519) 679-1367, MTWT, 9am-2pm eastern time.
Application: Networks/Communications

SPERRY UNIVAC/NTR PROTOCOL EMULATOR

Description:
The NTR protocol emulator for VAX/VMS systems communicates with the Nine Thousand Remote (NTR) symbiont on Univac 1100 series computers running EXEC Version 36. The NTR emulator allows the VAX system to send jobs to and receive output from a remote Univac 1100 series computer. Although NTR is a remote job entry protocol and not a file transfer protocol, this emulator contains some features which allow a user to simulate file transfers. The major features of this emulator are:

- NTR synchronous communications protocol
- Switched, leased, or local communications link
- Line speeds up to 9600 baud
- DUP-11 synchronous communications interface
- ASCII interface to the emulator

Minimum Education Level:
All

Language:
VAX-11 MACRO

Operating System:
VAX/VMS

Developed By:
Madison
Academic Computing Center
University of Wisconsin
1210 West Dayton Street
Madison, Wisconsin 53706

Availability:
Contact developer directly at above address or telephone: (608) 262-3095.
Application: Networks/Communications

UT200BOX

Description:
UT200BOX™ is a communication interface system built around a small scale PDP-11 processor. It provides a common communication channel between CDC mainframes and Digital’s VAX-11/VMS and PDP-11 RSTS/E (CTS-500) systems.

All communications protocol overhead, including longitudinal, lateral parity checking, code translation (ANSI, BCD) to ASCII, polling receipt and reply, printer record decompression and transmission line error recovery, is handled in the front-end processor, not by your host computer system. This provides appreciably less overhead on the VAX or RSTS host.

UT200BOX communicates via CDC’s User Terminal 200 protocol, mode 4A. It can communicate with CDC 6000 or CYBER series mainframes which provide the INTERCOM or IMPORT/EXPORT communications packages.

Submission to the CDC mainframe is controlled by a shared transmission queue. Digital users who wish to submit jobs simply state to a queuing program the files they wish transmitted.

Any Digital user’s CDC output from the CDC host may be routed back directly into a user’s disk account on the Digital System or to a common print queue.

Operators on the Digital system can submit console commands and execute operator functions on the CDC mainframe.

Multiple RSTS/E or VAX/VMS user’s share one UT200 port to the CDC host resulting in less CDC mainframe and communications overhead.

A lineprinter may be attached directly to the UT200BOX front end CPU. This eliminates host overhead when printing output from the CDC system.

Operation is selectable between ASCII or BCD.

The protocol supports communication over a single switched or unswitched two-wire or four-wire communication carrier facilities at speeds from 2,000 to 19,200 bits per second (BPS).

A disk log file is kept of all transfers made by the UT200 BOX system, providing full audit control. Transmission line usage, user information and CDC system turnaround statistics can be extracted from this log.
Up to eight UT200BOXes may be placed on one VAX/VMS or RSTS/E system. The UT200BOX front-end CPU is assembled entirely from standard Digital components and is fully maintainable by Digital field service.

Features
- Direction of output
- Shared usage of a single UT200 by multiple users.
- Direct connection of a lineprinter.

Minimum Education Level:
College or University

Operating System:
VAX/VMS, RSTS/E

Developed By:
Software Results Corporation
1229 West Third Avenue
Columbus, Ohio 43212

Availability:
Contact Jim Ebright, Director of Marketing, at Software Results Corp., or telephone: (614) 421-2094.
Application: System Utilities

ACCRPT, ALPCAT, FIRST

Description:
ACCRPT, is a utility designed to analyze and report the contents of a user specified job accounting log file. These reports include the projects total connect and CPU time, the average connect and CPU time of the accounts under the project, the number of accounts under that project, and an optional listing of the accounts under project.

ALPCAT is a program that will organize files alphabetically in a user account. The program will preserve: Run-time Systems, File Attributes, Protection Codes, Contiguous Files, Last Access Date, Creation Date, and Creation Time.

FIRST is a utility that will copy files within a directory. File statistics such as Creation Date, Time, Last Access Date, and Run-time System can be preserved. However, the file will always be created first on the directory.

Minimum Education Level:
All

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
DELTA EDUCATIONAL COMPUTING SYSTEMS
University of Delaware
College of Education
Newark, Delaware 19711

Availability:
Contact developer directly at the above address or telephone: (302) 738-2160.
BASIC—DARTMOUTH BASIC TO BASIC-PLUS TEXT EDITOR

Description:
This program makes a program written in Dartmouth BASIC runnable on a system that uses BASIC-PLUS. Some programs are not totally interchangeable, and appropriate warnings are printed during a run of the program. The user can, in most cases, replace Dartmouth functions which have no BASIC-PLUS equivalent by a few lines of coding or a user-defined function.

Minimum Education Level:
Secondary

Language:
BASIC-PLUS

Operating System:
RSTS/E

Developed By:
Adam Schneider and Bruce White
Cedarhurst, New York

Availability:
DECUS (to members only)
Order #RSTS11-92
BSO/ICECNV INTEL SYMBOLIC FORMAT CONVERSION

Description:
The ICECNV program reformats BSO symbolic format to Intel symbolic format. It permits Intel MDS users to use a PDP-11 or DECsystem-10 to generate and test microprocessor programs on a fast, multi-user system. Using CY/MICRO and SI/MICRO, programs can be assembled and symbolically debugged. When all software problems are corrected, the final program, with symbolic information, can be transmitted to an Intel emulator for in-circuit testing.

Minimum Education Level:
All

Language:

Operating System:
VAX/VMS, RSTS/E, RSX-11

Developed By:
SimonWieczner
Boston Systems Office, Inc.
469 Moody St.
Waltham, MA 02154

Availability:
Contact developer at the above address or telephone: (617) 894-7800.
BSO/OBJCNV FORMAT CONVERSION PROGRAM

Description:
The OBJCNV set of programs permits the microprocessor system developer to convert programs in one microprocessor object format to another, regardless of manufacturer. Programs can be converted back and forth between BSO format and Intel, Motorola, Texas Instruments, Tektronix, Millennium, Zilog, or other formats.

The program supports Intel symbolic object format through an auxiliary program called ICECNV. Tektronix 8001/8002 MDL up-line/down-line loading is also supported. A Digital computer user can therefore develop programs for any microprocessor on a fast, single or multi-user DECsystem. Then the program can be readily transmitted, in the proper format, to the test board, emulator (ICE) or PROM programmer.

Minimum Education Level:
All

Language:
MACRO-11

Operating System:
VAX/VMS, RSTS/E, RSX-11M

Developed By:
Simon Wieczner
Boston Systems Office, Inc.
469 Moody St.
Waltham, MA 01254

Availability:
Contact developer at the above address or telephone: (617) 894-7800.
BSO/PASCAL MICROPROCESSOR COMPILER

Description:
PASCAL is the first cross-compiler ever introduced that was specifically designed for microprocessor software development. The product permits fast program creation and the adept handling of specialized microprocessor hardware/software interfacing. In addition, the unique typechecking capabilities of PASCAL permit the generation of near error-free source code. Of utmost significance, the source language program once completed for one microprocessor, can then be recompiled with the proper PASCAL modules to generate object code for any one of a number of other supported target microprocessors. By using a more powerful machine than a microprocessor, PASCAL is independent of any microprocessor and lets the purchaser take advantage of the higher speed, larger memory, more powerful editors and multiuser capability of the host computer.

Features:
- Multiple microprocessor support of source programs.
- Strong type checking results in extremely accurate programs.
- Exclusive interrupt handling instructions and file variables for specified I/O.
- Separate compilation of individual program modules.
- User-defined variable types optional.
- Optimization switches in compiler for user-specified memory versus speed tradeoff.
- Assembly language output for optional manual optimization.
- Extensive automatic optimization including microprocessor specific optimization.
- Extensive compiler generated comments.
- Can link source programs in Assembler and PASCAL.

Minimum Education Level:
All

Language:
PASCAL

Operating System:
VAX/VMS, RSX-11M
Developed By:
Simon Wieczner
Boston Systems Office, Inc.
469 Moody Street
Waltham, MA 02154

Availability:
Contact developer at the above address or telephone: (617) 894-7800.
CA/MICRO MICROPROCESSOR CROSS ASSEMBLERS

Description:
The CA/MICRO series of high-speed cross assemblers satisfies the need for rapid generation of machine code for microprocessors. By using a more powerful machine than the microprocessor itself, the programmer can take advantage of the higher speed, larger memory, more powerful editing capability, and high-speed peripherals of the host computer. This approach also permits simultaneous software development by many programmers. Input to the cross assembler is manufacturer standard assembly language. The cross assembler itself is written in host computer assembly language.

Features:
- Instruction set is the same as documented in the manufacturer's literature.
- Conditional assembly instructions allow generation of several versions of the same program from a single source file.
- Relocating Cross Assembler. The relocating cross assembler permits the generation of object files for individual program modules with subsequent linking of these into one absolute object file. The linking of relocatable object file is accomplished by a cross-linkage editor.
- A cross-reference listing is also available as an option.
- Microprocessor supported include Intel 8048 series, 8080/5, 8051, 8086, 8088, Motorola 6800, 6801, 6802, 6805, 6809, 68000 Zilog Z80, Z8000, TI 1000, 9900 series, RCA 1802 series National, Rockwell, Mostek and others.

Minimum Education Level:
All

Language:
MACRO-11

Operating System:
VAX/VMS, RSTS/E, RSX-11M

Developed By:
Simon Wieczner
Boston Systems Office, Inc.
469 Moody St.
Waltham, MA 02154
Availability:
Contact developer at the above address or telephone: (617) 894-7800.
Application: System Utilities

CL/MICRO MICROPROCESSOR CROSS-LINKAGE EDITORS

Description:
The Cross-Linkage Editors link the object files of any number of program modules together to generate a single object file. The input files may be either absolute or relocatable files, library files, or any combination of these.

The Cross-Linkage Editors have the following features:
- They allow the user to segment program sections into both ROM and RAM address areas.
- They allow for base sector segments.
- Support 32 bit addressing and expression evaluation.
- They produce a load map indicating the load addresses of the program sections and global variables and flag undefined and multiply-defined segments and globals.
- They can read libraries of commonly used program subroutines (either absolute or relocatable) which may be individually retrieved for inclusion in the output file via calls in the input modules. Uses of subroutine libraries saves programming time, enforces standardization and ensures victory.
- They have the ability to resolve relocatable expressions of arbitrary complexity passed on by a relocating cross assembler.

Minimum Education Level:
All

Language:
MACRO-11

Operating System:
VAX/VMS, RSTS/E, RSX-11M

Developed By:
Simon Wieczner
Boston Systems Office, Inc.
469 Moody St.
Waltham, MA 02154

Availability:
Contact developer at the above address or telephone: (617) 894-7800.
CY/MICRO MICROPROCESSOR RELOCATING CROSS ASSEMBLERS

Description:
Relocating Cross Assemblers permits the generation of object files for individual program modules with subsequent linking of these modules into one absolute object file. The linking of relocatable object files may be accomplished by a Cross-Linkage Editor.

The Relocating Cross Assemblers have the following features:
• RAM/PROM Segmenting — By use of the proper directives, program and data sections can be assigned or relocated to either RAM or PROM address areas. The user may specify as many separate, named program sections in the program as is desired. Base addresses for each one can be specified at either assembly or linking time.
• Absolute Assembler Included — The relocatable assembler package includes a standard absolute at no extra charge. The absolute assembler has all of the advanced features of the relocatable assembler except for those features specifically associated with relocation. The absolute version of the assembler produces absolute code in the manufacturer’s format, and no linkage editor is required.
• Absolute Code Permitted — Data or program sections to be loaded into absolute memory areas may be mixed in with relocatable code.
• Relocatable Expressions — When used with cross-linkage editors the relocating assembler can accept arbitrarily complex symbols and constants. These expressions are passed on to the linkage editor which resolves them at linkage time.
• Microprocessors supported include Intel 8048 series, 8080/5, 8051, 8086, 8088, Motorola 6800, 6801, 6802, 6805, 6809, 68000 Zilog Z80, Z8000, TI 1000, 9900 series, RCA 1802 series, National, Rockwell, Mostek and others.

Minimum Education Level:
All

Language:
MACRO-11

Operating System:
VAX/VMS, RSTS/E, RSX-11M
Developed By:
Simon Wieczner
Boston Systems Office, Inc.
469 Moody St.
Waltham, MA 02154

Availability:
Contact developer at the above address or telephone: (617) 894-7800.
Application: System Utilities

DREAMS: AN ELECTRONIC MAIL SYSTEM

Description:
There have been several recent articles on electronic mail systems in Computer World and in the industry magazines. DREAMS, however, is not a recent development, but rather the culmination of several years of development. An early system which was implemented for the DECSYSTEM-10 was presented at the Fall 1975 DECUS Symposium and is included in the Proceedings. This low-cost system has many features found in popular (expensive) electronic mail systems.

Significant features of DREAMS Version 4.0 include the following:

- Auxiliary mail files which can be dynamically defined by the user as he reads from his primary mail file. He may organize his auxiliary mail files to suit his needs, e.g., by sender or by subject. Dates are always maintained for selective retrieval. Auxiliary mail files are described throughout the report.

- Group names may be user-defined for ease in sending messages to groups or recipients. The user may also define default switches to influence his use of DREAMS.

- Messages may be prepared with a text editor or word processing system, then referenced as part of the message or as the entire message to be sent.

- Compatibility with BATCH. Often it is convenient for a batch job to send a message confirming its progress. DREAMS will adapt to situations where the receiver's mail file is temporarily busy. Similarly, attempts by multiple users to access the sender's mail file are handled gracefully.

- One can distinguish between "new" mail and "old" mail. Thus, a user can read his new mail, that which has never before been presented to him, and skip over his old mail.

- There are a large number of switches and options which provide great flexibility. Nevertheless, the occasional user can use DREAMS very effectively with a minimum of commands.

Language:
BASIC-PLUS

Operating System:
RSTS/E
Developed By:
DCXX Software Services
Dickinson College Computer Center
Carlisle, Pennsylvania 17013

Availability:
Contact the developer directly.

For More Information:
A free report describing all of the options and features is available from Tom Burtnett, Dickinson College Computer Center, Carlisle, Pennsylvania 17013.
Application: System Utilities

DX (DOCUMENT EXCHANGE UTILITY)

Description:
Document Exchange Utility (DX) is a software package that executes on a multitasking operating system. It enables a WS78 Word Processing System running WPS-8 or WPS-8/MTS software to communicate with the host system over an asynchronous terminal interface. The WS78 system appears to the host to be a normal terminal. Communication between the WS78 system and the host system uses the DX error-correcting message protocol. DX thus effectively enables distributed standalone WS78 systems and the host operating system to be linked together for better system utilization and data sharing. The DX package includes utility programs that convert host system files stored in word processing format to host system files stored in unformatted ASCII format and vice versa.

DX enables the WS78 system user to:

- Store word processing format files on the host system and later retrieve them. The ability to access IAS structures enables the WS78 system user to store large numbers of documents otherwise filling several document diskettes including large documents filling an entire diskette on one disk structure.

- Use the high-speed lineprinter connected to the host system to print documents which do not require letter quality printing, such as rough drafts. This increases system throughput and increases the availability of the WS78 letter quality printer for printing final drafts. Conversely, the host system user can output text files converted from the host file system on the WS78 letter quality printer.

- Create host system source language and data files off-line from the host system using the WS78 editor, and then transmit the files to the host system for processing.

Minimum Education Level:
All

Language:
BASIC-PLUS, FORTRAN, and BASIC-PLUS-2

Operating System:
RSTS/E and VAX/VMS

Developed By:
Digital Equipment Corporation
Availability:
Digital's Software Distribution Center. Contact your local DIGITAL office.
LAWRENCE RUNOFF

Description:
Lawrence RUNOFF is a flexible text and document formatting program providing high speed (65 pages/min) and low overhead (7-9KW under RSTS/E). Distinctive features include: centered of left/right alternation of page numbering; flexible positioning of title and subtitle on each page; automatic computation of footnote size; positioning of footnotes either page-by-page or as list of references; indexing (phrases stored uniquely); hyphenation as a run-time option; and programmed justification via microspacing with Diablo-type terminals. Coupled with high speed, the capacity for printing only a limited range of pages specified at run-time facilitates the preparation of long documents. A software “kit” supplied with the program permits local tailoring of Lawrence RUNOFF for specialized output devices. Lawrence RUNOFF is fully documented, both for the user and for the system manager.

Minimum Education Level:
Secondary School

Language:
MACRO-11

Operating System:
RSTS/E

Developed By:
Dr. James S. Evans
Lawrence University
Appleton, Wisconsin

Availability:
Contact:
Computer Center Publications
Lawrence University, Box 599
Appleton, Wisconsin 54912
(414) 735-6570
PACS PROCESS ACCOUNTING AND CHARGEBACK SYSTEM

Description:
PACS is a software system for billing users, reporting job costs and monitoring system utilization on VAX-11 computers. PACS automatically collects and organizes disk storage and process accounting information. It provides itemized month-to-date bills online, upon the user's request. Financial reports, including the final billing, are generated upon the request of the system manager or other authorized user.

Chargeback Billing: PACS bills report the quantity used, unit cost, and expenditure for each of 12 or more billable resources. The billable resources include disk storage, connect time, CPU time, file input-output operations, etc. Additional billable resources may be defined by the system manager. Each account may have a different billing algorithm. PACS supports non-prime time charge periods, discounts for large quantity usage, adjustments, fixed periodic charges, minimum charges and other exceptional billing rules. The billing procedure also generates a data file for automatically entering chargeback billing data into a general accounting system.

Job Cost Reporting: PACS financial reports break out expense and income by account and by computer resource. This system meets the needs of government, commercial or in-house job cost reporting.

System Utilization Monitoring: PACS generates daily and monthly system utilization statistics. A month-to-date record is kept of the use of each of 12 system resources, itemized by hour of the day.

Installation: Extensive system documentation and installation notes are provided with PACS. A parameter file enables easy tailoring to specific hardware configurations. Fast, error-free installation of PACS is aided by indirect command files which are supplied with the system.

Minimum Education Level:
All

Language:
FORTRAN, MACRO

Operating System:
VAX/VMS
Developed By:
Signal Technology, Inc.
15 West De La Guerra St.
Santa Barbara, California 93101

Availability:
Contact developer directly at the above address or telephone: (805) 963-1552 or (800) 235-5787.
RABBIT-1 COMPUTER RESOURCE, ACCOUNTING AND BILLING

Description:
RABBIT-1 is a general purpose system for auditing, accounting and allocating computer usage from the computer center to individual users, groups of users or customers. These may represent real accounts receivable, as in the case of a service bureau, or may be for budgeting and cross-charging in-house system resource consumption.

RABBIT-1 will accurately accumulate and distribute all system usage. This includes not only CPU utilization but DISK, IO, Printing, Tape Storage, Equipment Rental, Manuals, Communication Costs, and Programming Services.

A secondary purpose served by RABBIT-1 is to maximize the usage of the computer facility by encouraging users to distribute their utilization across as much machine availability as possible. Multi-level discounting facilities encourage the shifting of computer demand of off-prime time for more throughput at no additional costs.

FEATURES AND CAPABILITIES
RABBIT-1 provides the system tools to meet the computer resource accounting needs of the user, system manager, project manager, budget manager, accounting department and operational management. Invoicing, cross-charge, project accounting, user budgeting, tape and disk accounting are just a few capabilities.

RABBIT-1 powerful report generator provides summaries, subtotals, recaps and cross-footing to assure accounting control of job data. Furthermore, reports may be tailored to the needs of the recipient.

RABBIT-1 automatically generates session-by-session user reports showing consumption of CPU, connect, I/O, mounts: plus printing reports, disk file reports and tape reports.

RABBIT-1 internal calendar provides infinite weekend, weekday, time-of-day and holiday discounts to meet invoicing needs. “Customer” files provide additional variations for cross charging and billing activities.

Minimum Education Level:
All

Language:
FORTRAN
Operating System:
RSTS/E and VAX/VMS

Developed By:
RAXCO, Inc.
3336 N. Flagler Drive
West Palm Beach, Florida 33407

Availability:
Contact developer directly at above address or telephone: (305) 842-2115.
Application: System Utilities

RABBIT-2 SYSTEM PERFORMANCE ANALYSIS

Description:
RABBIT-2 provides a graphic representation of your CPU consumption, hour by hour, day by day. Or it will present your average daily consumption of all resources. Superimpose your average user over your remaining resources to quickly project the number of new users allowed before your computer resources are exhausted.

These "performance pictures" make it easy to spot recurring problems, such as I/O congestion or excessive CPU demand. To further examine the problem just type "WHO" with the designated time interval and obtain a list of users that were on the system. One may then examine the users in detail and research their activities.

RABBIT-2 gives the user the tool to improve system performance. It identifies bottlenecks, quantifies system component usage, determines peripherals utilization. It will even project future computer requirements. In short, it will provide the information to professionally manage the computer facility in all environments, including timesharing, batch, dedicated, general purpose and multi-user systems.

Minimum Education Level:
All

Language:
FORTRAN

Operating System:
VAX/VMS and RSTS/E Version 7.0+

Developed By:
RAXCO Inc.
3336 N. Flagler Drive
West Palm Beach, Florida 33407

Availability:
Contact developer directly at above address or telephone: (305) 842-2115.
RABBIT-3 JOB ACCOUNTING AND PERFORMANCE MONITORING

Description:
RABBIT-3 is a complete performance monitoring and job accounting system designed especially for PDP-11 RSTS/E Version 7 users. Designed as a standalone system, RABBIT-3 is written entirely in PDP macro assembler for maximum operating efficiency. Fast and small, RABBIT-3 runs in 5K memory with only a one percent (approximate) system degradation depending on the sampling rate.

RABBIT-3 is flexible and easy to use. It's also easy to install. After loading the RABBIT-3 tape or disk, just answer a few questions to tailor the system to your needs.

Available Options:
Auto-crash Recovery
...automatic restart from system crashes.

Daily Disk Catalog
...generates disk accounting information for each user.

Security Tracer Record
...provides step by step security information of user activities.

Disk Critical Alert
...alerts operator that free disk is below efficient levels.

Minimum Education Level:
All

Language:
MACRO

Operating System:
RSTS/E Version 7

Developed By:
RAXCO, Inc.
3336 N. Flagler Drive
West Palm Beach, Florida 33407

Availability:
Contact developer directly at above address or telephone: (305) 842-2115.
RABBIT-4 SECURITY SYSTEM FOR DATA FILES

Description:
RABBIT-4 is a standalone data file security system that operates under RSTS/E Version 7. RABBIT-4 prevents access to classified or confidential data files by unauthorized personnel. Even privileged users may be excluded from data files secured by RABBIT-4. Coupled with normal security measures, RABBIT-4 will ensure file integrity while monitoring all file access attempts.

RABBIT-4 "locks-up" designated data files from would-be intruders. All attempted file violations are logged and available for analysis. Computer operations and security management may be immediately notified of the file violation attempt, and the offending job rolled out or stopped. Under RABBIT-4 maximum security, the RSTS/E operating system may be disabled until the intrusion is cleared.

RABBIT-4 provides up to six levels of security on a present maximum of 64 data files. Access to each secured data file is restricted only to authorized users through file access definition tables. Up to 32 wildcard notations define the authorized users for each secured file. Access authorization may also be restricted to limited programs to ensure file integrity.

RABBIT-4 creates and maintains a complete log of file access and violation attempts. Included in the log is: date, time, job, program, project-programmer and keyboard. The log of file accesses is available at all times to assigned security management. A recap report of violations and access attempts may be run at will.

RABBIT-4 is written in PDP-11 MACRO to ensure optimized performance. The logged data is in ASCII stream format for prompt reporting. RABBIT-4 is controllable through OPSER and has an optional system crash recovery capability.

Minimum Education Level:
All

Language:
MACRO

Operating System:
RSTS/E Version 7
Developed By:
Raxco Inc.
3336 N. Flagler Drive
West Palm Beach, Florida 33407

Availability:
Contact developer directly at above address or telephone: (305) 842-2115.
Application: System Utilities

RSTS USER'S GUIDE AND EDT/RNO MANUAL

Description:
A 180-page introduction to RSTS and programming in "standard" BASIC and an 80-page primer for EDT and RNO are provided on 9-track, 800 bpi magtape in RNO.TSK format. This permits a site to produce a locally tailored manual for users with a minimum of effort. Neither manual is intended to replace DIGITAL-supplied manuals; rather, it offers the fundamentals needed to use the computer for first-time users. The RSTS user's guide has been used successfully in a four-week intensive course on programming in BASIC. The EDT/RNO manual has been used successfully by people with no previous computer experience to prepare lengthy manuscripts on the computer. The tape also contains a "spelling corrector" and 32,000+ word file for assisting in proofreading written material.

Minimum Education Level:
Secondary

Language:
Files require the RNO.TSK program. The spelling corrector is written in EXTEND-mode BASIC-PLUS (Version 6C or later).

Operating System:
RSTS/E

Developed By:
Middlebury College
Middlebury, Vermont 05753
(802) 388-7976

Availability:
Provided on 600 ft., 9-track, 800 bpi tape for $100. The material is copyrighted in such a way that modifications and re-publication are permitted, as long as no profit is made from resale and suitable acknowledgement is given to the original title and authors.

339
SI/MICRO MICROPROCESSOR INTEGRATED SYMBOLIC SIMULATOR DEBUGGERS

Description:
These symbolic simulator debuggers are powerful programming tools which can be used to debug microprocessor software. They allow the user to take full advantage of a larger computer, thereby significantly reducing the number of hours spent in program development.

Features include:
- User Configured Virtual Microprocessor System
- Unlimited Trace/Break Conditions and Data Storage
- Full Memory Simulation
- Extensive Simulation Control
- I/O Simulation and Debugging
- Interrupt Simulation and Debugging
- Extensive Debugging Facilities
- Built in Program Loader

A simulator debugger consists of three discrete systems as described below:

Loader — Loads standard format object code and reads symbols from a listing file produced by the cross assembler.

Simulator — A program that simulates the operation of a virtual microprocessor system.

Debugger — A symbolic debugger “invisible” to the simulated microprocess. It allows the user to examine and modify interactively the program in an absolute and/or symbolic mode.

Minimum Education Level:
All

Language:
MACRO-11

Operating System:
VAX/VMS, RSTS/E, RSX-11M

Developed By:
Simon Wieczner
Boston Systems Office, Inc.
469 Moody St.
Waltham, MA 02154

Availability:
Contact developer at the above address or telephone: (617) 894-7800.
Application: System Utilities

1401 SIMULATOR

Description:
The 1401 (S1401) runs 1401 programs on the PDP-11. The simulator is designed to minimize the effort for conversion from a disk 1401 system to a PDP-11 system.

The maximum 1401 machine configuration that S1401 can simulate is: 16K 1401 with sense switches B-G, high-low-equal compare, indexing, modify address, store A and B address registers, move characters to record-mark or group-mark-word-mark, scan disk and direct seek, 1402 card reader/punch, 1403 lineprinter, 1407 console inquiry station, and up to five 1311 disk drives.

The following 1401 special features are not implemented in S1401:
1. Hardware multiply-divide
2. Branch if Bit Equal instruction
3. Move and Insert Zeros instruction
4. Start Read Feed instruction
5. Start Punch Feed instruction
6. 1311 disk track — Record instructions
7. Magtape

Minimum Education Level:
All

Language:
MACRO-11

Operating System:
20K PDP-11/20, CR11 card reader, LP11 lineprinter, up to 7 TC11 DECTape drives, up to 5 RK11 disk drives (RKs must equal number of 1311s), and optional PC11 paper tape reader/punch.

Developed By:
Edward Geigler
Carleton College
Northfield, Minnesota 55057

Availability:
DECUS (to members only)
Order #11-161
1401 SIMULATOR (RSTS/E VERSION)

Description:
The 1401 Simulator (S1401) runs 1401 programs on the PDP-11 RSTS system. It requires 18K of memory in addition to the requirements of RSTS and BASIC-PLUS. Of this 18K, 6K is used by the S1401 run-time system, and the other 12K is user area. When multiple S1401 jobs are running, the run-time system is shared by all jobs. The user areas are swapped in and out by RSTS, but the run-time system remains in memory as long as any RSTS job is using it.

Minimum Education Level:
All

Language:
PAL-11

Operating System:
RSTS/E Version 5B-24 or later

Developed By:
Edward R. Giegler
Carleton College
Northfield, Minnesota 55057

Availability:
DECUS (to members only)
Order #RSTS11-72
Application: System Utilities

SOS-11 EDITING SYSTEM

Description:
SOS-11 is an easy-to-use but powerful line-oriented editing system, available on the RSTS/E V6B operating system. It supports all the features of the PDP-10 program by the same name, and is operated in an almost identical manner.

SOS organizes the file into lines and pages, which can be referenced either by a line/page number or by textual content. Most commands operate on lines as single units, and one command (ALTER) includes a very powerful character-oriented editing subsystem.

SOS operates on stream ASCII (BASIC-PLUS) files and RMS record formatted files, either type with or without sequence numbers.

Minimum Education Level:
All

Language:
BLISS-11

Operating System:
RSTS/E Version 6B or later

Developed By:
William T. Marshall, Digital Equipment Corporation

Availability:
DECUS (to members only)
Order #RSTS11-108
WIDJET: WATERLOO INTERACTIVE DEBUGGING JOB ENTRY TERMINAL SYSTEM

Description:
The WIDJET system is a job-preparation and debugging system specifically designed to help the student or novice programmer prepare and run programs on the computer. It consists of a simple-to-use editor which can be used to enter and correct programs via CRT terminals. When a program has been entered it can be run locally on the PDP-11 using the WATBOL-11 and WATFOR-11 compilers or it can be submitted to an IBM machine via a BISYNC line (RSX-11D only). Once a program has been run the user can examine his output at the CRT, make corrections if necessary, and resubmit the job for execution.

The WIDJET system is currently being used at the University of Waterloo with 120 terminals for classes totaling 2500 students writing COBOL and FORTRAN programs.

Minimum Education Level:
Secondary

Language:
MACRO-11

Operating System:
RSTS/E

Developed By:
Computer Systems Group, University of Waterloo, Waterloo, Ontario, Canada

Availability:
Computer Systems Group
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1

For More Information:
Contact Sandra Ward at the above address or by calling (519) 885-1211, extension 3268.
XPACK

Description:
XPACK is a software development tool kit intended for RSTS/E users. With XPACK the user can cut the software development and maintenance time significantly while improving the software quality.

The package contains a set of programs and a document set. This document sets excellent standards and procedures for software development and release under RSTS/E. XPACK documentation also contains important information about the languages as well as programming hints and optimization techniques.

XPACK is directly aimed at:
1. Improving throughput of new applications development.
2. Reducing required maintenance.
4. Facilitating for easier and speedy conversions.

Minimum Education Level:
All

Language:
BASIC-PLUS, BASIC-PLUS-2, XPRESS

Operating System:
RSTS/E

Developed By:
MBA (Micro-Base Assoc. Inc.)
3477 E. Livingston Ave.
Columbus, Ohio 43227

Availability:
Contact developer directly at above address or telephone: (614) 231-2130.
APPENDIX A

PROGRAM DEVELOPMENT AND TRANSFER

The techniques and standards used to develop transportable applications programs are issues of concern to users and vendors alike. The cost of software and the diversity of machines and architectures make high level language transportability the key to applications' being widely available. Digital Equipment Corporation supports the efforts currently going on in the industry in the area of standardization. The efforts of CONDUIT (The University of Iowa), a research and development group, are an example of such efforts.

CONDUIT has prepared a series of reports and guidelines for the development of computer-based materials which (1) describe techniques and standards for facilitating the transfer of materials; (2) present tested practices for all who are interested in program transfer; and (3) serve as the basis for standards used in developing materials for the CONDUIT library.

The following reports are available from CONDUIT, and readers are urged to order copies if they are interested in preparing transferable programs.

To order these reports, write directly to:
CONDUIT
P.O. Box 388
Iowa City, Iowa 52244
(319) 353-5789

CONDUIT AUTHOR'S Guide
($10.00 U.S. prepaid)

CONDUIT BASIC Guide
($10.00 U.S. prepaid)

CONDUIT FORTRAN Series
($3.00 U.S. prepaid)

PIPELINE Magazine
($15.00 subscription U.S. prepaid)
GENERAL COMMENTS:
In dealing with transporting (converting) applications from one ma-
chine to another, the user needs to consider several things:
• the language used and its dialect
• the implementation of the language on a particular machine
• data file formats and structures
• machine limitations
The following general statements should be considered by those
interested in the conversion or transfer of packages currently listed in
the IDEAS book.
MACRO Programs: Programs written in MACRO will almost always
need to be rewritten. At the very least, they will need to be examined,
tested, and verified by the user. It will often be possible to use the logic
of the MACRO program, but the actual code will need modification. In
most cases, the MACRO portions are a relatively small percentage of
the applications program.
FORTRAN Programs: Programs written in ANSI Standard FORTRAN
should move relatively easily. The user will have to be careful of any
program which depends on extensions to the ANSI Standard on either
system. A call to the developer is generally the quickest way to esta-
blish FORTRAN transportability. In particular, moving to VAX FOR-
TRAN should be straightforward because of the VAX machine’s large
address space and wider words. Some areas that may require inspec-
tion will be:
• data files, specifically binary or random-access files
• programs where data has been EQUIVALENCED
• programs which store character data in arithmetic variables
• any other programs which depend on the physical characteristics of
  the machine on which they are running, for example, time depen-
dents and internal data representations
BASIC Programs: One of the primary areas of interest has been
transportability of BASIC-PLUS to BASIC-PLUS-2. The following
should be noted regarding this issue:
BASIC-PLUS-2 is supplied from DIGITAL with a translator to carry out
those modifications which can be done mechanically. The translator
also flags items which it cannot translate or which may have logically
different meanings in BASIC-PLUS-2. We refer the potential user to
the discussion of translation issues in the BASIC-PLUS-2 User’s
Guide* for a more complete discussion of the translator and its capa-
abilities.
In general, most applications programs will move with some simple modification. Those BASIC-PLUS programs which are heavily dependent on the features of RSTS/E (as opposed to BASIC-PLUS itself) will be more difficult to move.

In particular, the user should be careful with:

- data files, particularly those that do record I/O
- programs which make use of RSTS services via SYS functions
- programs which may perform actions that are undefined even in the original language (such as transfers into FOR loops)
- programs which are dependent on the internal storage techniques of the source system

Again, we would suggest that a call to the developer can often save a great deal of time for the user wishing to transfer a large application system.

To aid in this transportability issue, we will attempt to obtain more detailed information from the individual developers on the transferability of their programs for publication in future editions.

* Order BASIC-PLUS-2 User's Guide, Part No. AA-0157A-TC, through your local DIGITAL sales office or directly from the Technical Documentation Center nearest you, listed below:

Western Region:
Technical Documentation Center
2525 Augustine Drive
Santa Clara, California 95051
(408) 984-0200

Central Region:
Technical Documentation Center
1050 East Remington Road
Schaumburg, Illinois 60195
(312) 640-5612

Northeast and Mid-Atlantic Regions:
Technical Documentation Center
Cotton Road
Nashua, New Hampshire 03060
(800) 258-1710
New Hampshire Residents: 603-884-6660

349
APPENDIX B

ADDITIONAL SOFTWARE REFERENCES

Several product lines within DIGITAL publish their own indexes of applicaton software, and some of their packages may be applicable to your installation. In addition, various organizations outside of DIGITAL have authored publications which list available software for educational use. Information on these resources is offered here for your consideration.

Available from DIGITAL

• Engineering Software Referral Catalog
  This catalog lists available software packages for the VAX-11/780, PDP-11, DECSYSTEM-10, and DECSYSTEM-20 families of computers. Discipline areas listed include structural/mechanical/civil engineering, electrical/electronics design, management and control systems, graphics, statistics, simulation/operations research, and text processing.

  To order, write directly to:
  Software Referral Catalog
  Engineering Systems Group
  MR1-1/M75
  Digital Equipment Corporation
  200 Forest Street
  Marlboro, MA 01752

• AIP — Commercial Application Interchange Program
  This catalog lists available software for DIGITAL's DEC Datasystems (Commercial PDP-11 systems). Discipline areas listed include general business, communication, construction, distribution, finance, government, insurance, manufacturing, real estate, retail, transportation, and utilities.

  To order, write directly to:
  AIP Coordinator
  Digital Equipment Corporation
  MK1-2/H32
  Merrimack, NH 03054
• **LDP — Research Application Catalog**

This catalog provides sources of application software and systems that will help Digital customers implement their scientific computing systems more timely. The software listed runs on PDP-11, VAX, DECsystem-10 and DECSYSTEM-20 families of computers.

To order, write directly to:

LDP Research Application Catalog  
MR2-4/M38  
Digital Equipment Corporation  
One Iron Way  
Marlboro, MA 01752

**Additional Educational References**

• **CONDUIT Reviewed and Tested Materials**

Curriculum materials are available in the areas of biology, chemistry, education, geography, economics, English, languages, management, mathematics, physics, political science, psychology, sociology, and statistics. For more information, write directly to:

CONDUIT Ed. Media Specialist  
P.O. Box 388  
Iowa City, Iowa 52244  
(319) 353-5789

• **Computer Programs That Work**

This resource lists available programs under the major headings of mathematics, science, and games. For more information, contact:

Sigma Technical Press  
23 Dippons Mill Close  
Tellenhall, Wolverhampton  
WV16 8HH  
West Midlands, England

• **Engineering Science (CAL) Program Exchange**

Included are simulations of engineering systems for higher education students in electrical and electronic, mechanical, nuclear and aeronautical engineering. Many of the programs were originally developed on a PDP-11 with Tektronix graphics terminals. For further information write to:

Engineering Science (CAL) Program Exchange  
Faculty of Engineering  
Queen Mary College  
Mile End Road  
London E1 4NS
• England Computers in the Undergraduate Science Curriculum

Included are FORTRAN and BASIC programs for physics, chemistry, biology and physiology. An information booklet and further information is available from:

Educational Computing Section
Chelsea College
University of London
Pulten Place
London SW6 5PR

• England Geographic Association Package Exchange (GAPE)

This publication includes a set of tried and tested programs, mostly in FORTRAN and BASIC, designed to help geography teachers use the computer as a resource for more effective geography teaching. The scheme is run from Loughborough University under the auspices of the Geography Association. For further information contact:

David Walker
Director GAPE
Department of Geography
Loughborough University of Technology
Loughborough LE11 3TU
DECUS MEMBER INFORMATION FORM

Membership in DECUS is voluntary and is not subject to a membership fee. Members are invited to take an active interest in the society by contributing to the Program Library, to DECUSCOPE, and by participating in its Special User Groups and symposia. There are two types of membership: Installation Membership and Associate Membership.

Installation
An organization, institution, or individual that has purchased, leased, or has an order for a computer manufactured by Digital Equipment Corporation is eligible for Installation Membership in DECUS. Membership status is acquired by submitting a written application to the appropriate Chapter Executive Secretary for approval by the Chapter Executive Board.

On acceptance of application for membership, literature covering numerous DECUS services is sent to the Installation Delegate for reference and aid in maintaining active participation in the Society.

Associate
Any person who is not an appointed Installation Delegate, who has a bona fide interest in DECUS is eligible for Associate Membership.

Associate Members receive DECUSCOPE, the Society's Newsletter, automatically. They may receive other DECUS material on request. Written application indicating desire to join must be submitted to the appropriate Chapter Executive Secretary for approval by the Chapter Executive Board.

On acceptance of the application for membership, literature covering the numerous DECUS services is sent to the member for reference and to enable active participation in the Society.
To receive membership information, fill out the form below and mail to the DECUS office nearest you.

Please send me more information concerning the activities and membership requirements of DECUS.

NAME

SCHOOL or UNIVERSITY

ADDRESS

CITY STATE ZIP

Membership Request

Installation
Associate

DECUS OFFICE

DECUS Australia
P.O. Box 491
Crows Nest, New South Wales 2065
Australia

DECUS Canada
P.O. Box 11500
Ottawa, Ontario K2H 8K8
Canada

DECUS Europe
C.P. 510
12, avenue des Morgines
CH-1213 Petit-Lancy 1,
Geneva, Switzerland

DECUS U.S. and Office of the Executive Director
One Iron Way
Marlboro, Massachusetts 01752
USA
READER'S COMMENT FORM: IDEAS BOOK — FOURTH EDITION
Please fill in your comment which most closely reflects your evaluation of this book, so we may assist you better in future editions. Return to Education Computer Systems, MR1-1/M40, 200 Forest St., Marlboro, MA 01752.

1. I find the IDEAS Book to be:
   a) Very useful  
   b) Somewhat useful  
   c) Other ____________________________

2. My primary area of applications interest is:
   a) Administrative  
   b) Academic/Instructonal  
   c) Research/Scientific  
   d) Other ____________________________

3. I would like to see the following packages which were not in the fourth edition included in the next edition:
   a) ____________________________  
   b) ____________________________

4. I would like more information on the following Digital products:
   a) VAX-11/780  
   b) PDP-11 Family  
   c) Other ____________________________

5. The following information should be corrected for the next edition of IDEAS:
   a) Package Name: ____________________________ Page(s) ______
   b) Incorrect Data: __________________________________________

   __________________________________________

   c) Correct Data: ____________________________

   __________________________________________

Name ____________________________ Dept. & Mail Stop ____________________________
Title ____________________________ Address ____________________________
Institution ____________________________ City ____________________________ State Zip

359
IDEAS PACKAGE SUBMISSION FORM

Package Name: ________________________________

Package Description: Please attach a brief write-up describing your package.

Application Area (check one):

**ADMINISTRATIVE**
- Data Management
- Financial/Facilities Guidance
- Information Systems Library

**INSTRUCTION**
- CAI/CMI/CAT
- Computer Science/Languages
- Engineering Mathematics
- Physical Science
- Social Science
- Statistics

**UTILITIES**
- Graphics
- Networks/Communications
- System Utilities

Minimum Education Level: ________________________________

System Requirements:
- CPU(s) ________________________________

Operating Language ________________________________

Source Language ________________________________

Special Hardware/Software Requirements (if any) ________________________________

Developed By: ________________________________

__________________________

__________________________

__________________________

__________________________
Available From:
Name ____________________________________________

Company ____________________________________________

Address ____________________________________________

_____________________________________________________

Phone ____________________________________________

Price:
One Time Cost _______________________________________

Annual License Fee ___________________________________

Maintenance Cost _____________________________________

Documentation Cost ___________________________________

Is a license required? ________________________________

Distribution Medium: _________________________________

_________________________________________________________________

NOTE
If you have additional comments, please attach a separate sheet.

Authorization __________________________________________ (your signature)
(date)

Return to: IDEAS EDITOR
DIGITAL EQUIPMENT CORPORATION
EDUCATION COMPUTER SYSTEMS GROUP
MR1-1/M40
200 Forest Street
Marlboro, MA 01752

ANY QUESTIONS? CALL COLLECT: (617) 366-3663

363
IDEAS PACKAGE SUBMISSION FORM

Package Name: ____________________________________________________________

Package Description: Please attach a brief write-up describing your package.

Application Area (check one):

<table>
<thead>
<tr>
<th>ADMINISTRATIVE</th>
<th>INSTRUCTION</th>
<th>UTILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Management</td>
<td>CAI/CMI/CAT</td>
<td>Graphics</td>
</tr>
<tr>
<td>Financial/Facilities</td>
<td>Computer Science/Languages</td>
<td>Networks/Communications</td>
</tr>
<tr>
<td>Guidance</td>
<td>Engineering</td>
<td>System Utilities</td>
</tr>
<tr>
<td>Information Systems</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td>Physical Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Minimum Education Level: ___________________________________________________

System Requirements:

CPU(s) ________________________________

Operating Language ________________________________

Source Language ________________________________

Special Hardware/Software Requirements (If any) ________________________________

Developed By: __________________________________________

________________________________________

________________________________________
Available From:
Name _________________________________________________________

Company _______________________________________________________

Address ________________________________________________________

__________________________________________________________________

Phone ___________________________________________________________

Price:
One Time Cost __________________________________________________

Annual License Fee _____________________________________________

Maintenance Cost ________________________________________________

Documentation Cost ______________________________________________

Is a license required? _____________________________________________

Distribution Medium: _____________________________________________

__________________________________________________________________

NOTE
If you have additional comments, please attach a separate sheet.

Authorization _____________________________________________ (your signature)
(date)

Return to: IDEAS EDITOR
DIGITAL EQUIPMENT CORPORATION
EDUCATION COMPUTER SYSTEMS
GROUP
MR1-1/M40
200 Forest Street
Marlboro, MA 01752

ANY QUESTIONS? CALL COLLECT: (617) 366-3663
Digital Equipment Corporation
Education Computer Systems Group
Media Response Manager
PK3-2/M94
129 Parker Street
Maynard, Massachusetts 01754