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**An Annotated Directory of Citation
Database, Educational, System Diagnostics
and Other Miscellaneous Microcomputer
Software of Potential Use to Agricultural
Scientists in Developing Countries**

by

Thomas C. Stilwell and P. Jordan Smith

Working Paper No. 18 1984

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AN ANNOTATED DIRECTORY OF CITATION DATABASE, EDUCATIONAL,
SYSTEM DIAGNOSTICS AND OTHER MISCELLANEOUS MICROCOMPUTER
SOFTWARE OF POTENTIAL USE TO AGRICULTURAL SCIENTISTS IN
DEVELOPING COUNTRIES

By

Thomas C. Stilwell and P. Jordan Smith

Department of Agricultural Economics
Michigan State University

1984

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Table of Contents

<u>Section</u>	<u>Page</u>
I. Citation Database Software	1
II. Educational Software	13
III. Systems Diagnostics Software	16
IV. Miscellaneous Software	28
V. Copyright Information	33

PREFACE

There is a world wide revolution in small computer technology underway and scientists are struggling to find ways to utilize this new technology to help solve development problems in the Third World. We are pleased to announce a number of papers on microcomputers in international agriculture will be published in our International Development Papers series. The aim of these papers is to provide timely information about the rapidly changing state of the new micro-processing technology and its use in research. The papers are also intended as guides to agricultural and social scientists on choosing, installing, and maintaining microcomputer hardware and software systems in developing countries.

Some of the papers will also document field experiences of selected established projects using new data processing hardware and software. Other papers will concentrate on developing guidelines for establishing and maintaining successful microcomputer and/or programmable calculator installations for agricultural research in developing countries.

The present paper is the twelfth of these new papers. It is based on staff work by faculty members and graduate students of the Department of Agricultural Economics, Michigan State University, on a cost-effective data collection, management, and analysis techniques for developing country applications. This activity is carried out under the terms of reference of the Food Security in Africa Cooperative Agreement--DAN-1190-A-00-4092-00--between the Office of Rural and Institutional Development, Bureau of Science and Technology of the United States Agency for International Development and the Department of Agricultural Economics at Michigan State University.

One of the authors of the paper, Dr. Thomas Stilwell, has developed considerable experience in using microcomputers in agronomic research through his work with CIMMYT (International Maize and Wheat Improvement Center) and the Consortium for International Development in Bolivia. Dr. Stilwell is currently a Visiting Associate Professor at Michigan State University. He will be authoring other papers on microcomputers which will be published in our IDP series. Jordan Smith is an undergraduate in computer science at Michigan State University and is working as a research assistant on this Cooperative Agreement.

Readers are encouraged to submit comments about these new papers on microcomputers and to inform us of their activities in this area. Write directly to Dr. Michael T. Weber, Acting Director, Food Security in Africa Cooperative Agreement, Department of Agricultural Economics, Michigan State University, East Lansing, MI 48824-1039.

Carl K. Eicher, Carl Liedholm, and Michael T. Weber
Co-Editors
MSU International Development Papers

Citation Database Software

Citation databases are a special application of database management programs. Although the program may be written especially for this application, they are usually database programs formatted for the management of citation, references or abstracts from books, magazines or technical journals. A few even include functions which are useful for small library management. The better programs permit search and listing of citations by all categories or fields. Nearly all of the programs are preformatted. That is, the program comes with the type of information that can be stored and recalled already defined. This makes the setup and use a lot easier but in many research applications it also makes the database difficult or impossible to use. The best programs allow the user to set up the titles and arrangement of the information to be stored and recovered.

There are a few programs worthy of mention. Notebook and Sci-Mate appear to be well thought out packages. They have the advantage of not being formatted in some standard way but permit the researcher to form his own specialized format for the database to be built. Bibliotek and Citation have some worthy characteristics also but are definitely not in the same class as the first two mentioned. Both use predefined formats. Librarian list and Library Processes Sytem are well designed packages for the management of small libraries such as are found in experiment stations or agricultural colleges. An interesting special application is Museum Collector Catalog. It provides database handling of information for collections and museums such as insect collections, seed banks, etc.

The tables which follow summarize many of the key characteristics of the citation databases covered. Unfortunately, it has not been possible to review each of these packages. The information shown has been gathered from advertising brochures and software directories. If a feature or character was specifically mentioned as being part of the package, a "Yes" is shown. In most cases, it could not be determined if a package did not have a feature and that space has been marked with a "?". Normally we have assumed that if a feature is not advertised, the program does not have it.

This listing is intended to serve as a starting point for persons in need of a citation database manager. For more detailed information, write directly to the vendor. All efforts have been made to include all known packages but a few have certainly been missed. If you know of a package not included, give us its name for inclusion in the next update.

Some or all of the following abbreviations have been used in this listing.

A\$	Australian Dollar
Bfr	Belgian Franc
BrSt	British Sterling (Pounds)
Cards	Peripheral cards
Cass	Cassette or cassette recorder/player
Cn\$	Canadian dollars
CPU	Central Processing Unit
CRT	Cathode Ray Tube (video display system)
Cr\$	Cruzeiro (Brazil)
DM	Deutsch Mark (W. German Mark)
Disk	Disk drives or floppy disk
FF	French francs
HK\$	Hong Kong dollar
Joystick	Game control paddle
List	Program listing
MN\$	Moneda Nacional (Mexico)
Monitor	Video display system
NeFr	Franc (Netherlands)
NZ\$	New Zealand Dollar
P\$	Philippine pesos
RAM	Random Access Memory
ROM	Read Only Memory
Tape	Cassette or cassette recorder/player
US\$	United States dollars
Video	Video display system

Bibliography US\$ 125.00

Computer	Hardware	Op. System	Vendor:
CP/M	48K RAM	CP/M	Digital Marketing Corp.
IBM PC			2670 Cherry Lane
			Walnut Creek, CA 94596

USA

Bibliography is a citation data base manager that features an interface with word processor files. The data entered includes a keyword or phrase, author, title and publisher or source. The citations can be sorted, new entries added and all keywords listed. A unique feature permits Bibliography to search word processor files for references to keywords. It will then form a bibliography of the selected references or insert the citation in the text replacing the keyword. In a 64K system up to 1000 bibliography references can be handled. The major limitation seems to be the small amount of information permitted for each citation. The ability to automatically compile a bibliography for a technical paper is a very useful function. .PF DIS

Bibliotek US\$ 300.00

Computer	Hardware	Op. System	Vendor:
Apple II	48K	Applesoft Basic	Scientific Software Products
	2 disk drives		3171 Donald Ave.
			Indinapolis, IN 46224

USA

Bibliotek was written for management of a scientific literature reference data base. Information which may be stored for each reference includes up to 10 author's names (15 characters each), title of the article (up to 128 characters), name of journal or book (up to 58 characters), volume number, page numbers, dates, up to 6 keywords, location or publisher's name, plus the language of the article. As many as 600 references may be stored on a diskette and multiple diskettes are permitted. Data input is menu driven with predefined labels for all items. Individual references can be corrected or deleted. The database can be searched for a specific keyword, author, title, (or part of title), dates or a combination of these items. The references selected can then be sorted or edited and the final list printed as a Literature Cited list. The format (arrangement of items) of this list is completely variable and under user control. Selection can be done on up to 5 screening keys at one time. As many as 10 authors can be specified, up to 6 keywords specified and all selections may be done for single or multiple keys. This particular reference data base overcomes many problems of other databases such as limited number of authors and limitation to a single diskette. It is one of the better literature reference data bases reviewed.

Book Library US\$ 19.95

Computer	Hardware	Op. System	Vendor:
Apple			Computing Concepts
			P.O. Box 250
			Fredonia, NY 14063

USA

This program will index up to 1000 entries by author, title, and subject. It permits storage and search for more than one subject for each title.

Bookends US\$ 125

Computer	Hardware	Op. System	Vendor:
Apple II	40 col CRT 48K RAM	DOS 3.3	Sensible Software 6619 Perham Drive W. Bloomfield, MI 48033

USA

Bookends is a citation management package which can store 500-900 entries on a diskette. Multiple disks can be used for larger databases. Information which can be entered includes Title, Authors, keywords and notes. The notes can be of variable length. Citations can be sorted and the format of printed citations can be arranged to fit most publishing criteria..PF DIS

Citation US\$ 250.00

Computer	Hardware	Op. System	Vendor:
CP/M	58K RAM	CP/M 1.4+	Eagle Enterprises 2375 Busch Street San Francisco, CA 94115

USA

This is a Btree data base configured to manage references to articles in magazines, journals, books, etc. The basic information stored for each reference consists of the name of the journal or magazine (25 characters), date (mm/dd/yy format), page number (up to 4 digits), up to five keywords (20 characters each), a summary line (up to 70 characters) and comments (up to nine lines of 70 characters each). Each reference is indexed by keyword and journal/magazine. About 800 references can be stored on a single 500K disk with the index files or up to 1000 references on a 500K disk without the index file. Three formats are provided: title-author-date, name-address-phone number, and keyword-publication-date. The same basic functions are performed but different words are used for the categories. It is possible to mix entries in one data file using all three formats. This keeps all information in one file and simplifies the data entry since the user can switch from one format to another without rebooting the system. All input and output is menu-driven and a status line shows current operation parameters. Output functions include keyword (name or author) search. As many as ten keywords can be specified in a single search. During a search the selected records can be viewed and printed to a printer or disk file. The entire reference file can also be printed in sorted order. Utility functions permit file editing and recreation of index files. Obvious limitations are the lack of selection by other than keywords. There is also no provision for multiple authors or multiple data disks and it is not possible to use it on single sided single density disk systems.

Class Library Microcomputer System US\$ 1800.

Computer	Hardware	Op. System	Vendor:
TRS-80 II	3-4 disk drives 8 inch disks	BASIC	Capitol Systems Group 11301 Rockville Pike Kensington, MD 20795

USA

No other information is available at this time.

FYI 2000 US\$ 295.00

Computer	Hardware	Op. System	Vendor:
IBM PC	2 disk drives 64K RAM Word processor	MP/M	FYI Inc. P.O. Box 10998 Austin, Texas 78766
			USA

No other information is available at this time.

Idea Processor US\$ 295

Computer	Hardware	Op. System	Vendor:
IBM PC	2 disk drives 192K RAM	MS-DOS	Idea Ware 225 Lafayette St. New York, NY 10012
			USA

The Idea Processor combines word processor abilities with a text database management system. It is possible to move from one mode to the other without special procedures. The word processor features full screen editing, split screen inserts, boldface and underlined text on screen, block moves, file insertion, keyboard macros, unlimited document length and help screens. The associated print formatters features footnotes, indexing, time - date printing plus the usual formatting commands found in most word processors. The text database management system is actually a keyword indexed cardfile system. Each card can have up to 8000 characters and is indexed by a maximum of 10 keywords. Graphics can also be stored on a "card". Keyword searches can be done using logical operators and card entries can be merged into text files for printing. Vendors literature does not mention sorting capabilities..PF DIS

INFO DM 2800

Computer	Hardware	Op. System	Vendor:
Commodore	1 disk drive 32K RAM	Commodore	Informa GmbH Weender Landstrasse 3 3400 Gottingen
			W. Germany

INFO permits the storage of a text file and its classification by as many as 12 key words. Up to 2000 keywords and 2000 text files can be stored on 1 disk. Search and recovery can be done by keywords using various logical operations..PF DIS

LIB DAT DM 240

Computer	Hardware	Op. System	Vendor:
Apple II	1 disk drive 48K RAM	BASIC	Microcomputing Boschstrasse 1 3004 Isernhagen 1
			W. Germany

LIBDAT is a card index system for literature citations. Both comments and text

blocks can be searched for keywords. Up to 800 keywords can be stored at one time. Results can be sent to the CRT or printer. .PF DIS

Librarian US\$ 29.95

Computer	Hardware	Op. System	Vendor:
Apple	48K RAM 1 disk drive		Professional Computer Systems 318A Lincoln Court Bloomigdale, IL 60108

USA

This is an unformatted data base for use in storing information on articles, books or journals. Each book can have up to 8 key items of information in addition to the author and book or article name. The data base can be searched for any single key item or any combination of key items. It is possible to specify two key classifications as acceptable during search of a classification. A maximum of 600 books or articles may be stored on 1 diskette. Use of multiple diskettes is possible.

Librarian List US\$ 150.00

Computer	Hardware	Op. System	Vendor:
Apple	1 disk drive 48k RAM		ANDENT 1000 North Ave. Waukegan, IL 60085

USA

This is a series of customized data bases for library management. Each data base permits data entry, deletion, correction, sorting, searching, and printing in various formats. The specialized data bases are: BOOK/LOANS CATALOG maintains records on all loans with information on the author, title, publisher, subject, number, date, and borrower. Reports will list by due date or catalog number. JOURNAL CATALOG keeps information similar to that in BOOK/LOANS CATALOG with additional information on costs, subscriptions and wear index of each volume. WANT LISTS will keep record of requests for books. STAFF is a personnel data base for information such as addresses, telephone, and job information. STAFF SCHEDULES is a record of staff work schedules. TEXT EDITOR is a text editor for writing letters and reports. MAIL LIST is a name address data base for printing mailing labels. FILE TRANSFER is a communications package that permits sending or receiving files by modem. DATA BASE is an unformatted data base that the user can set up for a specialized application.

Library US\$

Computer	Hardware	Op. System	Vendor:
Sinclair	1 cassette 1K RAM	Sinclair	UAS P.O. Box 612 Haddonfield, NJ 08033

USA

This permits classification of books and articles by subject, location, author, title, and key word. Searches can be made on any of the classifications.

Library Index Br St

Computer	Hardware	Op. System	Vendor:
PET	48K RAM	Pascal	Databank 66 Queen Road Soughborough Leicestershire LE11 1HD G. Britain

Library Index will store up to 2000 entries with the book name and its' Dewey decimal number. It is possible to search for a particular title or number and to list the entire index sorted by title or number.

Library Processes System US\$ 225.00

Computer	Hardware	Op. System	Vendor:
TRS-80 I	2 disk drives	Level II Basic	Educomp
TRS-80 III	48K RAM		919 W. Canadian Street Vinita, OK 74301 USA

The Library Processes System is designed for a TRS-80 Model III computer with 48K RAM, 2 disk drives and a heavy duty tractor-feed printer. It is specifically written to manage most of the cataloging work of a small library. It allows input of information about each book, magazine, journal, etc. and will perform the following functions on the stored data: print a set of catalog cards or an individual card (with shelf list, author, title, 1-5 subjects and series); print book lists such as inventory, subject list, new books, etc.; addition of new entries; deletion of entries; entry sort by author, call numbers; entry of Dewey or LC catalog number (up to a 10 character Cutter Number); classify entries as Reference, paperback, professional or easy; search by key word or call letters; print listings in catalog format or catalog card format. Up to 660 entries can be stored on one Model III diskette.

Literadat DM 450

Computer	Hardware	Op. System	Vendor:
Commodore	1 disk drive		IMT Dr. Ing. H.P. Slabik Oberes Daufeld 9 5568 Daun/Vrilkaneifel W. Germany

Literadat permits searching a citation databasse using logical opertors. Up to 3400 entries can be stored on 1 diskette. No other information is availabaaalae at this time..PF DIS

Literatur DM 150

Computer	Hardware	Op. System	Vendor:
Commodore	1 disk drive IEEE port EDIT+		Rudolph EDV Auftrage Munterweg 6 2000 Hamburg 74 W. Germany

The storage capacity of Literatur is limited to the capacity of the diskette.

Results can be produced on a monitor or printer. Printed results can be formatted as desired. Data entry is done using EDIT+. Searching and selection can be done on all fields and can use logical operators. .PF DIS

Litver 1.3 DM 750

Computer	Hardware	Op. System	Vendor:
Commodore	1 disk drive 32K RAM		SM Softwareverbund Micro.GmbH Scherbaumstrasse 29 2000 Munchen 83 W. Germany

Mag Files for the Disk II

Computer	Hardware	Op. System	Vendor:
Apple	16K RAM		Southeastern Software 6414 Derbyshire New Orleans, LA 70126 USA

This magazine reference package will create and search files of magazine references. A total of 6 programs make up the package. Items are entered with a name and code number plus a comment line. Searching is done by the first four characters of each field.

Magazine Files US\$ 18.00

Computer	Hardware	Op. System	Vendor:
Apple	1 disk drive 16K RAM		Southeastern Software 6414 Derbyshire Drive New Orleans, LA 70126 USA

This is a disk based program for cataloging magazine articles by several fields.

Magazine/Book Reference US\$ 89.00

Computer	Hardware	Op. System	Vendor:
IBM PC	1 disk drive 64K RAM	PC DOS	Softrend P.O. Box 1462 Charlottesville, VA 22902 USA

This is an abstract data base program which permits the user to enter and recover references to articles in books, magazines, journals, etc. It uses Btree file handling. The basic information permitted for each entry is publication name, author, topic, subtopic, date, issue number, page number, and up to 80 characters for keywords or comments. Each entry is automatically indexed by title, author, topic, and subject. Up to 600 entries can be stored on a 160K disk drive. Output functions included are search by keyword, title, author, topic or subtopic, list of all references for a desired author, list all references with any desired topic or subtopic. It will also list all authors, publications, topics, or subtopics currently stored. Output may be on video or an 80 column printer. Operation is by menu and screen prompts. The vendors

literature does not give information about the manual. Although not specifically excluded it appears as though it may be difficult to include both a journal name and the title of a paper in the journal within the limits of the predefined formats. It may also be impossible to use more than 1 data disk for each index disk.

Microlibrarian US\$ 89.95

Computer	Hardware	Op. System	Vendor:
CP/M	2 disk drives	CP/M	Microventures
	64K RAM	MP/M	P.O. Box 2802
	90K/diskette		La Jolla, CA 92038-2802

USA

Microlibrarian will store up to 250 citations on a 90K diskette, 500 citations on 180K and more on larger capacity diskettes. The types of information which can be entered for each citation are author name, title, source (journal name), pages, date, abstract (up to 250 characters) and up to 7 keywords. Keywords form a separate reference file and up to 2000 distinct keywords can be used. Multiple diskettes can be used. Citations can be sorted by author, source or a combination of these two. A keyword list can also be printed. Existing citations can be edited or deleted. All results can be produced on the monitor or printer. Since multiple authors are not specifically mentioned it is assumed that only one author name is permitted, a problem with most journal articles.

Museum Collector Catalog US\$ 150.00

Computer	Hardware	Op. System	Vendor:
Apple	48K RAM		ANDENT
	1 disk drive		1000 North Ave.
			Waukegan, IL 60085

USA

This is an interesting application program useful for small museums and most collections of insects, seeds, books, and other scientific items. It is a set of ten programs which handle specific functions: COLLECTIONS is the main cataloging program that will store data on accession number, classification category, description of the item, value, if on loan, and if it has been discarded or loaned. It will also print summary reports, labels, and catalog cards. RESERACH is another smaller data base for keeping track of museum staff, what projects they are currently involved in and their publication record. SCHEDULE is a data base for keeping track of meetings, appointments, and daily schedules. LITERATURE FILE is a data base for articles, books and references. It gives reports on searches for specified authors, subjects, etc. SUBSCRIPTIONS is a data base for keeping track of magazine and technical journal subscriptions. LIBRARY is a data base for books and printed material loaned or to be purchased. STAFF\PHONE is a telephone and address data base. TEXT EDITOR is a text editor for reports or letters. MAIL LIST is a name and address data base for printing mailing labels. FILE TRANSFER is a communications package that permits sending or receiving files by modem. DATA BASE is an unformatted data base that the user can set up for a specialized application. The disk is not protected and is written in BASIC to permit easy modification.

Notebook ?

Computer	Hardware	Op. System	Vendor:
IBM PC	64K RAM	MS-DOS	Digital Marketing
		PC-DOS	2363 Boulevard Circle
		CP/M-86	Walnut Creek, CA 94595

USA

Notebook is a database management system for text type data such as bibliographic citations or abstracats. Data entry is by keyboard or from other ASCII files. Each record can have up to 20 fields. Each field can have 500 - 4000 characters depending on the computer used. Total file length depends on disk capacity. Labels and data format are user defined and can be changed at any time. Sorting and searching can be done on any field. Reports or listings an be formatted to the users choice. .PF DIS

Personal Library Cataloger US\$ 19.95

Computer	Hardware	Op. System	Vendor:
Apple	48K RAM	Integer Basic	LAST
			619 Sarver Ave.
			Mongotmery, AL 36109

USA

This data base system is designed to catalog items by title, author, classification (subject), date, and location. Functions include add, delete, revise data, plus listings and searches on any item. It can print a general inventory plus book labels. There is no limit on the number of entries.

Quick-Search Librarian US\$ 75.00

Computer	Hardware	Op. System	Vendor:
Apple			Interactive Microware, Inc
			P.O. Box 771
			State College, PA 16801

USA

This is a menu driven bibliography data base for references and citations. A single disk can hold up to 1,000 citations with 3 keywords, title, volume, year, page, and 100 characters of description for each citation. Presumably when more information is included fewer citations can be stored on a disk. A total of 255 different keywords can be used to describe or classify entries but only 12 of that total can be used for one entry. A total of 4 lines (144 characters total) can be used to enter author, title, and comments. Entries can be edited to make changes or corrections. Searching can be done using up to 16 parameters with all logical operators and parenthesis used to set up the conditions. A typical search speed is 50 citations per second. Citations can be sorted on any or all of the author/year/journal fields in any order. Typical sorting speed is 40 citations per second. Results can be printed in a user defined format.

Sapana-Soft-Index-I US\$ 49.95

Computer	Hardware	Op. System	Vendor:
IBM PC	64K RAM	PC DOS	Sapana Micro Software 1305 South Rouse Pittsburg, Kansas 66762 USA

The Sapana-Soft-Index-I is a menu-driven citation database management system for the IBM PC. Up to 1070 entries can be stored on a single sided diskette or 2230 entries on a double sided diskette. There is no provision for multiple diskettes. Each entry has the following fields: Title (70 char.), Journal code (numeric 1-255), year, month, date, issue (16 char.), page (16 char.), topic code (numeric 1-255), and subtopic code (numeric 1-255). The file can be sorted by title, author, Journal name, topic code, subtopic code or date. Citations can be listed in index order for the same items. It is not clear how multiple authors can be handled and there is no provision for storing abstracts.

Sci-Mate Personal Data Manager US\$ 540.00

Computer	Hardware	Op. System	Vendor:
IBM PC	2 disk drives	CP/M-80	ISI
TRS-80 II	80 column CRT	CP/M-86	3501 Market St.
CP/M	64K RAM		Univ. City Science Center
Apple II			Philadelphia, PA 19104 USA

Sci-mate Personal Data Manager is half of a system for management of scientific literature citations. The other part, Sci-Mate Universal Online Searcher, is intended for online search of databases. The Personal Data Manager is for management of a disk based citation database. The vendor recommends two 8 inch drives or a hard disk. Up to 20 fields can be used for information storage. Field labels can have up to 8 characters.

A single record of information can be up to 1900 characters long. As many as 50 different formats can be maintained on one disk. The label formatting, data entry, searching and printing are menu-driven. Articles can be flagged with user defined labels. Sorting can be done on any field. A report generator permits screen display or printer output of selected citations. Citations may be searched for key words or phrases in any field.

Softlist DM 452

Computer	Hardware	Op. System	Vendor:
Apple II	2 disk drives	Pascal	SoftConstruct Postfach 45 10 28 5 Koln 41 W. Germany

Softlist can handle up to 1500 keywords. No other information is available at this time..PF DIS

Sortlit 2.2 DM 452

Computer	Hardware	Op. System	Vendor:
Apple II	2 disk drives	UCSD P-Sys.	Soft Construct
	64K RAM	Pascal	Postfach 4510 28
	80 col CRT		n-5000 Koln 41

W. Germany

Sortlit 2.2 is a citation management system that can store up to 552 references on a single Apple diskette. Multiple diskettes, 8 inch disks and hard disks are also supported. The information which can be entered for each citation includes the title, Author, classification code, source, date, volume, pages and up to 1536 keywords. Each keyword can have 23 characters. Address can be stored for up to 254 different Journals. Searching of the database can be done by keywords, classification code, journal, volume or year. Keyword searches can use "and" and "not" logic. Selections can be produced on a monitor or printer. The 200 page German language manual includes a tutorial plus examples from the sample database..PF DIS

STAR

Computer	Hardware	Op. System	Vendor:
Alpha	128K RAM	AMOS	Cuadra Associates
	90M hard disk		Suite 305
			2001 Wilshire Blvd.
			Santa Monica, CA 90403
			USA

No other information is available at this time.

Superfile US\$ 295.00

Computer	Hardware	Op. System	Vendor:
CP/M	48K	CP/M	F Y I Inc.
	2 disk drives	MP/M	P.O. Box 10998
	Word Processor		Austin, Texas 78766

USA

Superfile is a menu-driven database manager for text data such as letter or bibliographic citations. Data is added or modified with a word processor which is not included in the package. A wide variety of word processors can be used. Two types of text information are entered: keywords and main body text. All searching is done on keywords. Sorting can be done on the first few characters of the text body. Searching and recovery of items can be done with various combinations of AND, OR, NOT plus keywords. Command files may also be used for standard search sequences. Items which have been selected can be output to a monitor, printer or disk file. The length of text which can be entered is unlimited but only 250 keywords can be entered per item. Up to 255 disks can be used in a single database. One limitation as a bibliographic database is that the format of entries cannot be changed. .PF DIS

Educational Software

A brief description of each entry is given plus a few vital bits of information such as vendor, price, operating system and type of computer. One word of caution should be given about the 'type of computer'. This information should be regarded as an indication, not the final word. Many software vendors are modifying their software packages to run on several different microcomputers. Because their availability is constantly changing, do not limit your reading only to those packages which run on your computer. An inquiry to the vendor may reveal that a version has just been released for your computer.

As with all other areas of microcomputer software, programs are constantly being introduced or modified. This listing is complete to the best of our knowledge but we recognize that there are probably omissions. If you know of a statistical package not included please send its name and the vendors' address. It will be included in the next update.

Diffusion Game US\$ 55.00

Computer	Hardware	Op. System	Vendor:
Apple II	1 disk drive	DOS 3.2.1	Conduit
TRS-80 I	48K RAM		PO Box 388
TRS-80 III			Iowa City, Iowa 52244

USA

Diffusion Game is an interesting simulation useful in the teaching of extension methods in developing countries. The simulation consists of "visits" by a student to two separate but similar villages. Each village has a leader with variable levels of influence. The student has a village map to assist in the simulation. The student must identify the most influential leaders in each village, gather information about some practices or behavior and convince 70% of each village to adopt an agricultural innovation. This must be done within the equivalent of one year and with a limited number of visits. The game ends when all work days are used or the required adoption is reached. Different diffusion strategies can be used and their effectiveness is based on actual responses in developing countries. A few random event problems are built in to add realism and each village is sufficiently different so that different strategies must be used. Most students can complete a game with both villages in 30 - 50 minutes. This would be very useful to try as a game with university students or new extension agents.

Lab Statistics Package US\$ 50.00

Computer	Hardware	Op. System	Vendor:
Apple II	1 disk drive		High Technology Software
			PO Box 14665
			2201 NE 63 St.
			Oklahoma City, OK 73113
			USA

Lab Statistics Package is primarily intended to assist in teaching regression. Data entry is from the keyboard or from a disk file. Up to 30 cases with two variables can be analyzed. Seven types of regression can be used: linear, log, hyperbolic, geometric, quadratic, exponential and quadratic log. Results include the coefficient, intercept, standard deviation and errors.

SAMP US\$ 65.00

Computer	Hardware	Op. System	Vendor:
Apple	48K RAM		CONDUIT
	1 disk drive		PO Box 338
			Iowa City IA 52244

USA

SAMP is an instructional aid for teaching survey sampling that can be used as part of a course or without classroom backup. It enables a student to see results of conducting an attitude survey in a small town using different sample sizes and one of four sample designs. The student's session with SAMP begins with an introduction to Littleton, a community of 11,000 that is considering plans to redevelop its Main Street. The city fathers are interested in citizens' attitudes toward these plans. The student's task is to discover whether the people are in favor of redevelopment and to decide which sampling design and

sample size would be the most appropriate for an inquiry of this kind. The program offers the student's a choice of four sampling designs: simple random sampling, cluster sampling, stratified sampling, and quota sampling. Once the student has selected the sampling design, the program asks for the number of respondents to interview. (In the cluster design, the student first specifies the number of clusters.) The program then "interviews" the respondents and reports back a summary of statistics and a histogram showing the distribution of responses, their standard deviation, and the standard error of the mean. The program also reports costs that the student will use to calculate the cost of any given survey. These costs are the number of "call-backs" (the number of times interviewers had to call again at addresses to find respondents at home) and the average number of miles the interviewers had to travel between interviews. The student must record these statistics for later use in preparing his report. The student then can either request another survey using the same sample design, perhaps with a different sample size, or can move on to the next design. Even if the student chooses to repeat the survey on the same sized sample using the same design, the results will probably differ because the program randomly selects respondent's from the town's population. The strong point of this package is its ability to show the relationship between precision, sample size, sample design, and sample cost. The price includes one copy of an Instruction Guide.

Zendar US\$ 29.95

Computer	Hardware	Op. System	Vendor:
Apple II			K-12 MicroMedia
			PO Box 17
			Valley Cottage, NY 10989
			USA

Zendar is a simulation game in which the player attempts to manage the economic and defense problems of a developing country.

System Diagnostics Software

Systems Diagnostic programs are software packages designed to tell you what is wrong with your computer. The more complete packages will also assist you in repairing or adjusting the ailing part. Certain types of disk diagnostics have been available for years but were intended for use by computer repair technicians. Only within the last 2-3 years have packages become available to assist non-technical persons diagnose their hardware problems. In many cases a diagnostics program can easily pinpoint a faulty disk drive or printer and sometimes even tell you what component is malfunctioning. With this knowledge a user in Cochabamba can simply order a replacement part instead of sending his entire computer back to Miami for diagnosis.

Many of the established computer manufacturers offer system diagnostics software but its' availability is frequently limited. The best package in the world does you no good if it is only sold to dealers and your nearest dealer is 3700 Km away. Therefore this listing has been limited to those system diagnostic packages sold by non-manufacturers (ie. third party vendors) in order to be assured of product availability.

Software Diagnostics packages can be classed into three groups based on the complexity of the tests performed:

1. simple RAM test
2. complete system tests
3. complete system tests and adjustments

Simple RAM Test

This type of diagnostic software is the most simple and also the cheapest. Normally its only function is to verify the ability of the computer RAM memory to accurately retain information. This is done by putting a known value into a specific memory location and then reading that value to see if it has changed. This is repeated 5-10 times for nearly all RAM locations. If there is an error, the error message will show the memory location which is unstable. It is then up to the user to discover which memory chip needs to be replaced.

Because this is a very simple program there are many public domain versions and sometimes magazines publish listings of memory test programs. Normally this type of program is not very useful for finding problems in your microcomputer hardware. Most problems occur in printers or disk drives and memory errors are rare.

Complete System Test

This type of diagnostic software will perform tests on nearly all of the hardware components of a microcomputer system. The types of equipment or functions normally tested are:

- RAM: This is the same as the simple RAM test described above. Better programs will relocate the testing program so that all of the RAM is tested.
- ROM: This normally includes tests on ROM functions, commands, languages, et cetera.
- CPU Registers: This tests operation of the internal CPU registers and CPU flags.
- Video Function: This is normally just a simple test to verify that the video display will produce the ASCII character set. More sophisticated diagnostics programs will also test the calibration of the monitor, the yoke alignment, graphics generation and will generate patterns to test for specific monitor problems.
- Keyboard Function: This is done by requiring the user to press the indicated keys in order to check for proper key contact and character generation.
- Printer Function: This is also just a test to see if the printer will produce the ASCII character set. Most printers have built in test modes which will test reproduction of all printer characters.
- Disk Drive Speed Test: This is a test to determine the speed of rotation (rpm) of the disk drive and usually gives some type of graphic display of average speed and variation in speed. Some programs will accumulate records over time when used regularly to show slow changes in diskspeed adjustments. Disk speed changes are a major source of read/write errors.
- Disk Formatting Test: This test will format a blank disk and check for any errors in the formatted sectors.
- Disk Read/Write Test: This specifically tests the ability of the drive to accurately write and read information on each track (a source of R/W errors).
- Sector Zero Read Test: This tests the ability of the disk drive to accurately find the index track on a diskette (a source of boot errors).
- Port Tests: Depending on the computer being tested, the program will test joystick ports, tape recorder ports or modem port functions.
- Plug in Card Tests: For computers with plug in peripheral cards the diagnostic software will test to see if basic connections are good but no function tests are performed.

These tests are normally contained in the better diagnostics packages. For specific computers there may be a few added frills or special tests depending on the equipment available for that computer. An example of such extras are the tests for the DC Hayes Micromodem II contained in Master Diagnostic. A few specialized diagnostic packages such as DDT only provide information about disk drives since this is a frequent source of trouble. These packages also provide instructions on how to adjust the drive speed. Most of the complete packages only provide a readout of the problem and offer no help in repairing the problem.

Complete System Tests and Adjustments

This type of diagnostic software offers most of the preceeding test functions plus the ability of interactively adjusting some of the equipment such as disk drives. Normally it requires an oscilloscope and a basic knowledge of electronics to diagnose the problem. They usually provide some guidance in the adjustment procedures needed. This type of software is useful if you do not have a dependable electronics repair service locally and must do all the repair work yourself. If you have a dependable electronics repair service locally one of these packages may be all that is needed to convert the repairman into a resonable computer repairman.

Abbreviations Used

US\$	US Dollars
Br St	British Sterling
RAM	Random Access Memory
ROM	Read Only Memory
Disk	Disk Drive System
Tape	Cassette tape system
Video	Video Display system
Cards	Peripheral Cards
CPU	Central Processing Unit
Joystick	Game Control Paddles

Summary of System Diagnostics Packages

Software Package	Computer	RAM	ROM/ CPU	card	video	key brd	printer
80 Tests	TRS-80 I TRS-80 III	Y	Y	N	N	N	N
Apple Doctor	Apple II Franklin	Y	Y	Y	Y	N	N
Apple Cillin	Apple	Y	Y	Y	Y	Y	Y
Diagnostic	Pet	Y	N	N	N	N	N
Diagnostic	Video Genie	Y	Y	N	Y	N	N
Diagnostics II	CP/M IBM PC N Star	Y	Y	N	Y	N	N
Disk Drive Timer	TRS-80 I TRS-80 II TRS-80 III Apple	N	N	N	N	N	N
FD-8 Diagnostics	Heurikon	N	N	N	N	N	N
Floppy Disk Diag.	Color Comp	N	N	N	N	N	N
IBM PC MD	IBM PC	Y	N	N	N	N	N
Integrity +	Apple	Y	N	N	N	N	N
Locksmith	Apple	N	N	N	N	N	N
Master Diagnostic	Apple	Y	Y	Y	Y	N	N
Memcheck	PET	Y	N	N	N	N	N
Memory Test Pack	PET	N	N	N	N	N	N
Memory Verify	Apple	Y	N	N	N	N	N
Memtest	Heurikon	Y	N	N	N	N	N
Mini Disk Drive A.	TRS-80	N	N	N	N	N	N
Super RAM	PET	Y	N	N	N	N	N
System Checker	CP/M	Y	Y	N	Y	N	Y
System Checker	TRS 80 I TRS 80 III	Y	Y	N	Y	Y	N
Tinydoc	CP/M	Y	Y	N	N	N	N
Utility Pack I	Apple	Y	Y	Y	Y	N	N

Software Package	Computer	Disk Speed	Disk Align	Disk R/W	Disk Othr	Ports	Other
80 Tests	TRS-80 I TRS-80 III	N	N	N	N	N	N
Apple Doctor	Apple II Franklin	?	?	Y	?	Y	Y
Apple Cillin II	Apple	Y	N	Y	Y	N	N
Diagnostic	Pet	N	N	N	N	N	N
Diagnostic	Video Genie	N	N	N	N	N	N
Diagnostics II	CP/M IBM PC N Star	N	Y	Y	Y	N	N
Disk Drive Timer	TRS 80 I TRS 80 II TRS 80 III Apple	Y	N	N	N	N	N
FD-8 Diagnostics	Heurikon	Y	Y	Y	Y	N	?
Floppy Disk Diag.	Color Comp	Y	Y	Y	Y	N	N
IBM PC MD	IBM PC	N	N	N	N	N	N
Integrity +	Apple	N	N	Y	Y	N	N
Locksmith	Apple	Y	N	N	N	N	N
Master Diagnostic	Apple	Y	N	Y	Y	Y	Y
Memcheck	PET	N	N	N	N	N	N
Memory Test Pack	PET	N	N	N	N	N	N
Memory Verify	Apple	N	N	N	N	N	N
Memtest	Heurikon	N	N	N	N	N	N
Mini Disk Drive A.	TRS-80	Y	Y	Y	Y	N	Y
Super RAM	PET	N	N	N	N	N	N
System Checker	CP/M	N	N	Y	N	N	N
System Diagnostic	TRS-80 I TRS 80-III	Y	Y	Y	Y	Y	?
Tinydoc	CP/M	?	?	Y	Y	Y	Y
Utility Pack I	Apple	N	N	Y	?	Y	Y

Apple Doctor US\$ 50.00

Computer	Hardware	Op. System	Vendor:
Apple II		Integer Basic	Creative Discount Software 256 S Robertson, Suite 2156 Beverly Hills, CA 90211

USA

It will test RAM, ROM, various boards, disk drives, tape systems, game controls, and video output.

.PF DIS

Apple-Cillin II US\$ 49.95

Computer	Hardware	Op. System	Vendor:
Apple Franklin	1 disk drive 16K RAM	assembly	XPS Inc. 323 York Road Carlisle, Pennsylvania 17013

USA

This general diagnostic program will perform the following tests: check bottom 8K of memory, check upper 40K of memory, check most 16 and 32K plug in RAM cards in any slot, check Applesoft and/or Integer BASIC ROMS, check the monitor ROM, check disk speed, formatting, read/write and head seek test, checks 6502 internal registers and flags, checks data path to and from peripheral cards, does a printer test pattern, keyboard test, pattern. No external instruments are needed. Results can be printed for reference.

80 Tests US\$

Computer	Hardware	Op. System	Vendor:
TRS-80 I TRS-80 III	16K RAM	machine lang.	Instant Software, Inc. Elm Street Peterborough, NH 03458

USA

This program will test level II ROM and RAM for proper function.

Diagnostic Br St

Computer	Hardware	Op. System	Vendor:
PET	8K RAM	BASIC+Binary	Micro Act 516 Vicarrage Road EPG Baston Birmingham B15-3ES England

This program tests all RAM locations with all characters and displays the locations of any faulty locations.

Diagnostic Br St

Computer	Hardware	Op. System	Vendor:
V. Genie	16K RAM		A.J. Harding 28 Collington Ave. Bexhill-on-Sea East Sussex G. Britain

This performs a test of ROM, RAM, and video memory with a report of what parts are faulty.

Diagnostics II US\$ 125.00

Computer	Hardware	Op. System	Vendor:
CP/M IBM PC Micropolis North Star	36K RAM	CP/M 2.2	SuperSoft Assoc. P.O. Box 1620 Champaign, Illinois 61820 USA

The areas tested are the following: (1) RAM: Includes quick test, walking bit test, Burn-in test and speed test. Errors are reported by bit and address. Additional features are automatic default to the CP/M Temporary Program area, a memory map display and memory bank sheet (useful to locate the faulty chip). (2) CPU Test: This part will automatically recognize the type of CPU being tested. The testing involves executing all single command sequences and some multiple command sequences. After each sequence all the CPU registers are verified for correct values. This test can be called from a SUBMIT file. (3) PRINTER: This section tests that all ASCII characters can be printed in each column position on the printer. For daisy wheel printers it also tests head and carriage motion such as reverse printing, overprinting, boldface printing, superscript, subscript and page scaling. (4) Terminal: This part tests the generation of all ASCII characters in all fields on the monitor, cursor, positioning, foreground function and erase functions. A patch routine is supplied to configure software for most terminals. (5) Disk: This section tests read/write, seek accuracy, and data integrity. The program allows tests of user defined patterns, test sectors, and memory location. An alignment program is designed to assist in aligning the read/write head. Quick Test: This is a quick 4 minute check of memory, CPU and disk drives.

Disk Doctor US\$ 19.95

Computer	Hardware	Op. System	Vendor:
Apple II	1 disk drive 32K RAM		Creative Computing Software 39 E. Hanover Ave. Morris Plains, NJ 07950 USA

Disk Drive Timer US\$ 29.95

Computer	Hardware	Op. System	Vendor:
TRS-80 I	1 disk drive		Computronics
TRS-80 II			50 N. Pasack Road
TRS-80 III			Spring Valley, NY 10977
Apple			USA

The principle function of this package is to test for proper disk drive speed and to permit the user to adjust the speed to the proper range. The software tests and graphically displays the disk drive speed. The manual gives instructions for adjusting and checking drive speed. Only two screwdrivers are needed to adjust the speed.

FD-8 Diagnostics US\$ 65.00

Computer	Hardware	Op. System	Vendor:
Heurikon		F-DOS	Midwest Scientific Inst. Inc.
			220 W. Cedar
			Olathe, Kansas 66061
			USA

This is a complete set of disk drive diagnostics for the repair technician. The tests and adjustment procedures included are sector zero adjustments, test of sector buffer RAM, sector read/write, and read/write head alignment. Alignment requires use of an oscilloscope plus other test equipment.

Floppy Disk Diagnostic US\$ 24.95

Computer	Hardware	Op. System	Vendor:
Color Comp	1 disk drive		RAMparts
			Box S-8, Gulf Road
			Greenfield, NH 03047
			USA

This set of software will test 35 or 40 track disk drives, controller functions, drive speed, data read/write, track seek function, read/write with different patterns, and switches and other mechanical components. It also tests cross-cylinder interference and compatibility between different drives. A total of 19 error messages are cross referenced to 14 possible drive problems.

.PF DIS

IBM PC Memory Diagnostics US\$ 25.00

Computer	Hardware	Op. System	Vendor:
IBM PC	1 disk drive		Micro Match
	48K RAM		10343 Commerce Avenue
			Tujunga, California 91042
			USA

This enables testing all of the memory in the IBM PC except that used for the diagnostic program. Diagnostics are included to help determine which chips are

faulty. Test results can be sent to a printer or to a disk file.

Integrity Plus US\$ 149.00

Computer	Hardware	Op. System	Vendor:
Apple	1 disk drive	Applesoft	Solidus International Corp # 204 4202 Guide Meridian Bellingham, WA 98226

USA

This diagnostic program will check RAM, disk drive head movement, and disk read/write capability. It will handle most printer cards and will run manually or automatically.

Locksmith Inc. US\$ 99.95

Computer	Hardware	Op. System	Vendor:
Apple	1 disk drive		Omega Microware 222 South Riverside Plaza Chicago, Ill 60606

USA

Locksmith is one of the best known bit copiers. It enables the user to make backup copies of copy-protected Apple diskettes. It should be noted that making copies of software for sale or use by others is illegal. Locksmith does not change the program serial number or other identifying codes so that the copies can always be traced back to the purchaser. The main menu gives the choice of functions. The copy function permits alteration of the program parameters so that copy of most known protection systems is possible. A sheet giving non-standard parameters for many protection schemes is provided. In addition to the copy function there is a diskette surface check routine to verify the integrity of the diskette, a disk drive speed calibration check, a degauss and erase function to erase a diskette, a nibble editor that permits the user to change specific bits on a disk file, and Quikscan which displays track contents.

Master Diagnostic US\$ 55.00

Computer	Hardware	Op. System	Vendor:
Apple	1 disk drive	Apple DOS	Nikrom Technical Props. 25 Prospect Street Leomisnter, Mass. 01453

USA

Previously known as Brain Surgeon, this package tests the following equipment/functions for the Apple II: RAM test, motherboard ROM, applesoft ROM card, integer ROM card, parallel ROM card, disk speed calibration, disk read/write, disk write protect, disk head cleaning check, disk drive maintenance, DC Hayes micromodem II, monitor skew, monitor modulation calibration, monitor text display, monitor test pattern, monitor yoke alignment, lo-res color, hi-res color, random hi-res generator, lissajous patterns, speaker, square wave modulation, paddle and speaker, paddle and button, and paddle drift. The Diagnostic Plus is US \$75.00 and adds a diskette head cleaner kit, CRT cleaner, and some cleaning pads.

MEMCHECK Br St

Computer	Hardware	Op. System	Vendor:
PET	4K RAM		Qwerty Computer Systems 20 Worchester Road Newton Hall Durham G. Britain

Checks RAM for faulty bits.

Memory Test Package

Computer	Hardware	Op. System	Vendor:
PET			Supersoft 28 Burwood Ave. Pinner Middlesex G. Britain

Checks all RAM for faulty bits.

Memory Verify US\$ 10.00

Computer	Hardware	Op. System	Vendor:
Apple	32K RAM		Rainbow Computing Inc. 9719 Reseda Boulevard Northridge, Calif. 91324 USA

A diagnostic routine that checks a given range of memory, indicating any addresses found to be faulty, as well as the data that was placed in the memory cell, and the faulty data read back.

Mentest Br St 50.00

Computer	Hardware	Op. System	Vendor:
Heurikon	4K RAM		Software Dynamics 2111 W. Crescent Anaheim, California 92801 USA

This program will test RAM of 6800 and 6809 CPU's for stuck-at errors, pattern sensitivity, multiplexer error and other memory subsystem problems. Updates of this package are available at 50% of their market price to owners of previous versions.

Mini Disk Drive Alignment US\$ 109.00

Computer	Hardware	Op. System	Vendor:
TRS-80 I	16K RAM oscilloscope		Racet Computers Suite M 1330 N. Glassell Orange, California 92667 USA

This is a full disk drive alignment program designed for use by electronics technicians with no computer experience. Equipment needed includes a dual trace oscilloscope and hand tools. An alignment diskette permits a technician to do the following adjustments: radial disk head alignment, index sensor adjustments, and motor speed adjustment. It is designed to run on the TR S-80 model I with expansion interface. This converts the model I to a disk drive testing unit for testing other disk drives.

Super-Ram US\$ 20.00

Computer	Hardware	Op. System	Vendor:
PET	8-32K RAM		Computer House Div
			1407 Clinton Rd.
			Jackson, MI 49202
			USA

Super-RAM will check all available RAM for errors.

System Checker

Computer	Hardware	Op. System	Vendor:
CP/M	2 disk drives	CP/M	SuperSoft Assoc.
			PO Box 1628
			Champaign, Illinois 61320
			USA

This is a less comprehensive diagnostic program than Diagnostics II by the same company. It is designed to run with very little user attention., It will check RAM, CPU, terminal, disk drive and printer function. Each item is given a pass-fail grade. This is a useful program if you have a repairman handy and only need to know which piece of equipment needs to be repaired. System checker is designed for use by personnel with no knowledge of computer equipment. If you need more specific information or actual assistance with minor adjustments, Diagnostics II is recommended.

System Diagnostic US\$ 99.95

Computer	Hardware	Op. System	Vendor:
TRS-80 I	16-48K RAM		Howe Software
TRS-80 III			14 Lexington Road
			New City, New York 10956
			USA

This diagnostic package will do a checksum test of ROM, perform separate tests on all RAM, video RAM check, video signal check, character generator check, keyboard contact checks, character test on a line printer, cassette read-write and verify, RS-232-C interface checks and seven separate disk drive checks. The system can run with operator monitoring or it can run unattended while recording results on a printer. It will check single and double density 35, 40 and 80 track drives.

Tinydoc US\$ 29.95

Computer	Hardware	Op. System	Vendor:
CP/M		CP/M	R.F. & Associates
			1930 Purdue Avenue
			Los Angeles, California 90025
			USA

This software tests I/O, memory, disk system, CPU, pinpoints bad IC's, and will recover disk files.

.PF DIS

Utility Package I US\$ 50.00

Computer	Hardware	Op. System	Vendor:
Apple			Compusoco
			26251 Via Roble
			PO Box 2325
			Mission Viejo, Calif. 92690
			USA

Utility Package I will perform a series of tests which include testing all Apple supplied peripheral boards, all RAM and ROM chips, disk drive electronics, tape system, game controls and video output. Test results include comments on service needs. Instructions are given on the screen.

.PF DIS

Miscellaneous Software

A brief description of each entry is given plus a few vital bits of information such as vendor, price, operating system and type of computer. One word of caution should be given about the 'type of computer'. This information should be regarded as an indication, not the final word. Many software vendors are modifying their software packages to run on several different microcomputers. Because their availability is constantly changing, do not limit your reading only to those packages which run on your computer. An inquiry to the vendor may reveal that a version has just been released for your computer.

As with all other areas of microcomputer software, programs are constantly being introduced or modified. This listing is complete to the best of our knowledge but we recognize that there are probably omissions. If you know of a statistical package not included please send its' name and the vendors' address. It will be included in the next update.

Budget Model 1000.0

Computer	Hardware	Op. System	Vendor:
Apple III	2 disk drives 132 col Printer	Applesoft Basic	Data Systems Inc. 1810 Chester Ave. Bakersfield, CA 93386
			USA

Cropping Gross Margins NZ\$ 250.00

Computer	Hardware	Op. System	Vendor:
TRS-80 I	80 col CRT	CP/M	Kellogg Farm Management Unit
TRS-80 II	25K RAM	TRS DOS	Lincoln College
TRS-80 III			Canterbury
			New Zealand

Cropping Gross Margins is a menu driven package designed for farmer use but which has application in farming systems research also. The basic information required includes all variable production costs, estimated yields, estimated sale prices, and total area to be planted of a crop. There are several built in estimation routines where accurate information may not be available. For example, if tractor fuel consumption/hr is not known, a subroutine will ask for information such as fuel type and horsepower and calculate an estimated fuel cost/hr. Data for several crops can be handled at once to compare economic effects of rotations. Results include individual/combined crop budgets, and individual/combined crop costs and revenues. A built in sensitivity test shows effects of a 10% variation in estimated yields and sale prices.

Harvard Project Manager US\$ 395

Computer	Hardware	Op. System	Vendor:
IBM PC	2 disk drives 192K RAM	MS-DOS	Harvard Software 521 Great Road Littleton, MA 01460
			USA

The Harvard Project Manager is a Critical Path Method project manager. Up to 200 jobs or milestones can be assigned per project. All reports can be printed on printer or DIF files..PF DIS

Language Translator II US\$ 39.95

Computer	Hardware	Op. System	Vendor:
Apple	80 col Printer		ONASCO 3392 W. Aksarben, Ave. Littleton, CO 80123
			USA

Language Translator appears to be a word-for-word translator program. There are no checks for proper grammar or sentence structure but it could be useful for a crude translation when a professional translator is not available. Vocabulary

may be added or deleted or new language added. Spanish is provided with the order.

MADS II (Multipurpose Agr. System) free

Computer	Hardware	Op. System	Vendor:
HP-9845	2 Disk drives		FAO Investment Center
	192K RAM		Via delle Terme di Caracalla
	80 col CRT		00100 Rome

ITALY

Data describing a project are organized into "commodities" (i.e. items having a price), activities (anything that consumes or produces commodities), investments, and plans (linear combinations, over time, of activities and investments, e.g. a farm model). The programme computes commodities and investment for a given plan (on a yearly basis, possibly with some analysis within the year), in quantities or values, down to internal rate or return. Additional non standard calculations can be performed on the results using a "Project Data Manipulation Package."

MANIP free

Computer	Hardware	Op. System	Vendor:
	V.M. 256K RAM	Sintran-III	FAO Investment Center
	80 col CRT	PASCAL	Via delle Terme di Caracalla
	132 col printer		00100 Rome

ITALY

MANIP is a Project Data Manipulation Package. It is designed to receive basic assumptions and data about an agricultural development project and calculate various result data. It starts with data including project life in years, the variables or lines to be included in the calculations (number of tractors, hectares of maize, etc.), their values at the start of the project, the way their values are expected to change over the length of the project, etc. The types of output are varied but include project costs and revenues for each year, a sensitivity analysis, switching values for opportunity cost of capital, a sensitivity analysis on switching values, and data vectors used in sensitivity analysis. A typical application to a large farm model would give a complete analysis of credit needs, farm production, farm balance sheet, and cash flow for each year of the project. Title and labels can be entered by the user in any language using European alphabets. All operations are menu driven.

MULBUD 400.00

Computer	Hardware	Op. System	Vendor:
IBM PC	64K RAM	CP/M 2.2	Dr. Dan Etherington
CP/M	2 disk drives		Development Studies Centre
OSBORNE	80 col CRT		Box 4, P.O.
Xerox 820			Canberra, ACT 2600
			Australia

MULBUD is a special purpose software program designed to assist in the economic analysis of complex, long term, land use systems. The name is an acronym for multi-period, multi-crop, budgeting. It provides a simple, straight-forward partial budgeting tool for researchers and planners working on tree (perennial) crops in developing countries who have no previous experience of computers and

probably minimal training in economics. The program is extremely "user-friendly," "fail-safe," and "obvious." The fundamental building block is the individual (monocrop) minimum consistent crop data set which the user specifies by responding to a series of questions. MULBUD can then build multi-crop budgets with temporal and area options. Monocrop or multi-crop budgets are displayed in "final report" format with appropriate economic indicators and flexible, user-defined, sensitivity analysis. The package comprises ten modules which total 250K 8-bit bytes in size. It operates on 280 microcomputers running the CP/M operating system with 64K bytes on RAM memory. MULBUD does not give solutions, it gives alternatives. It is an interactive, user-driven, simulation tool rather than an optimising algorithm. It is as positive as a slide-rule so provides no normative answers. Development of MULBUD has been a joint Australian National University(ANU)/ICRAF project, funded by the ANU and the International Development and Research Centre (IDRC) of Canada.

Pedigree

Computer	Hardware	Op. System	Vendor:
CP/M	2 Drives	CP/M	Saint Benedicts Farm
Heath	48K RAM	CBasic	P.O. Box 336
Zenith			Waelder, TX 78959
			USA

Pedigree is a package for constructing and maintaining a datafile of annotated pedigree for up to 5 generations of animals.

Plant Selector

Computer	Hardware	Op. System	Vendor:
TRS-80 I			Molimerx Ltd.
TRS-80 III			1 Buckhurst Rd
			Town Hall Square
			Bexhill-on-Sea, E. Sussex
			G. Britain

This is a data base for British garden plants, but with very little work could be converted to a small germplasm bank program. This would simply require a change in headings used in the program. There may be as many as 12000 entries and each classified by form characteristics (each character has 4-8 possibilities). If you need a cheap germplasm databank storage program for a small collection, this may help.

Professional Rations

Computer	Hardware	Op. System	Vendor:
CP/M	2 Drives	CP/M	Agricultural Computer Applctns
Heath	64K RAM	Microsoft Fortn	504 Hermosa Place
Zenith			Davis, CA 95616
			USA

Although other ration formulation packages have not been included, Professional Rations seems to fill an area that the others do not. Instead of being written for a certain species it is a general ration formulation package. Up to 40 ingredients can be managed with a maximum of 45 different nutrients per ingredient. Two minimum and two maximum limits can be set for each ingredient, nutrient and group of nutrients. As many as six rations can be defined for

nutrients, ingredients and groups of ingredients. It is possible to set up a copy of the program for a single species and just change parameters as needed. It is a menu driven package. Because it is so flexible it is potentially very useful for developing country use. There are few ready made programs for calculating rations for water buffaloes or llamas and this package will allow such calculations on a routine basis.

Project Scheduler US\$ 285

Computer	Hardware	Op. System	Vendor:
IBM PC	2 disk drives	MS-DOS	Scitor Corp
	192K RAM		Bldg 7
			256 Gibraltar Dr.
			Sunnyvale, CA 94089
			USA

Project Scheduler user the Critical Path Method to produce Gantt charts of project progress. It can include up to 24 resources per project. Report totals can be written to a DIF file for inclusion with spreadsheets..PF DIS

Task Manager US\$ 395

Computer	Hardware	Op. System	Vendor:
IBM PC	2 disk drives	MS-DOS	Quala
	128K RAM		23026 Frisca Dr.
			Valencia, CA 91355
			USA

The Task Manager is a project manager with capacity for up to 999 jobs per project..PF DIS

Weather Analyst US\$ 59.95

Computer	Hardware	Op. System	Vendor:
TRS-80 III	1 disk drive	Applesoft	Climate Assessment Technology
Apple II	48K RAM	Atari BASIC	Suite 355
Atari		TRS DOS	11550 Fuqua St.
IBM PC			Houston, TX 77034
			USA

The Weather Analyst is a set of programs to store and analyze data for daily rainfall, maximum and minimum temperature. With this daily set of data in the data files, the following types of reports may be produced: precipitation and temperature summary for any month or other period (total, duration from normal, high, low, rainy days, degree days), charts of observed daily temperature/rainfall versus long term normal values, monthly temperature/rainfall for any period, and tables of temperature/rainfall/degree days data for any period.

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