

Section IV

Software

Cromemco has an impressive reputation for the quality of our software and thoroughness of our documentation.

We support our computers with what is unquestionably some of the finest software available. Our Multi-User BASIC, for example, is fast, yet maintains 14 decimal digits of precision while not introducing any round-off error. That's important in financial work, of course, and it's obtained by

using binary-coded decimal arithmetic.

At the same time Cromemco ingenuity and thoroughness have made this a fast-operating BASIC. Just benchmark its speed for yourself.

Notice, too, in the following pages the substantial range of software currently available, including COBOL, FORTRAN IV, RATFOR with FORTRAN, and many others.

CROMEMCO DISK OPERATING SYSTEM (CDOS)

Cromemco disk-based software packages comprise a totally-integrated system running under our CDOS Operating System.

CDOS is the framework through which all disk file management is handled. CDOS features include:

(1) SYSTEM I/O. System Input/Output processing for the console, printer, disk, etc.

(2) FILE MANAGEMENT. Symbolically-named files can be created, erased, opened, and closed. Files can be written to and read from both sequentially and randomly.

(3) CONSOLE PROCESSOR. The Console Processor allows the user to display the disk directory, log on new disks, save new disk files, and rename existing files. Executable files may be run from the console, in batch mode, or from other programs.

(4) READ-AFTER-WRITE. After each record is written to the disk, it is read back to assure data integrity. A disk write error message is displayed if the data is not written properly.

(5) CDOS GENERATOR. The user can generate an operating system to match a particular hardware configuration. In addition to the amount of memory in the system, the user can specify the number, location, and types of disk drives.

The Console Processor includes a number of commands which are intrinsic to CDOS. These are useful for manipulating disk files from the console:

(1) ATTRIBUTES — establishes or changes the allowable file access modes. Erase, Write, and/or Read protection may be specified.

(2) DIRECTORY — lists all or specific disk file names and sizes.

(3) ERASE — deletes files from the disk directory and releases the disk space which the files occupied.

(4) RENAME — changes the file name of an existing file.

(5) SAVE — causes the user area to be saved as a disk file.

(6) TYPE — displays an ASCII disk file on the console (and printer.)

CDOS is supplied on all system disks and is automatically loaded into RAM during boot-up. Also supplied with all systems software disks are a number of CDOS utility programs:

(1) BATCH — allows the user to execute a file of commands from CDOS.

(2) DUMP — displays the contents of an ASCII or binary file in hexadecimal on the console (and printer). A column on the right of the listing is devoted to the ASCII translation of the dump.

(3) INITIALIZE — is used to format disks.

(4) STATUS — displays any errors in the disk directory as well as a summary of the use of disk and RAM space.

(5) WRITE SYSTEM — is used to transfer the boot file from/to the front of the system disk.

(6) TRANSFER — is used to transfer files from a disk or other device to another disk or other device.

(7) SCREEN EDITOR — is an easy-to-use screen-oriented text editor. SCREEN is ideal for those who are not familiar with the use of a computer, since it continuously prompts the user with the available commands, always displaying a full screen of text. SCREEN may be used in conjunction with the Cromemco FORMATTER to yield a powerful Word Processing System. Note that SCREEN is designed for use *only* with Cromemco terminals.

(8) TEXT EDITOR — is a conventional character-oriented text editor. It incorporates many powerful features and allows conditional as well as multiple replacements throughout the file being edited.

COBOL Compiler



COBOL

The Cromemco COBOL compiler contains all of the features of Level 1 COBOL as required by the 1974 American National Standard (ANSI) X3.23-1974 as well as the most useful options of Level 2.

The Level 1 features include the standard Nucleus, Sequential Files, and Table Handling. RELATIVE, INDEXED, and SEQUENTIAL files may be used. The COPY statement speeds program development by allowing the programmer to include source libraries. Our COBOL also supports COMPUTATIONAL-3 data to give more compact storage of decimal data on a disk (by packing 2 digits per byte).

Powerful Level 2 features of Cromemco COBOL are:

- COMPUTE — simplifies computations by combining multiple arithmetic statements.
- OPEN EXTEND — permits you to add records to an existing sequential file without first copying all previous records to a new file.
- CALL — to execute your standard, pre-compiled routines with a single statement.
- STRING—easily combines several data items into one field.

UNSTRING — easily separates one data item into several fields.

For rapid error isolation, our COBOL also includes EXHIBIT, READY, TRACE, and RESET TRACE.

Another important feature is that the compiled code is relocatable and uses the same relocatable code format as our FORTRAN IV and our Macro Assembler. This means that segments of programs written in FORTRAN or Assembly Language may be easily called from a COBOL program.

Since COBOL is the most popular language now in use for business application programming, Cromemco computers with COBOL are particularly well suited to business applications.

PRICES

| | |
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| COBOL Compiler on 5" diskette (Model FDC-S) | \$95 |
| COBOL Compiler on 8" diskette (Model FDC-L) | \$95 |

ANSI-Standard FORTRAN IV Compiler



CROMEMCO FORTRAN IV

Cromemco FORTRAN IV provides new capabilities for users of Z-80 based microcomputer systems. This is a complete implementation of ANSI standard FORTRAN X3.9-1966, except that there is no complex data type and specification statements must appear in a specific order. Users can therefore take advantage of the large number of application programs already written in FORTRAN.

Cromemco FORTRAN IV operates under the CDOS Operating System and provides both sequential and random disk file access. Files may be named at run time by use of the CALL OPEN statement. The ENCODE and DECODE statements provide the user with formatted data transfer within memory.

Variables may be declared as DOUBLE PRECISION for full 16-decimal digit precision. Other available data types include BYTE, LOGICAL*1, LOGICAL*2, INTEGER*1, INTEGER*2, REAL*4, and

REAL*8. For ease in coding, our FORTRAN allows the literal form of Hollerith data; that is, literals may be enclosed in apostrophes.

Since Cromemco FORTRAN IV produces relocatable code, FORTRAN modules may be linked with the code produced by the Cromemco Relocatable Assembler, and the Assembler can access scientific and arithmetic routines located in the FORTRAN IV library. This library is searched by the linker to resolve any undefined subroutine calls. This means that only the specific subroutines and system routines required to run a Cromemco FORTRAN program are loaded before execution.

PRICES

All disk software packages include manual and complete documentation.

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| FORTTRAN IV on 5" disk (Model FDF-S) | \$95 |
| FORTTRAN IV on 8" disk (Model FDF-L) | \$95 |

RATFOR/FORTRAN IV



RATFOR WITH FORTRAN IV

Cromemco RATFOR (an acronym for RAtional FORtran) is a FORTRAN preprocessor that brings the advantages of structured programming techniques to the widely used FORTRAN language.

The new structures allowed in RATFOR include:

- BREAK — exits from a loop.
- NEXT — skips remainder of a loop.
- IF-ELSE — branch implementation.
- REPEAT-UNTIL — loop with test at end.
- WHILE — loop with test at beginning.

The RATFOR preprocessor produces FORTRAN IV code that can be compiled by the Cromemco FORTRAN compiler included with this software package.

The FORTRAN code produced by the RATFOR preprocessor is indented, for easily readability, in

accordance with block-structured principles.

The RATFOR software package includes:

- (1) A copy of the RATFOR preprocessor and support programs.
- (2) The RATFOR reference manual.
- (3) The RATFOR book, *Software Tools* by Kernighan and Plauger.
- (4) Cromemco's FORTRAN IV compiler with LINK, the linking loader.
- (5) The Cromemco FORTRAN IV instruction manual.

PRICES

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|-------------------------------|-------|
| On 5" disk (Model FDR-S)..... | \$195 |
| On 8" disk (Model FDR-L)..... | \$195 |

Z-80 Relocatable Macro Assembler



Z-80 MACRO RELOCATING ASSEMBLER

The Cromemco Z-80 Macro Assembler is a two-pass assembler which reads source code from a disk file, assembles it, and produces listings and an object file either in relocatable or in Intel hex format. It is both a Macro and Conditional Assembler.

LINK, the Cromemco Relocating Linker/Loader, may then be used to load the assembled code into memory and resolve any external references. The completely assembled and linked machine code may then be saved in a disk file for execution. The assembler and linking loader allow one to create and assemble a number of different modules separately, and then link them together as desired at run-time. These modules may include FORTRAN Library routines as well as those generated by the FORTRAN and COBOL computers.

Also included on the assembler disk is DEBUG, a support program which allows machine language programs to be traced, disassembled, patched, or programmed into PROM. DEBUG also allows the user to establish break points, display and alter the Z-80 registers, and initiate normal or step-by-step program execution.

PRICES

All disk software packages include manual and complete documentation.

| | |
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| Z-80 Assembler on 5" disk (Model FDA-S) | \$95 |
| Z-80 Assembler on 8" disk (Model FDA-L) | \$95 |

16K Disk Extended BASIC



CROMEMCO 16K DISK-EXTENDED Z-80 BASIC

Cromemco 16K Disk-Extended BASIC was specifically designed to meet the most demanding requirements of business firms while also providing the flexibility and speed necessary for real-time control applications. It fully utilizes the extensive 158-instruction set of the Z-80 microprocessor to maximize computational precision (a full 14 digits), programming power, and speed of execution.

Some additional features are extended string and sub-string handling capability, PRINT USING for Cobol-like formatted output, TRACEing of program execution, dynamic error trapping, random and sequential disk file access through CDOS, program chaining and overlays, multiple statements per line, renumbering of lines, and direct machine language interaction with INP, OUT, PEEK, POKE, and USR commands.

Other features of this powerful BASIC include:

- A semi-compiling design which combines the best features of both an interpreter and a compiler. This yields exceptionally fast execution times

- Three types of variables:
 - (1) Integer (2 bytes) range +32767 to -32768
 - (2) Short Floating Point (4 bytes) range $\pm 9.99E+62$ to $9.99E-65$, accuracy to 6 digits
 - (3) Long Floating Point (8 bytes) range $\pm 9.99E+62$ to $\pm 9.99E-65$, accuracy 14 digits
- Advanced floppy disk I/O capabilities
- Binary and ASCII storage for both programs and data
- Sequential and random access files
- English language error messages
- Syntax error checking as program is entered
- Dynamic error trapping
- TRACE and immediate mode to facilitate debugging
- Advanced output formatting capabilities
- Advanced string handling capabilities
- Chaining of programs
- Direct machine language interaction

PRICES

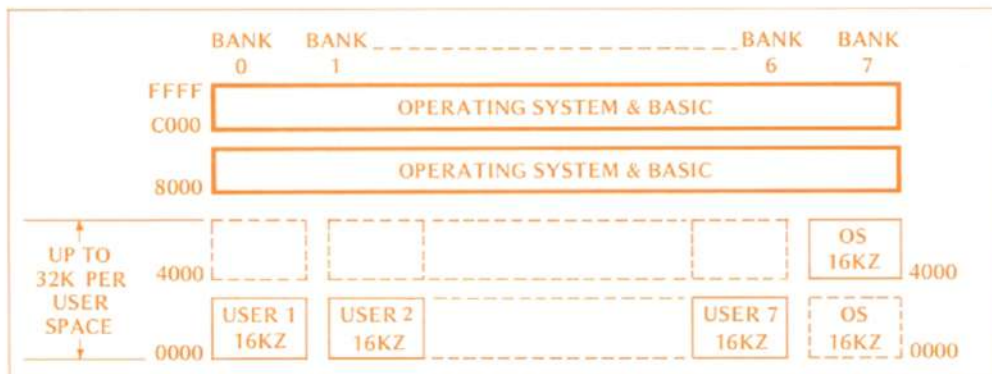
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|--|------|
| 6K BASIC on 5" disk (Model FDB-S) | \$95 |
| 6K BASIC on 8" disk (Model FDB-L) | \$95 |

A complete list of our 16K BASIC instructions set is given below.

Instructions

| Abbreviations: | MODE |
|--|---|
| A, B, C, D variables | INP (IN (n) [25] [range] A, B, ...) |
| INTEGER A (m) (1), B, ... | INT (m) (n) |
| M, N, E, F integers | INP (n) |
| E, F, G, H expressions or variables (n may be relational) | IOSTAT (n) (n) |
| LN, LP line numbers | IRN (n) (range random number generator) |
| LN= statement | LEN (n) (n) |
| LN= special parameter | LET A = E |
| LN= choice line per number (may be renumbered) | LFMODE |
| LN= file number | LET (m) (n) (1) (2) (3) |
| LN= line number | LONG A (m) (1) (2) (3) (4) |
| LN= line after | LOG (m) (n) (n) |
| LN= (do not use with line no. use only with line no. disk data only) | LOAD (m) (n) |
| LN= (do not use with line no. use only with line no. disk data only) | MAX (m) (n) |
| LN= (do not use with line no. use only with line no. disk data only) | NEXT A = E |
| LN= (do not use with line no. use only with line no. disk data only) | NEW (m) (n) |
| LN= (do not use with line no. use only with line no. disk data only) | NOECHO |
| LN= (do not use with line no. use only with line no. disk data only) | NOESC (n) |
| LN= (do not use with line no. use only with line no. disk data only) | NO-TRACE |
| LN= (do not use with line no. use only with line no. disk data only) | ON E (m) (n) (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100) (101) (102) (103) (104) (105) (106) (107) (108) (109) (110) (111) (112) (113) (114) (115) (116) (117) (118) (119) (120) (121) (122) (123) (124) (125) (126) (127) (128) (129) (130) (131) (132) (133) (134) (135) (136) (137) (138) (139) (140) (141) (142) (143) (144) (145) (146) (147) (148) (149) (150) (151) (152) (153) (154) (155) (156) (157) (158) (159) (160) (161) (162) (163) (164) (165) (166) (167) (168) (169) (170) 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Multi-User BASIC



Memory Allocation in Cromemco Multi-User BASIC

MULTI-USER BASIC

This is unquestionably an extraordinary program. First, up to 7 users can independently run BASIC or other programs with this new Multi-User software.

Or, one user can run up to 7 independent programs simultaneously.

This Multi-User BASIC now brings full multi-user AND multi-tasking capability to Cromemco floppy-disk-based computer systems using single-sided, single-density recording format.

Multi-User BASIC is supplied as software-only or as a combination hardware/software package to upgrade a Cromemco System Two or System Three to a 2-user system.

The package includes memory cards with Bank Select, one TRT interface, TU-ART cable, priority interrupt cable, software on diskette, and documentation.

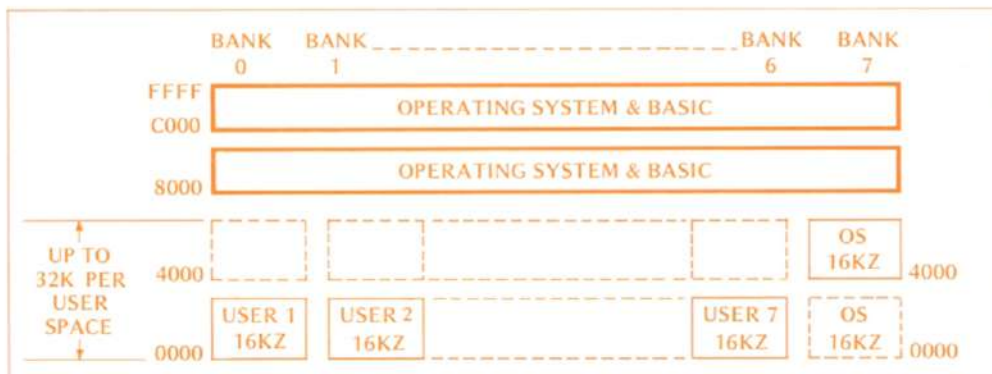
To expand beyond two users, order one 16KZ for each additional user and one TRT for each additional two users.

PRICES

MULTI-USER BASIC on 5" diskette with documentation (Model FDM-S)..... \$800
 MULTI-USER BASIC on 8" diskette with documentation (Model FDM-L)..... \$800

MULTI-USER BASIC: hardware/software package with 5" disk (Model MUB-S).... \$2895
 MULTI-USER BASIC: hardware/software package with 8" disk (Model MUB-L).... \$2895

Multi-User BASIC



Memory Allocation in Cromemco Multi-User BASIC

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MULTI-USER BASIC on 5" diskette with documentation (Model FDM-S)..... \$800
 MULTI-USER BASIC on 8" diskette with documentation (Model FDM-L)..... \$800

MULTI-USER BASIC: hardware/software package with 5" disk (Model MUB-S).... \$2895
 MULTI-USER BASIC: hardware/software package with 8" disk (Model MUB-L).... \$2895

32K Structured BASIC



FEATURES OF CROMEMCO 32K STRUCTURED BASIC

In addition to all of the commands found in Cromemco 16K BASIC the following features and commands will be found in 32K BASIC. This BASIC is designed to run in a Cromemco system with not less than 64K of memory.

Variable names and label names may contain up to 31 characters and may start with an alphabetic character and contain any combination of alphabetic and numeric characters including the apostrophe ('). Line numbers may also be used as label names.

SOPHISTICATED KSAM

A highly sophisticated KSAM (Keyed Sequential Access Method) has been incorporated in Cromemco's 32K BASIC. This feature is very useful in establishing data bases for various applications.

STRUCTURED PROGRAMMING

With the introduction of WHILE and REPEAT loops and the IF - THEN - ELSE instruction group, structured programming in BASIC becomes a reality. This leads to better, more readable code, which in turn leads to faster debugging and easier maintenance of programs and systems.

The interactive program Editor allows the programmer to perform the following functions on one or more program lines:

FIND all occurrences of a string,
CHANGE all or selected occurrences of a specified string, and
EDIT selected lines by inserting or deleting characters.

PROCEDURES are called from memory or a PROCEDURE library and may include both global and local variables. PROCEDURE names may contain up to 31 characters and many start with a period (•) and contain any combination of alphabetic and numeric characters including the apostrophe ('). A PROCEDURE is defined by:

PROCEDURE name (optional calling parameters)

•
code

•
ENDPROC (optional return parameters)—returns from procedure

OR
ERRPROC—sets BASIC error flag and returns from procedure

PRICES

32K Structured BASIC on 5" disk
(Model STB-S) \$295
32K Structured BASIC on 8" disk
(Model STB-L) \$295

SPECIAL STRUCTURED BASIC COMMANDS

EXIT — deletes all active control structures (GOSUB, FOR, WHILE, DO, IF-THEN-ELSE, and REPEAT) on the run time stack up to the most recent procedure call or, if no procedure has been called, up to the beginning of the program.

DELREM — deletes REMark statements for more efficient storage of source files and to allow greater confidentiality of source code.

LVAR — lists all variables and their type as well as the values of scalar arithmetic variables.

IF . . . THEN DO . . . ELSE . . . ENDDO sequence allows the programmer to implement a full IF - THEN - ELSE structure.

COMMON — allows variables to remain in memory as new routines are loaded into memory during execution.

EXPAND — will insert null characters in a string variable so that the programmer can insert characters in the middle of a string.

NOLIST — causes sections of code to become **executable only** code, thereby protecting the security of some sections of code while allowing the user to freely access other sections of code.

CLEAR — will recover user space (memory) from previously deleted lines.

WHILE . . . ENDWHILE loops are an implementation of conditional loops with a test at the start of the loop. It is possible for the WHILE loop to be executed zero times if the condition is not met when the loop is entered.

REPEAT . . . UNTIL loops are an implementation of a conditional loop with the test at the end of the loop. The contents of a REPEAT loop will always be executed at least once.

KSAM ROUTINES

pf — primary file
if — inversion (also called a secondary or alternate file)
fname — file name may be a string or string variable
pfn — file number may be a constant or arithmetic variable
ifn — inversion file number
pkey — primary key may be a string or string variable
skey — secondary key

Initialize and preformat a KSAM file:
KCREATE /pf record length, key length [, Kload space
[, =volumes] /fname **KALTCREAT**/pfn, skey length [, skey
displacement [, =volumes] /fname

Rename (all segments of) a file:

KRENAME old-fname, new-fname

Erase (all segments of) a file:

KERASE fname

Open a file for further processing:

KOPEN /pfn/fname

KALTOPEN /ifn,fn/fname

Close a file:

KCLOSE /pfn/

Get the next, current, or previous record based on the collating sequence of the primary keys:

KGETFWD /pfn/ [item list]

KGETCUR /pfn/ [item list]

KGETBACK /pfn/ [item list]

Read a random record based on the primary key value:

KGETKEY /pfn,pkey/ [item list]

Read the nth record of the file (relative to the first):

KGETREC /pfn,record number/ [item list]

Read additional data from record already referenced:

KGET /pfn/ [item list]

Add a record to the primary file in the proper sequence by primary key:

KADD /pfn,pkey/ [item list]

Add a record to the primary file, preserving the file spacing:

KLOAD /pfn,pkey/ [item list]

Add additional data to an already referenced record:

KPUT /pfn/ [item list]

Change data in a record without changing the primary key:

KUPDATE /pfn,pkey/ [item list]

Delete a record from the primary file:

KDEL /pfn,pkey/

Add, delete, and verify secondary file entries:

KALTADD /ifn/

KALTDDEL /ifn/

KALTVER /ifn/

Read a primary file record based on the secondary key:

KALTCUR (ifn/ [item list]

KALTFWD /ifn/ [item list]

Specify a new secondary key and

read the first corresponding primary file record:

KALTFIRST /ifn,skey/ [item list]

Read the primary key of the current record:

KRETRIEVE /pfn/ string variable

Word Processing System



CROMEMCO WORD PROCESSOR

Example

This text was formatted by the Cromemco Word Processing System. Notice that it is both right and left justified, and preceded by a page title and centered heading.

The user can cause the printed text to conform to the limits of any document. The page size, as well as placement of illustrations, headings, subheadings, use of footnotes and items to be indexed can be easily controlled.

Cromemco's powerful Screen Editor, Formatter, and 3355A fully-formed-character printer can be used in conjunction with each other to form an easy to use Word Processing System which yields professional looking final copy.

The accompanying illustration gives you an example of the variety of styles the Cromemco Word Processor

will give you, i.e., wide or narrow justified columns placed at any point across the page.

WORD PROCESSING SYSTEM

The Cromemco word processing system is a combination Screen Editor and Formatter for the professional preparation of documents.

Lines of text may be left- or right-justified or centered.

Key words can be noted and included in an alphabetized index which is automatically prepared.

The Word Processing system supports multiple columns per page, tabs, footnotes, and user-inserted text (for form letters). Page numbers can go as high as 9999 for long documents.

This word processing system is designed for use on Cromemco System Two or System Three computers with 48K or more of memory.

PRICES

| | |
|--|------|
| WORD PROCESSING SYSTEM on 5" disk (Model WPS-S) | \$95 |
| WORD PROCESSING SYSTEM on 8" disk (Model WPS-L) | \$95 |

Data Base Management System



DATA BASE MANAGEMENT SYSTEM

Cromemco's Data Base Management system is a disk-based system designed to run on Cromemco System Two or System Three computers with 64K of memory.

This advanced software package can be used for mailing lists, inventory control, personnel records, order entry, or other important business applications.

To create a data base an operator simply specifies

the field attributes, and then specifies the sorts by which the data can be retrieved (e.g., by state, by name, by state by city by name, etc.).

The system overcomes the limitations of key-access methods in that multiple keys to the data base can be defined and redefined at any time. Storage space for the key files can be deleted as desired, and recreated at a later time.

PRICES

| | |
|---|------|
| DATA BASE MANAGEMENT SYSTEM on 5" disk (Model DBM-S) | \$95 |
| DATA BASE MANAGEMENT SYSTEM on 8" disk (Model DBM-L) | \$95 |

REPORT WRITING PACKAGE NOW AVAILABLE

New DBR report writing package allows you to prepare special reports from your DBMS files.

| | |
|---|---------|
| Data Base Report on 5" diskette with documentation (Model DBR-S) . . . | \$95.00 |
| Data Base Report on 8" diskette with documentation (Model DBR-S) . . . | \$95.00 |

TRACE System Simulator



TRACE SYSTEM SIMULATOR

TRACE is a powerful software system simulator designed to facilitate assembly language program development.

Virtually all aspects of system operation can be simulated including interrupts and I/O operations. A historical record of the program execu-

tion is maintained in a 100-instruction circular queue.

The advanced features of TRACE enable it to be used as a software substitute for logic analyzers or in-circuit emulators when debugging assembly language programs.

PRICES

All disk software package include manual and complete documentation.

TRACE System Simulator on
5" disk (Model TSS-S) \$95

TRACE System Simulator on
8" disk (Model TSS-L) \$95

LISP



Cromemco LISP is a highly-evolved high-level language used particularly in artificial intelligence work. It is used in such interactive data-base applications as systems that understand natural language, systems for symbolic manipulation of mathematical expressions, intelligent controllers, CAD, and design automation.

Programs in LISP are also used in such work as internal medicine for diagnostic assistance and in geology to assist in interpreting geological data.

Cromemco LISP has a virtual storage capability such that an "autoload" feature allows infrequently-used functions and symbols to be stored on disk, thereby allowing larger user programs.

Comprehensive error-trapping capabilities have also been included in this Cromemco LISP.

In addition, this LISP incorporates many advanced features including standard control constructs such as COND, PROGN, CATCH/THROW, OR, AND, IF DO, LET; complete string and character-processing capabilities; both fixed and floating-point arithmetic; a full complement of property-list functions to provide a powerful tool for constructing data bases; generalized I/O; the capability of interfacing with non-LISP procedures; a comprehensive library with over 150 utility functions; a table-driven, user-modifiable parser that allows the programmer to redefine the scanner and define a new LISP syntax; and MACRO facilities which include READ macros and general macros.

The complete documentation included with Cromemco LISP includes a copy of the book, "Artificial Intelligence Programming."

PRICES

| | |
|--|-------|
| Cromemco LISP on 5" diskette with full documentation (Model LSP-S) | \$295 |
| Cromemco LISP on 8" diskette with full documentation (Model LSP-L) | \$295 |

RPG-II



- Powerful business-oriented language
- IBM compatible

ONLY CROMEMCO OFFERS RPG II

You can now have RPG II, the business language so widely used on larger, costlier machines, for your Cromemco computer.

And our Cromemco RPG II is a full and fast implementation of the RPG II language, modeled after the IBM System 3 implementation.

Further, Cromemco is the only microcomputer manufacturer to offer an IBM-compatible RPG-II compiler.

Yes, this RPG II is fast, reading and compiling statements at a rate of one hundred per minute.

The appeal of RPG II for business use lies in the fact that it is a result-oriented language. Its very name means report program generator and it describes reporting requirements instead of being computer-oriented. It lets you tell the computer what to do rather than how.

RPG II is easy to learn and has been designed for ease of use. Only a few commands are needed to create and maintain files and to generate desired reports.

For more complex applications, RPG II has a complete range of advanced commands that make it as versatile and powerful as COBOL.

Cromemco RPG II supports sequential, indexed-sequential, and direct-access disk files. The compiler also contains powerful table-and array-handling facilities.

It is also capable of calling assembly language subroutines.

Our RPG II has been designed to execute in 64 kilobytes. However, it also has the ability to create a temporary work file on disk to handle compilation of very large programs.

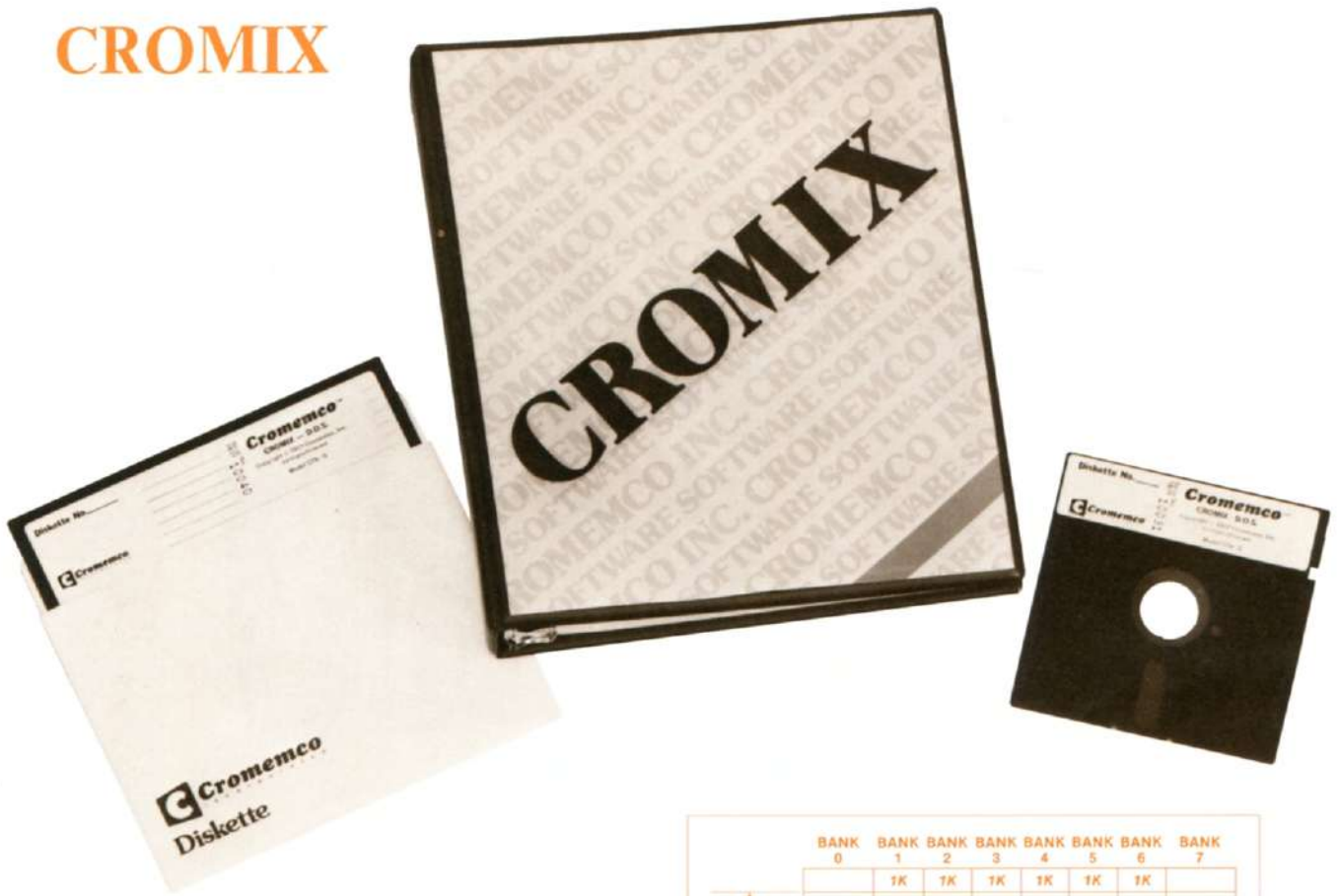
Cromemco RPG II is available on either 5-inch or 8-inch floppy diskettes.

PRICES

Report Program Generator II
on 5-inch diskette with comprehensive documentation
(Model RPG-S)\$595

Report Program Generator II
on 8-inch diskette with comprehensive documentation
(Model RPG-L)\$595

CROMIX



NEW MULTI-USER/TASKING O-S

Cromix is the new Cromemco multi-user, multi-tasking operating system. It supports Cromemco floppy disks and hard disks.

It is a high-speed, high-performance operating system designed to bring a new standard of performance to Cromemco computer systems.

The system supports a new set of Cromix system calls as well as CDOS calls so that programs that use CDOS calls can execute under the Cromix operating system.

| | BANK 0 | BANK 1 | BANK 2 | BANK 3 | BANK 4 | BANK 5 | BANK 6 | BANK 7 |
|---------------------|------------|--------|--------|--------|--------|--------|--------|------------|
| | | 1K | 1K | 1K | 1K | 1K | 1K | |
| UP TO 63 K PER USER | SYSTEM USE | USER 1 | USER 2 | USER 3 | USER 4 | USER 5 | USER 6 | SYSTEM USE |

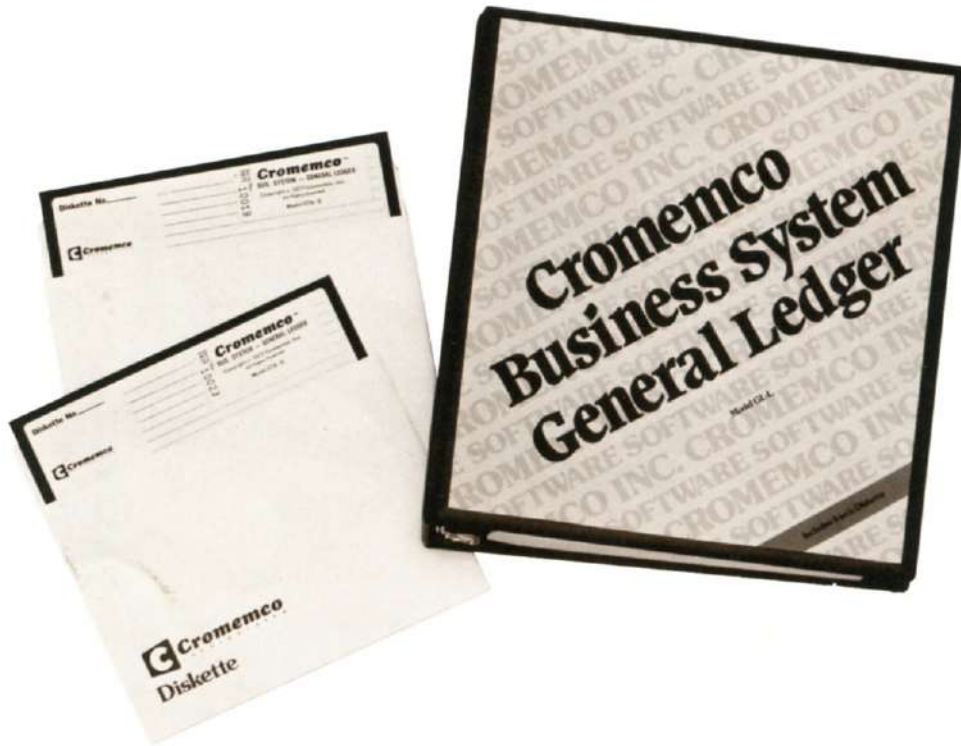
Cromix supports hierarchial directories and a disk address space in excess of one gigabyte. Maximum file size is limited only by the available disk capacity.

The minimum memory required to operate Cromix as a single-user system is 128K bytes. User space is maximized since the system resides in its own bank of memory. One additional 64K memory card must be added for each additional user or task.

PRICE

| | |
|---|-------|
| CROMIX on 5" diskettes with documentation (MODEL CROMIX-S) | \$295 |
| CROMIX on 8" diskettes with documentation (MODEL CROMIX-L) | \$295 |

General Ledger System



- No computer programming knowledge needed
- Part of our integrated Business System Software
- Many special features

TURNKEY SYSTEM

This is a turnkey system that requires no computer programming knowledge whatsoever.

It is intended for use by the business person or accountant, retailer, manufacturer, wholesaler, etc.

This GL System prints over 40 standard GL reports on ordinary computer paper.

Complete double-entry accounting is used and zero balance is automatically maintained at all times. Trial balance reports verify that debits and credits do balance but, more important, they allow audit for human omissions and illogical entries.

Our chart of accounts allows creating custom account structures using either existing numbers or setting up an improved structure. Hundreds of accounts or even more can be maintained. Account numbers have six digits. Provision is made for multi-line descriptions. Optional subaccounts or departmental subdivisions may be used.

There is ample room for expansion. Account balances are maintained for the month in process and for all months of the current and prior year.

This is a high speed, video-based interactive data processing system that requires neither transmittal forms nor punched cards. The system reduces tedious and redundant clerical tasks, and reduces the likelihood of common bookkeeping errors.

Advanced features of the Cromemco General Ledger System include:

- Separate high-speed receipt and disbursement journals

- Default account numbers
- Automatic control numbers
- A powerful multiple-double-entry general journal
- A flexible user-defined financial report generator that allows the user to create his own customized financial statements
- Complete file back-up and restoration capability

As with any computerized accounting system, we recommend that you obtain the advice of your accountant concerning the application of this package in your particular business. We also recommend that computers used in business applications be maintained under a service contract with your local Cromemco dealer.

PRICES

| | |
|--|------------|
| Cromemco General Ledger System on 5" double-sided diskettes (Model GL-S) |\$995 |
| Cromemco General Ledger System on 8" single-sided diskettes (Model GL-L) |\$995 |

Accounts Receivable System



- Saves time
- Saves money
- Keeps track of credit customers
- No computer programming knowledge needed

PRINTS STATEMENTS FOR MAILING

This Accounts Receivable System keeps track of your credit customers, the cash they owe, and permits prompt billing and monitoring of collections.

The system prints statements ready for mailing when our standard statement forms are used. Statements for any customer are optional. Printing of account aging on each statement is also optional. No provision for invoice printing is included.

This system prints over 20 reports. It uses true double-entry accounting and automatically maintains zero balance at all times.

Once an invoice is entered into the system it remains there until it is removed or closed by a payment or an adjustment, regardless of the time involved. There are provisions for inputting up to 800 and even more invoices per month and numerous customers on each on-line file.

This AR System can also be used with our GL (General Ledger) System. Financial totals from the AR will automatically flow into the GL System each month.

This is a sophisticated turnkey package for experienced accountants, controllers, etc. No computer programming knowledge whatsoever is needed, however.

The AR System provides for creating and editing a "customer file." After input of outgoing invoices and customer payments, invoice dollars can be constantly monitored, and aged journals and customer reports generated. As mentioned above, an entered invoice remains in the system until it is specifically removed.

Advanced features of the new Cromemco AR System include:

- Cash discount

- Late payment or finance charge
- Credit memo
- Debit memo
- Partial payment
and
- Bounced check provision

The AR System can also be used with our General Ledger System. Financial totals from the AR System will automatically flow into the GL System each month.

The AR System is a sophisticated turnkey package for experienced accountants, controllers, etc. Some accounting knowledge is preferable but not mandatory. No computer programming knowledge whatsoever is needed.

As with any computerized accounting system, we recommend that you obtain the advice of your accountant concerning the application of this package in your particular business. We also recommend that computers used in business applications be maintained under a service contract with your local Cromemco dealer.

PRICES

- Cromemco Accounts Receivable System on 5" double-sided diskettes (Cromemco Model AR-S) \$995
- Cromemco Accounts Receivable System on 8" single-sided diskettes (Cromemco Model AR-L) \$995

Accounts Payable System



- **Helps preserve cash**
- **Automatic accounting and check-writing**

This new Accounts Payable System helps keep track of vendors (suppliers) and their invoices, writes payables checks as appropriate, and provides summaries and reports for you.

The system provides for the creation and editing of a "vendor file," and the processing of invoices received from those vendors.

There is room for up to 800 and even more invoices per month and for several hundred or more vendors on each on-line file.

Using our check forms, this AP system will calculate and print checks that are fully protected with spelled-out amounts. Otherwise, it prints facsimile checks for manual transcription to actual checks.

The operator can select for payment all invoices and credit memos having a scheduled payment date prior to a certain date, or he can select all invoices from a specific vendor. A single check may pay, and list on its voucher stub, any number of invoices and credit memos being paid.

Our AP System produces over 15 other accurate and attractive reports. It uses true double-entry accounting and automatically maintains zero balance at all times.

When the AP System is used with our General Ledger System, financial totals from the AP System will automatically flow into the GL System each month. The design and operation of the system parallels that of our AR System so personnel learning one system will find it easy to learn and use the other.

This is a sophisticated turnkey system for experienced accountants, controllers, etc. Some accounting knowledge is preferable but not mandatory. No computer programming knowledge whatsoever is needed.

Other features of the Cromemco AP System include:

- Cash discount
- Finance charge
- Credit memo
- Debit memo
- Partial payment
and
- Manually-written check provision
- Password protection of credit information and check-writing procedures
- Complete file back-up and restoration capability

As with any computerized accounting system, we recommend that you obtain the advice of your accountant concerning the application of this package in your particular business. We also recommend that computers used in business applications be maintained under a service contract with your local Cromemco dealer.

PRICES

| | |
|--|-------|
| Cromemco Accounts Payable System on 5" double-sided diskettes (Model AP-S) | \$995 |
| Cromemco Accounts Payable System on 8" single-sided diskettes (Model AP-L) | \$995 |

Inventory System



- Helps achieve better control of inventory
- Helps conserve cash

ALSO SIMPLIFIES PHYSICAL INVENTORY

The Cromemco Inventory System simplifies and speeds inventory monitoring. It is especially suited to the small retailer or manufacturer who requires accurate monthly and annual inventory reports. It will handle up to 2000 and even many more parts.

Once established, the Inventory Master File contains a record for each inventory stock item. Costs, prices, descriptions and size or unit information within each of these records allow printing of price lists and margin analysis reports.

The IN System also simplifies taking physical inventory. Book inventory levels can be quickly adjusted to match physical levels. Since minimum and maximum stock levels are recorded in the system, it will print suggested purchases and report oversupplies.

The system can separately monitor ABC inventory classes, and up to nine different financial inventory groups.

The IN System generates over 25 reports. No special forms need to be purchased.

This is a sophisticated turnkey system for accountants, and experienced purchasing, receiving, stockroom and shipping personnel. No accounting or computer programming knowledge whatsoever is needed.

Other features of the IN System include:

- Part numbers from 1 to 15 characters long

- Reports sorted by part number or by primary vendor
- Reports of month-to-date and year-to-date usages, costs, and sales
- Password protection of sensitive margin and cost data
- Direct on-line inventory status inquiry
- Complete file back-up and restoration capability.

As with any computerized accounting system, we recommend that you obtain the advice of your accountant concerning the application of this package in your particular business. We also recommend that computers used in business applications be maintained under a service contract with your local Cromemco dealer.

PRICES

| | |
|---|-------|
| Cromemco Inventory System on 5" double-sided diskettes (Model IN-S) | \$995 |
| Cromemco Inventory System on 8" single-sided diskettes (Model IN-L) | \$995 |

SDI Graphics Software



EASY TO USE

This high-resolution color graphics software is easy to use since it uses simple BASIC- and FORTRAN-like commands.

In addition it offers enormous flexibility including a choice of color selection from a color menu of 4096 colors.

The subroutine calls provided are sufficient to fully utilize all the capabilities of the Cromemco SDI high-resolution graphics interface circuit card.

The subroutines allow the user such powerful capabilities as:

- fast line generation
- fast generation of shapes such as circles, rectangles and polygons
- area fill of these shapes in a designated color at video rates
- text generation and rotation
- the ability to open and close windows in the memory page being displayed
- the ability to simulate motion (animation)
- the ability to CLIP which eliminates problems that might arise from trying to plot outside the screen area
- the ability to scale the display area of the work page

This software system is designed to work with Cromemco's 48K two-port and 16K two-port memory boards and will operate with one or two pages of two-port memory. Two pages of 48K bytes of RAM are required for complete utilization of the full range of software options.

The programmer can generate and display an image in high resolution (756 x 482 points) as well as the 16-color medium resolution (378 x 241 points). In addition, the programmer has the choice of plotting explicitly (i.e., specifying within a call all needed location and color information) or implicitly (i.e., specifying needed location information with regard to an implied cursor).

Used with the Cromemco SDI high-resolution graphics interface board, this software package enables the user to select 16 colors for the color map from a color menu of 4096 colors. The contents of any color in the map can be modified by the user with a simple call define color command.

In addition, when programming in FORTRAN or Assembly language, the programmer has the option of creating color maps using the command CMAPGEN.

PRICES

High-Resolution Color Graphics Software package on 5" diskette (Model SGS-S) \$295

High-Resolution Color Graphics Software package on 8" diskette (Model SGS-L) \$295

Resident Software

- 16K Extended BASIC
- 3K Control BASIC
- Monitor



• **CROMEMCO 16K Z-80 BASIC.** This memory-resident version of our powerful 16K BASIC gives you all the features of our disk-based version (except for disk I/O).

This is a complete BASIC with 14 digits of precision, high execution speed, Print Using, Trace and many other capabilities.

16K resident BASIC occupies memory from 8000 through BFFF and is ideal for use as a stand-alone system.

• **CROMEMCO 3K CONTROL BASIC.** This is a compact integer-only BASIC interpreter designed specifically for microcomputer control applications. Control BASIC allows the user to read and write specific memory and I/O locations and call machine language subroutines.

There are 36 commands and functions available. Control BASIC requires 3K of memory space beginning at location E400 hex.

• **CROMEMCO Z-80 MONITOR.** This Monitor is a powerful tool for use in software development. It allows the user to examine and alter register and memory contents, set program breakpoints, move blocks of memory, program PROMs (using the Cromemco BYTESAVER II), and read and punch paper tapes — all under keyboard control.

The Monitor resides in memory space from E000 to E3FF hex. and includes 12 commands.

PRICES

16K BASIC in PROM (Model 16KB-1608) \$400
3K Control BASIC (Model CB-308) in ROM . . \$75
Model ZM-108 in 2708 PROM. \$25

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