WINDOWS WORKSHOP!

SPECIAL! WE TEST MULTIMEDIA PCs & UPGRADES

COMPUTE

DECEMBER 1992

101 GREAT GIFT IDEAS

25 BEST GAMES

ONLINE TRADING

QUATTRO PRO 4.0 FOR DOS

WINDOWS PROGRAMMING

UNDOCUMENTED MICROSOFT

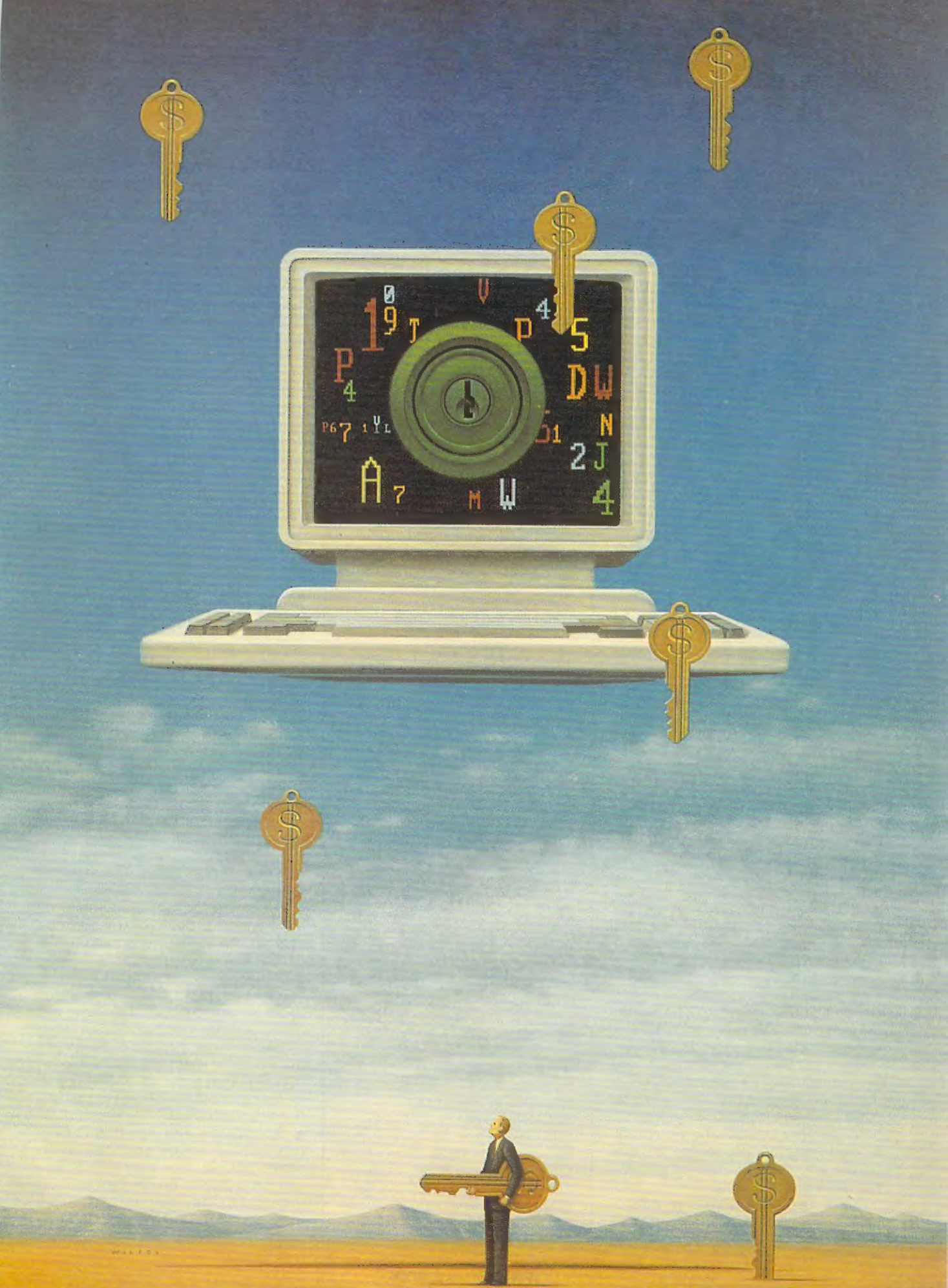
NCR 3170 SAFARI

SCIENCE ADVENTURE

U.S. $2.95

12

0 71486 02193 3



64/128 VIEW

The 64 has always been kind of a barnstorming computer—just plug it in and fly by the seat of your pants.

Tom Netsel

A few months ago in this column, I was lamenting the fact that the number of new releases for the 64 had slowed to a pitiful trickle. Gone are the days when dozens of new titles from major developers vied for space on our review shelf.

In that column I suggested that smaller companies might take advantage of this calm to submit copies of their programs for review. Now that the big houses have moved into the IBM camp, smaller operations with one or two 64 products have a better chance for coverage in Gazette.

I have contacted a number of programmers and small publishers, and several of them have taken me up on my offer. I'm happy to announce that we now have a number of products on their way to our independent reviewers for evaluation. So keep your eye on our review pages next year. We haven't run out of good programs after all.

One small company to respond was Creative Pixels Limited of Library, Pennsylvania. It's a small firm headed by Jim Hilty, who sent a review copy of a new game called The Adventures of Eric Hawthorne, P.I. Hilty has done work in the past for *Ahoy!*, *Commodore* magazine, and *Loadstar*, so he knows his way around a 64. In fact, he's been around long enough to have some insight into the way 64 software has evolved.

"It seems the software development for the 64 has gone full circle," he writes, "from the small independent developer to the big corporate image and now back to individuals. Maybe this is good. The 64 has always been kind of a barnstorming computer anyway—just plug it in and fly by the seat of your pants. It's a fun computer, a truly personal computer, a computer that an individual can enjoy programming, a welcome friend."

Hilty makes some good points. In a way, I suppose the 64 is something like a barnstormer's airplane of yesteryear. It's not too fast, not too fancy—but it's a solid little machine that can still coax an "Ooh!" or an "Ah!" out of onlookers. You can throw a couple of switches, hit a few keys, and dazzle your friends with what it can do. Oh, you may move on to something snazzier, fancier, and faster, but you'll always have fond memories of your first machine.

Creative Pixels is not the only company that still supports the 64. To help our readers track down Commodore products and service, Lisa Hayes, a 64 fan in Chicago, has compiled a buyer's guide of more than 100 such companies. This listing, which has been augmented by the Gazette staff, should prove to be a valuable resource for finding software, hardware, and service for your 64 or 128. You'll find the list on page G-3.

Naturally, in a listing such as this, we're bound to omit some valid companies. I'll apologize in advance if your favorite firm is missing. So if you know of some companies that we've missed or if your firm handles 64 products, contact me. We'll prepare an updated supplement in a future issue. ❐

GAZETTE

PUMP UP YOUR PRODUCTIVITY!

Harness the potential of your 64 and 128 with these powerful programs.

Get more work out of your 64 and 128 with these two new disk products from COMPUTE's Gazette – the 1992 Best of Gazette Utilities, and the Gazette Graphics Grab Bag!

The 1992 Best of Gazette Utilities

Seize control of your operating system and your world!

Here's what's on it–MetaBASIC 64, MetaBASIC 128, Quick, Sprint II, Ultrafont+, RAMDisk 64, RAMDisk 128, BASSEM, SciCalc 64, List Formatter, MegaSqueeze.

The Gazette Graphics Grab Bag

Do it all with Commodore graphics!

Here's what's on it–Starburst Graphics, Screen Designer 128, 128 Graphics Compactor, 64 Animator, VDC Graphics, Dissolve 128, Super Slideshow, 128 Animator, 1526 PrintScreen, Supratechnic, Medium-Resolution Graphics, Screen Maker, GAS!64–Special Edition, GAS!128–Special Edition.

ORDER THEM TODAY!

Extend Your Computer Power With This Powerful Software!

YES! I want to pump up my productivity! Please send me the disks checked below at $11.95 each.

___The 1992 Best of Gazette Utilities

___ The Gazette Graphics Grab Bag

___ Subtotal

___ Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)

___ Shipping and Handling ($2.00 U.S. and Canada, $3.00 surface mail, $5.00 airmail per disk.)

___ **Total Enclosed**

MasterCard and VISA accepted on orders with subtotal over $20.

___ Check or Money Order ___ MasterCard ___ VISA

Credit Card No. _____ Exp. Date _____

Signature _____
(Required)

Daytime Telephone No. _____

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

Mail this coupon to COMPUTE's 1991 Utilities, 324 West Wendover Ave., Ste. 200, Greensboro, NC 27408.

A BUYER'S GUIDE TO COMMODORE SOFTWARE, HARDWARE, AND SERVICES

Since finding items for a Commodore 64 or 128 is not as easy as it once was, we've compiled this listing of manufacturers and of dealers, distributors, and service companies that handle the Commodore line. While this list is by no means definitive, it should make your shopping easier and help you locate some hard-to-find products.

Edited by Lisa Hayes

Software and Hardware Distributors

COMMODORE
1200 Wilson Ave.
West Chester, PA 19380
(215) 431-9100
Customer Support
(800) 448-9987
This is a 24-hour support line.

TENEX
P.O. Box 1813
South Bend, IN 46660-6578
(800) 352-2225
Hardware and software. Free catalog.

BRIWALL
P.O. Box 129
Kutztown, PA 19530
(800) 766-5757
Hardware and software. Free catalog.

SOFTWARE SUPPORT INTERNATIONAL
2700 NE Andresen Rd., Ste.A-10
Vancouver, WA 98661
(800) 356-1179
Hardware and software. Free catalog.

MONTGOMERY-GRANT
P.O. Box 50
Brooklyn, NY 11230
(800) 759-6565
Hardware.

COMPSULT
P.O. Box 3233
San Luis Obispo, CA 93403-3233
(800) 676-6616
Discontinued software at bargain prices. Free catalog.

SOFTWARE DISCOUNTERS INTERNATIONAL
5607 Baum Blvd.
Pittsburgh, PA 15206
(800) 966-7734
New software. Free catalog.

TITUS SOFTWARE
20432 Corisco St.
Chatsworth, CA 91311
(818) 709-3692
New software, mainly European imports.

COSMI
431 N. Figueroa St.
Wilmington, CA 90744
(800) 765-5455
Top 20 Software Tools, Top 20 Solid Gold Games—$14.95 each.

CREATIVE MICRO DESIGNS
50 Industrial Dr.
P.O. Box 646
E. Longmeadow, MA 01028
(800) 638-3263
Hard drives, Jiffy DOS, gateWay, RAMLink, RAMDOS, Swiftlink 232, SID Symphony Stereo Cartridge, and more.

JASON-RANHEIM
3105 Gayle Ln.
Auburn, CA 95603
(800)421-7731
(916) 878-0785
EPROMs, cartridges, and other specialized hardware.

THE GRAPEVINE GROUP
3 Chestnut St.
Suffern, NY 10901
(800) 292-7445
Chips, power supplies, some books and VCR tapes. Free catalog.

SKYLES ELECTRONIC WORKS
231-E S. Whisman Rd.
Mountain View, CA 94041
(800) 227-9998
Hardware and software.

THE SOFT GROUP
P.O. Box 111
Montgomery, IL 60538
(708) 851-6667
Videobyte, Super Video, and more.

8 BIT
P.O. Box 542
Lindenhurst, NY 11757
(516) 957-1110
Closeouts on commercial software. Discount prices. Free catalog.

BROWN BOXES
26 Concord Rd.
Bedford, MA 01730
(617) 275-0090
Quick Brown Box battery-backed RAM cartridges 64K, 128K, and 256K. The Write Stuff word processor, Calc-QBB spreadsheet, and more.

XETEC
2804 Arnold St.
Salina, KS 67401
(913) 827-0685
Hardware and software.

SOFTWARE PLUS
64 W. Cutts
Biddeford, ME 04005
(207) 284-9426
Generic and original programs, hardware, and computer systems. Free catalog.

RIO COMPUTERS
3310 Berwyck St.
Las Vegas, NV 89121
(800) 782-9110
Handyscan 64, MIDI 64, Advanced OCP Art Studio, Advanced Music System, and other products.

GEOWORKS
2150 Shattuck Ave.
Berkeley, CA 94707
(800) 443-0100
GEOS and GEOS-related software.

CODEWARE
Box 3091
Nashua, NH 03061
Radio-oriented software and hardware, also EPROMs. Free information sheet.

ELECTRO-TECH ELECTRONICS
677 E. Main St.
Ventura, CA 93001
(805) 648-5417
Hardware and software. Authorized Commodore dealer and service center.

DELTA COMPUTING TECHNOLOGIES
55 S. Brett St.
Beacon, NY 12508
(800) 227-4051
Hardware.

SCHNEDLER SYSTEMS
P.O. BOX 5964
Asheville, NC 28813
(704) 274-4646
Specialized hardware.

SOFTWARE HUT
2534 S. Broad St.
Philadelphia, PA 19145
(800) 848-0079
(215) 462-2268
Refurbished hardware, also some software. Write for current listing of Commodore products.

COMMODORE REPAIR SHOP
3790 Knight St.
Memphis, TN 38118
(800) 448-9987
New and reconditioned hardware. CRS offers a trade-in program for non-working Commodore equipment. It sometimes even has hard-to-find items. Call for prices and availability.

COMPUTER BARGAIN STORE
3366 S 2300 E
Salt Lake City, UT 84109
(801) 466-8084
Refurbished hardware for the VIC-20 and 64/128. Also software. Send $1.00 for catalog.

HARVEY AND ASSOCIATES
1409 Mill St.
Laramie, WY 82070
(307) 742-3275
New and refurbished hardware and software. Also "The Final Horizon," a monthly newsletter with a bimonthly disk.

J.P. PBM PRODUCTS BY MAIL
P.O. Box 1233
Station B
Weston, ON
Canada M9L 2R9
Refurbished computers, drives, and monitors. Also books, software, CMD products.

TENEX Introduces: AMIGA'S HOTTEST PRODUCTS!

Commodore AMIGA authorized sales & service

Call for Lowest Prices and FREE Software Details!

Amiga 600

Hottest New Amiga!

The new A600 includes AmigaDOS 2 in ROM, enhanced chip set (ECS), built-in connections for TV or monitors, built-in floppy, connection for internal hard drive, mouse, & much more! Choose from two models: Amiga 600 and the Amiga 600HD which has the same features as the A600 PLUS a 40 MByte Hard Drive!

CALL FOR LOWE$T PRICE!

Amiga 570 CD-ROM DRIVE for A500

CDTV Compatible! Includes A500 Upgrade! FREE Software!

At last the long-awaited A570 External CD-ROM drive for the A500 is here! Plays CDTV discs, standard audio CDs, CD+Graphics discs, as well as many ISO-9660 format discs for IBM & Mac computers. With over 600 megabytes of storage on each CD, you'll be able to play games with incredible sights and sounds, use encyclopedias and other research tools, and much more. Call for details on included software and A500 upgrade!

CALL FOR LOWE$T PRICE!

Amiga 500 Computer

TENEX sells more Amiga 500s than anyone else in the country! Call for lowest prices & special software bundles!

Hot Printer Values!

$179.95

STAR NX-1020 RAINBOW

Enjoy vibrant color output, with easy handling! Choose from three print modes: high-speed draft at 225cps, draft at 180cps, and near-letter-quality at 75cps. Features include a big 16KByte buffer, six resident fonts, 15 convenient front panel controls, the ability to print on four-part forms, a side panel interface for interference-free paper movement, and more! Download as many as 255 characters for creating unique logos and fonts. You get Epson FX and IBM Proprinter III emulation. Two-year warranty.

		Sug. Retail $329.00
NX-1020 Rainbow	A51027	$179.95

$136.99

STAR NX-1001 Multi-Font

This 9-wire, dot matrix model provides versatility at a great price. Quietly print in near-letter-quality at 75cps. Choose top or rear paper paths and five resident fonts-Draft, Courier, Sans Serif, and Orator 1 & 2. Download 192 characters for designing custom fonts and logos. Your versatility is extended further with the ability to clear the 4KByte buffer with the push of a button. Two-year warranty.

		Sug. Retail $249.00
NX-1001 Multi-Font	90895	$136.99

OTHER PRINTERS

Star NX-2420 Rainbow	A51047	$284.95
Star LaserPrinter 4	A57934	$799.00
Star NX-2430 Multi-font	98734	$229.95
Panasonic KX-P2180	A68846	$179.95
Panasonic KX-P1180i	A68584	$159.95
Panasonic KX-P2123	A72449	$249.95
Panasonic KX-P1124i	A57112	$289.95
Panasonic KX-P1123	A57108	$199.95
Panasonic KX-P4410 Laser	A71385	$649.95

CARDPRINT G-WIZ INTERFACE.

Connect any printer to your C64/128. Dumps high-res screens up to 18 times faster than competitive interfaces without buffers. 90-day warranty. From Supra.

		Sug. Retail $69.95
G-Wiz Interface	34484	$39.95

Commodore 64 Computer

Only $149.95

Factory New!

Commodore 1541 II Disk Drive

Only $169.95

Factory New!

Don't miss out on the lowest prices on the Amiga 500, plus a full line of Commodore and Amiga hardware, software, and accessories. Call today to receive your FREE catalog with the greatest prices on the most popular hardware and software!

IMPORTANT NOTE

All of our products are brand new and factory fresh! Don't be fooled by reconditioned products or off-brand substitutes. Trust TENEX to bring you the best quality at outstanding prices!

VISA MasterCard DISCOVER

Shipping, Handling, Insurance

Order Amount	Charge
less than $19.99	$4.95
$20.00-$39.99	$5.95
$40.00-$74.99	$6.95
$75.00-$99.99	$7.95
$100.00-$149.99	$9.95
$150.00-$299.99	$10.95
$300.00-$499.00	$12.95
$500.00-$699.99	$19.95
$700.00-$999.99	$27.95
$1000 & Over	2.8% of Order

TENEX Computer Express

56800 Magnetic Drive
Mishawaka, IN 46545
(219)259-7051 FAX (219)259-0300
We gladly accept mail orders!
Circle Reader Service Number 170

Order Today! Call 1-800-PROMPT-1
(1-800-776-6781)

Circle Reader Service Number 170

G6C

JACK O'ROSES
P.O. Box 144
Middleton, PA 17057
(717) 944-5843
Strategy and campaign games.

TERRAPIN SOFTWARE
400 Riverside St.
Portland, ME 04103
(800) 354-2744
(207) 878-8200
Logo software.

SPARKS ELECTRONICS
5316 S. Ninth St.
St. Joseph, MO 64504
Financial software, including S.E.C. Check Register 128.

SUPERIOR MICRO SYSTEMS
26151 N. Oak Ave.
Mundelein, IL 60060
(708) 566-4647
Lottery software.

FINANCIAL SERVICES MARKETING
500 N. Dallas Bank Tower
12900 Preston Rd.
Dallas, TX 75230
(800) 525-5611
(214) 386-6320
Taxperfect64 is a tax return program that's updated every year—$89.00.

FGM CONNECTION
P.O. Box 2206
Roseburg, OR 97470
Graphics products for the 64, including Fun Graphics Machine—$29.95.

MADMAN SOFTWARE
7610 W. Fifth Ave., Ste. 200
Lakewood, CO 80226
Adventure games.

HORSE FEATHER GRAPHICS
North 27310 Short Rd.
Deer Park, WA 99006-9712
(509) 276-6928
Graphics, borders, and fonts for use with The Print Shop.

EASY BOOKS DISTRIBUTING
P.O. Box 216
Iowa Park, TX 76367-0216
(817) 592-4727
Easy Books-1 is an extensive bookkeeping and financial-analysis program for the 64—$39.95 plus $3.50 shipping and handling.

JACOBSEN SOFTWARE DESIGNS
1590 E. 43rd Ave.
Eugene, OR 97405
(503) 343-8030
Baseball database lets you keep track of your team's statistics—$39.95 plus $2.50 shipping and handling.

CLIPART CUPBOARD
P.O. Box 317774
Cincinnati, OH 45231
Grafix Galore is a disk filled with more than 80 Print Shop–compatible graphics—$11.95.

ANTIGRAV TOOLKIT
P.O. Box 1074
Cambridge, MA 02142
KeyDOS ROM is a chip for the empty slot in your 128 that adds 40 new features to your computer—$32.50. Write for information.

DR. T'S MUSIC SOFTWARE
124 Crescent Rd.
Needham, MA 02194
(617) 455-1454
Music and MIDI software and hardware.

PANKHURST PROGRAMMING
P.O. Box 49135
Montreal, PQ
Canada H1N 3T6
Calc II spreadsheet for the 64—$29.95 plus $4.00 shipping and handling.

G.P. SOFTWARE
P.O. Box 571
W. Long Branch, NJ 07764
Draw and print your graphics in color on your Star NX-1000C printer with Draw-Print in Color—$14.00.

SOGWAP SOFTWARE
115 Bellmont Rd.
Decatur, IN 46733
(219) 724-3900
Bible Search and Big Blue Reader.

COMPUTER BARGAIN STORE
3366 S 2300 E
Salt Lake City, UT 84109
(801) 466-8084
New software for the VIC-20 and 64/128, also some Plus 4 software. Refurbished hardware for the VIC-20 and 64/ 128. Catalog—$1.00.

EMS COMPUTE
4355 Kinney Rd.
Ludington, MI 49431
(616) 845-1540
New and used software. Free catalog.

HOMESPUN
P.O. Box 1064
Estero, FL 33928
Lots of international software, ham radio utilities, high-quality arcade games. Send a stamp for a catalog.

P.A.V.Y. SOFTWARE
P.O. Box 1584
Ballwin, MO 63022
(314) 527-4505
Landmark Computer Bible.

HERMENEUKIA
P.O. Box 98563
Seattle, WA 98198
(800) 55-BIBLE
Bible research and Christian education products. Free catalog.

SILVASOFT
P.O. Box 231
Charlotte, VT 05445
Send a self-addressed, stamped envelope for product line, which includes Maidstone Quest for the 128.

MEI/MICRO CENTER
1100 Steelwwod Rd.
Columbus, OH 43212
(800) 634-3478
Disks, disk holders, printer ribbons, paper, disk mailers.

EASY TECH
2917 Bayview Dr.
Fremont, CA 94538
(800) 582-4044
Chips. Free catalog.

UNICORN ELECTRONICS
10010 Canoga Ave.
Unit B-8
Chatsworth, CA 91311
(800) 824-3432
(818) 341-8833 (inside CA)
Chips. Free catalog.

FREE SPIRIT SOFTWARE
720 Sycamore St.
Columbus, IN 47201
(812) 376-9964
Software.

PERFORMANCE PERIPHERALS
5 Upper Loudon Rd.
Loudonville, NY 12211
Hardware.

ABACUS
5370 52nd St. SE
Grand Rapids, MI 49512
(800) 451-4319
Programming languages, software, and computer books.

VMC SOFTWARE
P.O. Box 326
Cambria Heights, NY 11411
Nuclear Sub Command, a realistic nuclear attack sub simulation—$19.95.

KodeKrakr
761 Meade Ln.
Virginia Beach, VA 23455
Software-security bypass programs and game customizer.

Publications, Books, and Newsletters

COMPUTE
Editorial Office
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408
(919) 275-9809
Subscription Department
P.O. Box 3244
Harlan, IA 51593-2424
(800) 727-6937
Monthly magazine, $9.97 per year. Specify Gazette edition when placing subscription to receive Commodore 64/ 128 edition. Also available, disks and books for the 64/128.

RUN
IDG Communications
Editorial Office
80 Elm St.
Peterborough, NH 03458
(603) 924-9471
Subscription Services
P.O. Box 50295
Boulder, CO 80321-0295
Magazine published bimonthly, $22.97 per year. Hardware, software, and books for sale.

COMPUTER MONTHLY
P.O. Box 7062
Atlanta, GA 30357-9827
Monthly magazine, $15.95 per year. Magazine tries to support all computers, offering columns for old favorites like the 64, TI-99, and TRS-80, as well as for the IBM, Mac, and Amiga.

BUSY BEE USER GROUP
2634 E. Malvern St.
Tucson, AZ 85716
A one-year membership costs $20.00 and includes subscription to newsletter.

FOG INTERNATIONAL
P.O. Box 1030
Dixon, CA 95620
Membership in this CP/M user group costs $40.00 a year and includes subscription to newsletter.

GEOWORLD
38 Santa Ynez St.
Santa Barbara, CA 93103
GEOS publication—$12.00 for 6 issues, $20.00 for 12 issues.

MICROBYTES
2648 S. Kenilworth
Berwin, IL 60402
Quarterly newsletter for the 64/128. Each issue, $2.00.

LOADSTAR
P.O. Box 30008
Shreveport, LA 71130-0008
(800) 831-2694
Monthly software magazine for the 64. Three-month trial subscription—$29.95. Loadstar 128 is a quarterly disk publication for the 128—$39.95.

PARSEC
P.O. Box 111
Salem, MA 01970-0111
New publisher of Twin Cities 128.

ABACUS
5370 52nd St. SE
Grand Rapids, MI 49512
(800) 451-4319
Computer books and software.

NY CIG NEWS
c/o St. Hilda's and St. Hugh's School
619 W. 114 St.
New York, NY 10025
(212) 932-1987
Newsletter—$1.00 for a sample, $10.00 for a year's subscription.

THE FINAL HORIZON
1409 Mill St.
Laramie, WY 82070
(307) 742-3275
Monthly newsletter with a bimonthly disk. Contact FINAL on Q-Link.

COMPSULT
P.O. Box 3233
San Luis Obispo, CA 93403-3233
(800) 676-6616
Software and some books. Free catalog.

REDCAT COMPANY COMPUTER BOOKS
6309 Wiley St.
Hollywood, FL 33023
(305) 983-5684
Books for the 64 and 128. Also titles for older computers.

C64 ALIVE!
P.O. Box 232115
Sacramento, CA 95823
(916) 395-9733 BBS
Disk magazine for the 64. Six issues—$25.00. Also, Club Lite, a British disk magazine. Twelve issues—$50.00.

Repair Facilities

NEW AGE ELECTRONICS
13553 66th St.
Largo, FL 34641
(813) 530-4561
(813) 360-7062 (BBS)
Florida's oldest and largest factory-direct dealer and authorized Commodore repair facility.

TYCOM
503 East St.
Pittsfield, MA 01201
(413) 442-9771
Commodore repairs—$25.00 plus parts. Send computer or drive with name, address, phone number, and description of problem. Tycom will call you with a full estimate.

COMPUTER SHOPPE OF ALABAMA
1310 Second Ave., Ste. C
Cullman, AL 35055
(205) 739-0040
Authorized Commodore repair. Also sells chips, cables, and refurbished hardware.

SOFTWARE HUT
2534 S. Broad St.
Philadelphia, PA 19145
Authorized Commodore repair shop.

HARVEY AND ASSOCIATES
1409 Mill St.
Laramie, WY 82070
(307) 742-3275
Authorized Commodore repair shop.

COMMODORE REPAIR SHOP
3790 Knight St.
Memphis, TN 38118
(800) 448-9987
Authorized repair shop.

J&C REPAIR
P.O. Box 70
Rockton, PA 15856
(814) 583-5996
Flat-rate prices on Commodore repairs with 24-hour turnaround.

INGENIOUS SOFTWARE
2120 W. Main St., Ste. 7
Rapid City, SD 57702
(605) 348-8333
Authorized Commodore repair center. Flat rates. Buys old equipment.

Companies on QuantumLink

The path to that company's area on QuantumLink follows its name.

GEOWORKS
Commodore Software Showcase
GEOS Arena

RUN
Commodore Information Network
News & Reference
RUN

CREATIVE MICRO DESIGNS
Commodore Information Network
Creative Micro Designs

EMS COMPUTE
Can be reached online as EMSCOMPUTE.

HARVEY AND ASSOCIATES
Can be reached online as FINAL.

Only $24.95

FOR THE C64 AND C128 IN 64 MODE

Fun Graphics Machine

FUN GRAPHICS MACHINE (FGM) IS AN "ALL-IN-ONE" GRAPHICS PROGRAM FOR THE C=64. WHAT CAN BE CREATED WITH FGM IS ONLY LIMITED BY YOUR IMAGINATION. JUST A FEW EXAMPLES!

SUPPORTS ALL CMD DRIVES

BUSINESS CARDS
CUSTOM LABELS
VIDEO TITLING
NEWSLETTERS
CALENDARS
DIAGRAMS
POSTERS
FORMS

SIGNS
CHECKS
OVERLAYS
BROCHURES
LETTERHEADS
CERTIFICATES
GREETING CARDS
DISK ENVELOPES

WORKS WITH 1541, 1571 & 1581 DRIVES

FUN GRAPHICS MACHINE SUPPORTS IMPORTING GRAPHICS AND HI-RES SCREENS FROM MANY POPULAR PROGRAMS INCLUDING:

SUPPORTS MULTIPLE DRIVES

KOALA
GEOPAINT
RUNPAINT
PRINT SHOP
ADV OCP ART
VIDEO BYTE II

HANDYSCANNER 64
COMPUTER EYES
PRINTMASTER
NEWSROOM
GEOWRITE
DOODLE

THIS AD CREATED WITH FGM

GEOS SCREENS CAN BE CAPTURED SIMPLY BY RESETTING COMPUTER THEN LOADING THE FUN GRAPHICS MACHINE.

FUN GRAPHICS MACHINE FULL KEYBOARD OVERLAY ---$3.50 EA
PLEASE STATE COMPUTER (C64, C128, SX-64) OR C64 IS SHIPPED

FUN GRAPHICS MACHINE DEMO DISK THIS IS A PREVIEW OF WHAT FUN GRAPHICS MACHINE IS ALL ABOUT----------$2.00

→ FOLLOWING DISKS REQUIRE THE FULL BLOWN VERSION OF FGM ←

FGM FONTS OVER 80 FONTS IN FGM FORMAT----------$5.00
FGM CLIP ART VOL.1 OVER 200 EXCELLENT GRAPHICS-----$8.00
FGM CALENDAR TEMPLATE DAILY, WEEKLY, MONTHLY-------$5.00
FGM OVERLAY TEMPLATE MAKE FULL KEYBOARD OVERLAYS
STATE COMPUTER FOR OVERLAY TEMPLATES OR C64 IS SENT--$5.00
FGM UPDATE DISK V6.4 UPDATES FGM V6.x TO FGM V6.4--$2.00

PLEASE ADD FOR **SHIPPING AND HANDLING** PER ORDER ----$3.50
FOREIGN ORDERS: FOR AIR MAIL ADD ADDITIONAL AS FOLLOWS!
CANADA/MEXICO **$1.00**, AUSTRALIA **$10.00**, ALL OTHERS **$5.00**
U.S. FUNDS ONLY **SORRY NO CHARGE CARDS**

The FGM Connection, P.O.Box 2206, Roseburg, OR. 97470
FOR MORE INFORMATION CALL 503-673-2234

Bible Search 3.2

1. The entire Old & New Testament text on 4-1541/71 disks.
2. An Exhaustive English Concordance on 2-1541/71 disks.
   Indexes every word in the entire Bible; 700,000+ references.
3. Incredible five (5) second look-up time, per/word, per/disk.
4. Instant, automatic spell checking of more than 12,800 words.
5. Wildcard and boolean AND, OR & NOT search options.
6. Search the entire Bible in 5 seconds with 1581 or HD (v 3.52).
7. Money back guaranteed!

KJV $49.95 | NIV $59.95 | KJV & NIV $90

Includes: C64 & C128 programs; screen, printer and disk output; users guide, disk case. Available on 7-1541/71, or 4-1581 disks.
☞ Any questions? Call or write for more information.
Also available! Amiga, Bible Search

New

Big Blue Reader 128/64 - 4.0

Transfers word processing, text, ASCII, and binary files between C64/128 and IBM PC compatible 360K 5.25" and 720K 3.5" disks.
New Version 4.0 features: Transfers ASCII, PET ASCII and Screen Code files including: WordWriter, PocketWriter, SpeedScript, PaperClip, WriteStuff, GEOS, EasyScript, Fleet System and most others.
Supports drives # 8-30. New Backup (C128) and Format (1571/1581) programs. Reads MS-DOS sub-directories, uses joystick, and more.
Includes C128 & C64 programs. Requires 1571 or 1581 Disk Drive.

Big Blue Reader 128/64 - 4.0 only $44.95
Version 4.0 upgrade, send original BBR disk plus $18.

Order by check, money order, or COD. US funds only.
☞ FREE book rate shipping in US. *No Credit Card orders.*
Canada & Mexico add $4 S/H, Overseas add $10 S/H ($5 BBR)

SOGWAP Software ☎ (219)724-3900
115 Bellmont Road; Decatur, Indiana 46733

The GRAPEVINE GROUP Inc.

COMMODORE UPGRADES

SPECIALS

• COMPUTER SAVER: This C-64 Protection System saves you costly repairs. Over 52% of C-64 failures are caused by malfunctioning power supplies that destroy your computer. Installs in seconds between power supply & C-64. No soldering. 2 year warranty. An absolute must and great seller **$17.95**
• PRINTER PORT ADAPTER by Omnitronix. Avoid obsolescence. Allows you to use any Commodore (C-64) printer on any PC compatible or clone. Does not work with Amiga. **$34.95**

512K RAM EXPANDERS

By special arrangement with Commodore, we are able to purchase at a fantastic price 400 of the original 512K 1750 RAM expander units for your C64 or C128 computer. Now keep up with the latest technology. Upgrade to 512K with a simple plug-in module. Completely compatible and comes with software. If you have a C64 you will need a heavier power supply (4.3 amp), which we will give you for $31.00. C128 users do not need this power supply. This is the original Commodore unit with over 800,000 sold..... **$99.95**
Super 1750 REU CLone (512K) Does not require a larger power supply..**$142.50**

COMMODORE DIAGNOSTICIAN II

Originally developed as a software package, then converted to a readable format, the Diagnostician has become a fantastic seller. With over 38,000 sold worldwide, Diagnostician II utilizes sophisticated cross-reference grids to locate faulty components (ICs) on all C-64 and C1541 computers (C-128/64 mode). Save money and downtime by promptly locating what chip(s) have failed. (No equipment of any kind needed.) Success rate from diagnosis-to-repair is 98%. Includes basic schematic **$6.95**
(Available for Amiga computers with 3½" disk at **$14.95**)

NEW POWER SUPPLIES

• A super-heavy, repairable, "not sealed" C-64 power supply with an output of 4.3 amps (that's over 3x as powerful as the original). Featuring 1 year warranty, ext. fuse, schematics, UL approved..... **$37.95**
(Includes bonus Commodore Diagnostician II (valued @ $6.95)
• **Our Biggest Seller** • 1.8 amp repairable heavy duty supply for C-64. (Over 120,000 sold.)..... **$24.95**

REPLACEMENT/UPGRADE CHIPS & PARTS

6510 CPU	
6526 CIA	
6581 SID	**$9.95** EACH
6567 Video	
PLA 906114	
All 901/225-6-7-9	
4164 (C-64/RAM)	.60
C-128 ROMs Upgrade (set 3)	24.95
C1571 ROM Upgrade (310654-05)	$10.95
C-64 Keyboard (new)	19.95
C64 Cab net (new)	$49.95
Interface Cables #690 C64 to 1541/1571 disk drive	$12.95
#693 C64 to 3 pin RCA (eg. 1084)	$16.95
1541/1571 Drive Alignment	$21.95
Super Graphics by Xetec	$59.50
Service Manuals for C64, C128, 1802, 1084SP, 1541	$21.95

✦ EMERGENCY STARTUP KITS ✦

Save a lot of time and money by repairing your own Commodore computer. All chips are direct socket plug-ins (no soldering). Each kit includes all you need to "start up"/revive your broken computer. Originally blister packed for the government PXs worldwide, this series is now available to you. Total cost savings per kit far exceeds purchasing chips on an individual basis.

KIT #3 (Part #DIA 15) for C64
Symptoms: No power up • Screen lock up • Flashing colors • Game cartridge problems
Contains: ICs #PLA/82S100/906114, 6526, Commodore Diagnositician, Fuse, Chip Puller, 8 RAMs, Schematic, Utility Cartridge & special diagnostic test diskette with 9 programs
An $87.50 value for only $29.95

KIT #4 (Part #DIA 16) for C64
Symptoms: Control Port • Sound • Keyboard • Serial device problems
Contains: ICs #6526, 6581, 8 RAMs, Commodore Diagnostician, Fuse, Chip Puller, Basic Schematic, Utility Cartridge & special diagnostic test diskette with 9 programs
A $79.80 value for only $29.95

KIT #5 (Part #DIA 17) for 1541/1571
Symptoms: Drive runs continuously • Motor won't stop • Read errors • No power up
Contains: ICs #6502, 6522, Fuse Chip Puller, Basic Schematic, Commodore Diagnostician & special diagnostic test diskette with 9 programs
An $70.10 value for only $29.95

VISA MasterCard DISCOVER

Send For Free Catalog
3 CHESTNUT ST., SUFFERN, NY 10901
Order Line 1-800-292-7445 Fax 914-357-6243
Customer Service: 914-368-4242 International Order Line: 914-357-2424
We Ship Worldwide Prices subject to change
Hours: 9-6 E.T. M-F 15% Restocking Charge

Tell a friend you've heard it through the Grapevine.

Circle Reader Service Number 145

Used Software

SOFTWARE SUPPORT INTERNATIONAL
2700 NE Andresen Rd., Suite A-10
Vancouver, WA 98661
(800) 356-1179
Used listing appears in back of regular catalog. Call to see if titles are in. You can get on the waiting list if your item is not available.

CENTSIBLE SOFTWARE
P.O. Box 930
St. Joseph, MO 49085
(616) 428-9096
(616) 429-7211 (BBS)
It's a one-man operation, so prices tend to be a buck or two higher, but the owner tends to have the harder-to-find items and a large inventory. Free catalog updated monthly. Specify computer. BBS listings updated daily. Has a waiting list.

EMS COMPUTE
4355 Kinney Rd.
Ludington, MI 49431
(616) 845-1540
Free listing of used software.

BARE BONES SOFTWARE
940 4th Ave., Ste. 222
Huntington, WV 25701
(800) 638-1123
Used software. Free catalog updated monthly. Specify computer. Also has a waiting list.

CP/M Software

ELLIAM ASSOCIATES
P.O. Box 2664
Atascadero, CA 93423
(805) 466-8440
PD and some commercial software. A 100-page catalog—$10.50.

SOUND POTENTIALS
Box 46V
Brackney, PA 18812
PD catalog—$2.00. Catalog and sample disk (state format)—$15.00.

FOG INTERNATIONAL
P.O. Box 1030
Dixon, CA 95620
The international CP/M user group. Membership is $40.00 and includes a newsletter subscription. Members have several BBSs from which to download. Also, an inexpensive mail-order service is available for those members not near a local FOG BBS.

INCA SOFTWARE SERVICES
9732 Paseo Montril
San Diego, CA 92129
(619) 484-2173
Commercial CP/M-related software. CP/ M Kit 128, Wordstar 4.0, dBASE II, and more. Product list available.

MICROWARE
Box 710942-A
San Diego, CA 92171
CP/M and PD programs for the 64 and 128.

PUBLIC DOMAIN USER GROUP
P.O. Box 1442
Orange Park, FL 32067
PD CP/M software for the 64 and 128.

TORONTO PET USER GROUP (TPUG)
5334 Younge St., Ste. 116
Willowdale, ON
Canada M2N 6M2
(416) 733-2933
This large user group supports all Commodore computers and offers many public domain programs on disk.

CRANBERRY SOFTWARE TOOLS
P.O. Box 681
Princeton Junction, NJ 08550-0681
CP/M for the 64 and 128.

POSEIDON ELECTRONICS
103 Waverly Pl.
New York, NY 10011
(212) 777-9515
Extensive CP/M library. Catalog—$10.00

THE PUBLIC DOMAIN SOFTWARE COPYING COMPANY
33 Gold St., Ste. L-3
New York, NY 10038
(800) 221-7372
Commercial and PD CP/M software.

TRIO
P.O. Box 594
3290 Genesee St.
Cheektowaga, NY 14225-0594
(716) 892-9630
Commercial CP/M software such as Wordstar 4.0

CT COMPUTER ACTIVE
P.O. Box 893
Clinton, OK 73601
(405) 323-5890
CP/M software for the 128.

GEMINI MARKETING
P.O. Box 640
Duvall, WA 98019-0640
CP/M software for the 128.

Public Domain Software

DISKS O' PLENTY
7958 Pines Blvd., Ste. 270A
Pembroke Pines, FL 33024
(305) 963-7750
Call or write for free catalog.

64 DISK CONNECTION
4291 Holland Rd., Ste. 562
Virginia Beach, VA 23452
Send a stamp for free catalog or $2.00 for catalog and 30 sample programs.

DISKOVERIES
P.O. Box 9153
Waukegan, IL 60079
Send stamp for free catalog or $2.00 for sample disk.

8 BIT
P.O. Box 542
Lindenhurst, NY 11757
(516) 957-1110
Free catalog.

BRE Software
352 W. Bedford Ave.
Fresno, CA 93711
(209) 432-3072

MICROWARE
Box 710942-A
San Diego, CA 92171
CP/M and PD programs for the 64 and 128.

CALOKE INDUSTRIES
Box 18477
Raytown, MO 64133
Free PD catalog or $2.00 for catalog and sample disk.

SOFTWARE EXCITEMENT
6475 Crater Lake Hwy.
Central Point, OR 97502
(800) 444-5457
Free catalog.

ORIGINAL PROGRAMS
P.O. Box 14801
Reading, PA 19612
Free catalog. PD and specialty programs.

Miscellaneous

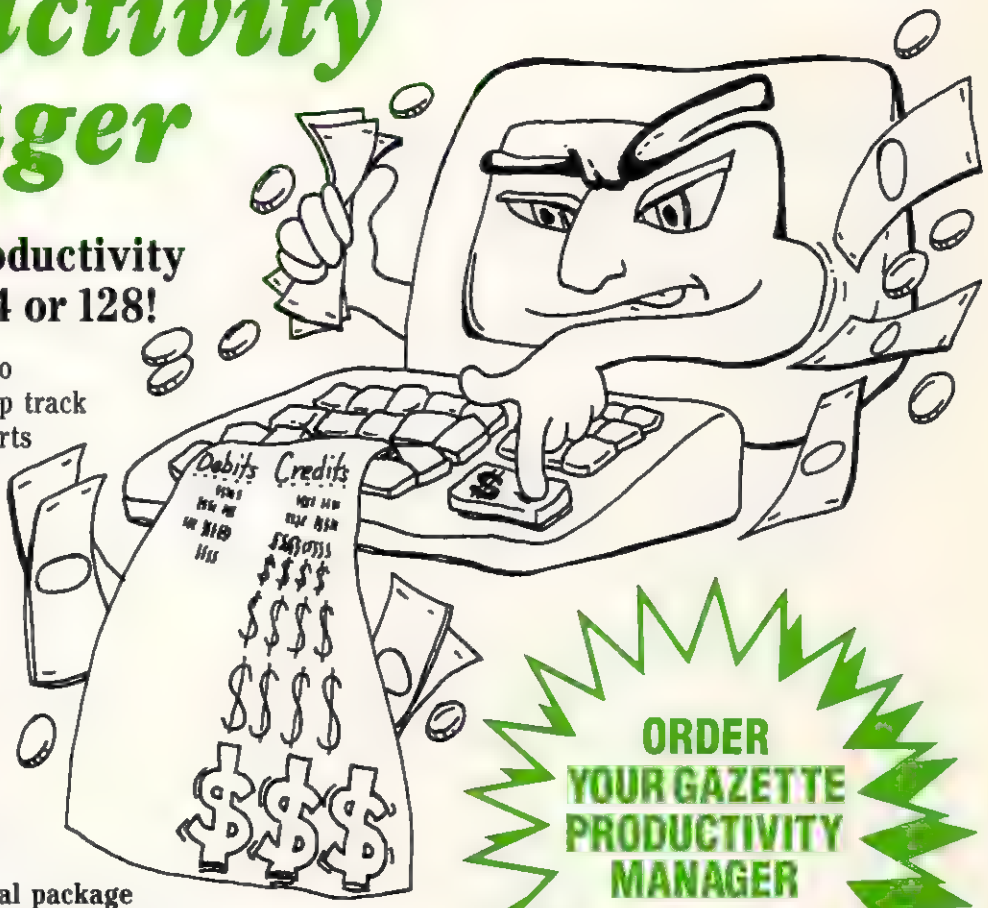
NATIONAL CRISTINA FOUNDATION
(800) CRISTIN
Nonprofit organization that matches donated software and hardware to disabled individuals, schools, and other needy sources.

COMPUTER FOUNDATION FOR HANDICAPPED CHILDREN
2645 E. Southern, Ste.A-326
Tempe, AZ 85282
(602) 831-3519
Numerous programs for a wide range of disabilities. Free catalog and sample disk. Specify 64 or Apple II. ❑

The Gazette Productivity Manager

Harness the productivity power of your 64 or 128!

Turn your Commodore into a powerful workhorse, keep track of finances, generate reports in a snap, manage your money in minutes—all with the *Gazette Productivity Manager!* Look at all your 64/128 *Productivity Manager* disk contains.



GemCalc 64 & 128—A complete, powerful, user-friendly spreadsheet with **all the features you'd expect in an expensive commercial package** (separate 64 and 128 versions are included). Most commands can be performed with a *single* keypress!

Memo Card—Unleashes the power of a full-blown database without the fuss! **Nothing's easier**—it's a truly simple computerized address file. Just type in your data on any one of the index cards. Need to edit? Just use the standard Commodore editing keys. Finished? Just save the data to floppy. What could be easier?

Financial Planner—Answers all of those questions concerning interest, investments, and money management that financial analysts charge big bucks for! You can plan for your children's education and know exactly how much it will cost and how much you need to save every month to reach your goal. Or, decide whether to buy or lease a new car. Use the compound interest and savings function to arrive at accurate estimates of how your money will work for you. **Compute the answer at the click of a key!**

DON'T MISS OUT ON THIS POWERFUL WORKHORSE!

ORDER YOUR GAZETTE PRODUCTIVITY MANAGER TODAY!

(MasterCard and Visa accepted on orders with subtotal over $20).

☐ **YES! Please send me** ___ *Productivity Manager* **disk(s) ($14.95 each).**

_____ **Subtotal**

_____ **Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)**

_____ **Shipping and Handling ($2.00 U.S. and Canada, $3.00 surface mail, $5.00 airmail per disk.)**

_____ **Total Enclosed**

__ **Check or Money Order** __ **MasterCard** __ **VISA**

Credit Card No. _____

Signature _____ (Required)

Daytime Telephone No. _____

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

Send your order to Gazette Productivity Manager, 324 W. Wendover Ave., Ste. 200, Greensboro, NC 27408.

VIDEOFOX

We're living in a video age. Nearly everyone owns a VCR, and judging by the response to television shows like "America's Funniest Home Videos," quite a few people own video cameras as well. Moving into this new electronic way of looking at and recording the world around us is the personal home computer.

High-tech products such as genlocks and frame grabbers let users capture individual frames from a video source or digitize live video segments for use with multimedia presentations. This creative processing of a video source with a computer is called desktop video.

Of course, all this fancy desktop video stuff is out of reach for us 64 users, right? Well, yes and no. There are no genlocks or frame grabbers available for the 64, that's true. All of those high-tech gadgets require a great deal more memory and speed than you'll find on a 64 or 128, but that doesn't mean your 8-bit wonder can't contribute to your video work. You can use the graphics capabilities of your 64 or 128 to create screens that can be copied onto videotape. The hookup is fairly simple, and the results can be every bit as impressive as graphics created on more sophisticated computers.

There are a number of fine programs that provide tools and effects to make your Commodore graphics fade and wipe with the best of them. Each of these packages is designed to take graphic images from your Commodore and run them in sequence while recording the output onto your videotape. Of course, you could create simple animated titles by filming your monitor as you type with a word processor or as your graphics program displays a screen or two. These software packages automate the process and add some nice screen effects, too.

Videofox, imported from Germany and distributed by RIO Computers, is a newcomer to the field of Commodore video software. Videofox is part of the Fox line of Commodore products, which includes the Pagefox cartridge. As a result, Videofox is designed to operate like other products in that line, using a similar point-and-click interface and fonts and clip art files that are interchangeable between programs. The package also includes a full-featured drawing program that lets you design your own bitmap images to import into Videofox.

With Videofox you can create a series of screens that are called boards. The program then displays these boards in sequential order, switching from one to the next using various transition methods. You can adjust variables such as how long each of the boards is displayed and how fast they scroll. The timing of the sequences can be fine-tuned to fit the space you have available on your video.

When satisfied with the effect on the screen, you can connect your computer's output to your VCR and record the results. In this way you can create titles for a videotape. You could also create introductory screens or short animation sequences. Since you can set a sequence to repeat, you could use a series of images as an animated display for a shop window or at a user group computer show. You can have it play from videotape or straight from the computer itself.

Videofox includes a variety of transition options, including some that use the border in unexpected ways. The effects are smooth, professional, and often surprising. You can place text anywhere on the screen and import bitmap images to dress up a display. Any video-titling program offers a selection of fades and wipes between graphic screens, but Videofox does it better, and it gives you more. Transitions are quick and clean—quick enough for some honest-to-goodness page-flipping animation.

Videofox does have a few problems, however. The icons on the screen are somewhat confusing, and they give no indication, either by highlighting or flashing, when they are selected. It's too easy to forget which of the tools is selected, especially when you're not always sure what they're supposed to do. On top of that, some icons are letters of the alphabet. That would be fine if they didn't stand for German words. I had to look them up.

As soon as I did, I encountered another problem. The documentation, haphazardly arranged, is vague and confusing. It also references illustrations and diagrams that apparently are missing from the English version. This situation is made all the worse because the translator obviously knew a lot more about German than about English. The resulting prose ranges from baffling to hilarious.

I have finally figured out what most of the icons do, although I still can't get used to pressing J for *Yes* at prompts. Fortunately, there is a list of keyboard commands that helps. I can't help but wish for a nice tutorial—in real English—that would nurse me through things like importing and placing a bitmap or turning on text mode.

The process of transferring your sequence to videotape is explained as murkily as everything else. This is unfortunate, since that's the whole point of the program. RIO Computers is working on an upgrade to the manual; I hope my registration card entitles me to a new copy.

Despite the documentation's shortcomings, I do like the program. There are plenty of great features here, although they're a bit hard to find at times. I like the continually updated readout of cursor position and the various text effects available. I appreciate the ability to set tab positions on the screen so I can place images in exactly the same spot on each board for smooth, fast animation. Videofox doesn't have the scripting capabilities that Screen F/X has, but its effects are unmatched. Seeing my titles hop, skip, and jump across the screen makes wandering through the foggy documentation worthwhile.

Videofox is amazingly fast. Boards can be displayed so quickly because they're not full-screen bitmaps. Instead, the editor limits you to a certain percentage of the screen, up to 255 cells (8 × 8 pixels each). You can highlight the cells that you've used as you place text and graphics, adjusting when necessary to keep your designs from taking more than the allowable area. This process restricts your creativity to some extent, but the resulting speed makes it worth the effort.

There are a lot of great programs coming from Europe these days. The Fox series is a good example, and Videofox is a decent addition to that col-

lection. Companies like RIO Computers should be commended and supported for importing and distributing these products for the United States market. The problem with translating the documentation is a major stumbling block, however, one which must be overcome before packages like Videofox will appeal to everyone.

STEVE VANDER ARK

Commodore 64 or 128—$59.95
RIO COMPUTERS
3310 Berwyck St
Las Vegas, NV 89121
(800) 782-9110

Circle Reader Service Number 341

INVOICE WRITER II

OK, the Commodore isn't the business computer for the nineties. You won't find some guy in a gray suit powering up a 64 on a 747. The local supermarket won't be running its scanners from a 128 in the back room. Even Commodore itself doesn't use its 8-bit computers to do business.

But every business isn't the corporate equivalent of Mount Everest. There are many small businesses that don't really need a $5,000 computer running $500 software. Small stores and mail-order firms, hole-in-the-wall shops, and baseball card retailers can use what the 64 has to offer: low-cost, efficient computing, with enough features to do the job but not a thousand bells and whistles that boost the price into the stratosphere. All they need is a 64 and some good, solid small business software.

Invoice Writer II is that kind of software. It'll record customer purchases and total the bill, including tax. It then prints the invoice with the business name on top and a friendly note of thanks at the bottom. Invoice Writer II is a winner because it works. It works on a real sales counter with real products, real customers, and real part-time, know-nothing clerks who would crash the system if they could.

When you place your 64 (or 128 in 64 mode) on a counter, connect it to a printer, and run this software, you create an efficient system for handling customer purchases. The main screen uses windows to provide places for the user to enter the customer's name and

Circle Reader Service Number 221

Circle Reader Service Number 252

particulars, the part numbers or short descriptions of the items being purchased, the cost per item, and whether the item is taxable or not. The program will create an invoice for those items, placing a header on top with your company name, address, and whatever else you'd like. An invoice can handle up to ten items, listing them and totaling the final price.

If you need multiple invoices for a purchase of over ten items, the program can add and display their totals. At the bottom of each invoice is a line detailing the transaction. It's all very simple and straightforward (remember that know-nothing part-timer?).

Invoice Writer II also lets you enter negative quantities to include returns or refunds. If the product is multiple-priced, say four for a dollar, and the customer is only buying three, you can enter the price of the full quantity and the quantity purchased as three out of four in the form *3/4*, and the program will do the math.

While creating invoices is the heart of the program, Invoice Writer II doesn't stop there. Recordkeeping is another important part of running a business. As products are sold and invoices generated, the computer keeps a running total of sales. If a second disk drive is available, the program writes this information to a storage disk. Your sales figures are continually updated and recorded. This part of the program, called the Filing System, lets you access old sales records and invoices on any disk by entering a date or range of dates to be printed out. Multiple invoices are coded with a trailing digit so you can be sure of identifying them later.

Should the electrical power fail or that part-timer inadvertently introduce errors into your data, you can edit the saved invoices and figures as needed. As you use Invoice Writer II, you are assured of accurate records stored safely on a disk for review a week, a month, or even years later.

All this makes Invoice Writer II a winner, but the marks of a truly great program are the extra touches it offers. One feature that doesn't have to be there but which makes life easier is Invoice Writer II's ability to operate without a disk drive, once the program has been loaded. This not only frees up limited equipment but also makes the system run quicker. You don't lose your recording capabilities, though; the program simply updates everything later when your drive is available. That's a great touch.

Another example is the invoice-storing system, by which you can stash away up to three unfinished transac-

tions while you work on another. Yet another example is the capability of storing two different printer setups, one for invoices and another for records. This means that you don't need to have the same printer at home or in the back office that you use at the sales counter. It's features like these that make Invoice Writer II a real gem.

Let's get back to that know-nothing part-timer I've been grumbling about. A program that any computerphobic clerk can use must be user-friendly. It's not enough that the program lets you fix errors after they happen; the program must be so simple that anyone can use it. After all, as one offshoot of Murphy's Law so eloquently puts it, "It's impossible to make anything foolproof because fools are so ingenious!" Invoice Writer II is ready for any fool you might have running it.

Aside from the required typing, the program is operated almost exclusively by pressing the unshifted function keys. This speeds up the transaction process. A menu of functions is always displayed on the screen. The manual is well written and concise, giving you not only the basics of operation but also a chapter of tips and tricks to help you get the most out of your 64 as a retail tool.

There is one drawback to the program, however. Each purchased item must be entered from the keyboard—there's no database of products for the invoicing system to access. If entering a part number would automatically generate the description, price, and tax status, that would have been great. Oh, well, I suppose you can't have everything for ten bucks.

STEVE VANDER ARK

Commodore 64 or 128—$10
MAURICE RANDALL
611 Pearl St.
Charlotte, MI 48813
Circle Reader Service Number 342 ❐

Send New Product Announcements and/or Press Releases on your Commodore 64/128 products to:
Tom Netsel c/o
COMPUTE

WORLD VIEW

Geza Lucz

VIEW FROM HUNGARY

Even if you don't know exactly where Hungary is, you've probably heard about paprika and Hungarian goulash. Hungary is about the size of Indiana, with a population of about 10 million people. About 20 percent of the population live in Budapest, the capital.

Being in the Carpathian Basin, a natural crossroads for Eastern and Western Europe, Hungary has always felt a strong pull toward Western Europe, even though it can feel Eastern at times. Around 1988, Hungary reacted to this pull, shifting from a socialist to a capitalist economy.

During the transition to a free-market economy, computers in Hungary have become widely available and much more affordable.

During the transition to a free-market economy, computers have become widely available and much more affordable, in spite of a still-low income level. A Commodore 64, for instance, now costs about 14,000 forints ($180), and the price of a 1541 drive is about the same. For a little more than twice an average monthly salary (39,000 forints or $500), you can purchase an Amiga 500 or an IBM-compatible computer.

Until the late 1980s, computers entering Hungary came primarily through private sales. There were shops in Austria, right across the border, that specialized in Hungarian customers. The big computer boom occurred about seven years ago when the first Hungarian company started selling Commodores, albeit at irrationally high prices.

Thanks to a special government program, elementary and high schools are now online, equipped mostly with Commodores. These computers have proven to be perfect for teaching children how to apply computers to useful purposes. In colleges and universities, IBMs are the standard. There are many in-school networks (Novell), but a linkup between schools is still missing.

Commodore software is usually not available in stores. In spite of this, there are several options by which to update your game pool. There are magazines describing the latest games and utilities. All you have to do is pick out the programs you're interested in and order them. Prices usually range between 200 forints and 400 forints ($3–$6).

You can also go to club meetings and swap programs. The best-known club is Commodore Egyesulet (Commodore Association). It has had its own monthly magazine since 1985. In it, you can find programming tips and software and hardware reviews. This club also collects short programs that are created by members. These help other members learn programming.

There are also workshops where you can have your old computer supercharged. For about 4000 forints ($50), you can have a little electric circuit board added that can increase the speed of your 1541 at least fivefold. You can also get software and hardware that speed up datasettes. Now you can buy four floppy disks for about the price of a good-quality audiotape, and they can store close to the same amount of data, as well.

Available hardware elements range from music digitizers and light pens to the Commodore mouse. In case you're not satisfied with your power supply, you can also buy certain kinds of kits. From these kits and with expertise, you can assemble any equipment in a couple of hours. Finally, for about the price of an IBM AT, you can purchase a bridge card that makes your Amiga 500 compatible with the IBM XT.

Servicing a computer in Hungary may be a difficult task if you don't live close to a major city, but there are many workshops all over the country. Still, sometimes when an expensive integrated circuit breaks down and needs to be exchanged, it's possible that the repair will cost more than a brand-new 64. When you're buying a new computer, some stores may give credit for an old operational or nonoperational computer. In this way they solve their component supply shortage, and you get a certain amount of money for a computer that you probably couldn't have sold otherwise.

Hungarians seem to love their Commodores, as their numbers still increase. It's also true, however, that 64s and 128s have been slowly losing ground to Amigas.

The 64 and 128 have always had the most diverse program pool, with the most games, at the lowest prices. Because of this, they've been the most popular game machines. Since the 64's introduction, children have always wanted it. Now these same children are in college or high school, and many are upgrading and entering the world of IBM.

Another challenge seems to be on the Commodore horizon. The new 10- to 15-year-old generation seems to be buying more Amigas. Flashy graphics, perfect music, and realtime motion seem to be the key words of the nineties. These features, combined with a huge quantity of good-quality programs, make the Amiga 500 a dream machine for Hungarian teenagers.

Basically, the situation in Hungary is a healthy one for Commodore and the business that goes with it. Being a small country with big computer needs, Hungary will probably be staying online with Commodore for years. ❐

ATTENTION USER GROUPS!

WE WANT TO HEAR FROM YOU!

Gazette will soon publish an up-to-date list of Commodore 64/128 user groups across the U.S., throughout Canada, and around the world. We are now in the process of updating this information. If your group did not appear in our last list and you wish to be included, send your club name, address, and bulletin board service telephone number to

Commodore 64/128 User Group Update
COMPUTE's Gazette
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

BEGINNER BASIC

Larry Cotton

GATHERING INFORMATION

Let's look at ways users can enter information into your program.

Suppose you're writing a BASIC program that requires the user to enter something. There are three BASIC commands that accept information from a program's user: GET, WAIT, and INPUT. So which one or ones should you use? Let's look at all three.

GET is probably the easiest and most flexible command to program. Its main disadvantages are that it lacks a blinking cursor and requires extra programming to accept more than one character. Here's GET at its simplest.

```
100 GETA$: IFA$=""THEN100
```

GET (unlike INPUT) doesn't wait for something to be typed unless immediately followed by an IF-THEN statement similar to the above. A$ is an empty (null) string variable until the user presses a key. In this simple execution, A$ will be only one character: a letter, number, or even punctuation mark.

Enter the above line and run it. The computer seems to be frozen in its tracks. Actually it's in a loop within line 100, waiting for the user to press a key. If A$ is empty (the user hasn't hit a key yet), the IF-THEN repeatedly sends control back to the beginning of the line at the rate of at least 100 attempts per second. (To find out how many times GET loops, add a counter in front of the GET. C=C+1 will do it. Run the program; then divide C by the number of seconds the program runs. This slows GET down, so the actual number of GETs is higher.)

GET commands are often followed by more IF-THEN statements which evaluate the entered characters. Here's one way to use GET to form longer strings.

```
100 GETA$: IFA$="" "THEN100
110 IFA$="*"THEN140
120 B$=B$+A$
130 GOTO100
140 PRINTB$
```

Run the program; then hit a few keys. When finished, press the asterisk key. Whatever you typed—almost anything except the asterisk, including spaces and carriage returns—should be printed on the screen.

To rule out everything but one character, say, *T*, do something like this.

```
100 GETA$: IFA$ <> "T"THEN100
```

The symbols <> mean "is not equal to." Multiple IF-THENs often follow GET.

```
90 PRINT "DO YOU WANT TO
   CONTINUE (Y=YES N=NO)?"
100 GETA$: IFA$ <> "Y"THEN
    IFA$ <> "N"THEN100
```

The above routine waits for the user to type either *Y* for yes or *N* for no. It won't move on with any other response. After you present a menu of several numbered choices, you can use GET like this.

```
100 GETA$: IFA$ <> "1"ANDA$<>
    "2"ANDA$<> "3"THEN100
110 IFA$="1"THEN . . .
120 IFA$="2"THEN . . .
130 . . .
```

Notice that IF-THEN isn't needed in line 130. If *3* is typed, control falls through to that line, and another check isn't necessary. As used above, AND takes the place of THEN IF in the preceding example.

An alternative to the above approach is to take the value of A$ (using VAL) and use ON-GOTO.

```
100 GETA$: IFA$<> "1"ANDA$<>
    "2"ANDA$<> "3"THEN100
110 ONVAL(A$)GOTO120,130,140
120 PRINT"YOU PRESSED 1!":
    END
130 PRINT"YOU PRESSED 2!":
    END
140 PRINT"YOU PRESSED 3!"
```

In this particular case, one can use A$ itself to shorten the program.

```
100 GETA$: IFA$<>"1"AND
    A$<>"2"AND
    A$<>"3"THEN100
110 PRINT"YOU PRESSED "A$"!"
```

Suppose you just wanted the user to enter numbers. What's wrong with using a numeric variable like this?

```
100 GETA: IFA=0THEN100
110 PRINTA
```

Nothing—or is it? Enter these lines; then try pressing any number key. No problem! But try typing a letter. Zing! You're rewarded with a error! To minimize problems with numerals, always use GET for a string variable; then use VAL to change the input to a number. If you need numbers larger than a single digit, concatenate the string, as you did in the second example above, and then use VAL.

To finish up, here's a neat trick to eliminate everything but numbers or letters. First, here's the one for numbers.

```
100 GETA$: IFA$<"0" OR
    A$>"9"THEN100
110 PRINTVAL(A$)
```

Yes, greater-than and less-than symbols can be used with A$. They evaluate the ASCII value of the character. Now, let's work with letters.

```
100 GETA$: IFA$<"A" OR
    A$>"Z"THEN100
110 PRINTA$
```

Next month, we'll take a look at the INPUT command. ❐

MACHINE LANGUAGE

Jim Butterfield

ANIMATED CHARACTERS

Animation is always fun, and you can achieve it in a number of ways on your Commodore. You can create image movement by using sprites, turning pixels on and off on a high-resolution screen, or even using graphics characters to write new information to the screen. There's one more method that we'll investigate this month—animating the characters themselves.

That's what we'll do with Charzoom, a program for the 64 or the 128 in 64 mode. Charzoom has a conventional character screen, but it uses a custom character set rather than the standard ROM character base. To do our simple animation, we'll leave the screen data unchanged; instead, we'll modify the appearance of the letter *O* in the character set.

To define custom characters, we must place the whole character set somewhere in memory. I've chosen addresses 49152–51199 ($C000–$C7FF) for the character descriptions. We'll copy these characters from ROM, so you won't notice any difference until we animate one of them, the letter *O*.

All video—screen memory, characters, and sprites—must come from the same quadrant of memory in the 64. For screen memory, I selected 51200–52223 ($C800–$CBFF). You'll see the POKEs to set all this up in the BASIC program; when the program ends, it puts everything back.

The program copies the character set found in ROM at $D000 to our chosen spot in RAM at $C000. Since we must copy 2048 bytes, that's a natural job for machine language. And ML also makes it easy to do another trick—make the character ROM visible.

Here's the problem that we face: Addresses $D000–$D800, where the character ROM resides, are normally the ones used by the I/O chips, CIAs, VIC-2, and SID. To see the characters, we must make the I/O chips disappear. That's fairly easy. We do it by turning off bit 2 of address 1.

But there's another catch. If the I/O chips disappear, even for a moment, we must not allow the IRQ interrupt to strike! This interrupt normally occurs every 1/60 second and does such jobs as checking the keyboard and updating the clock. It couldn't do its work if the I/O chips were gone; in fact, it would cause a system crash. So we lock out the interrupt with an SEI (Set Interrupt Disable), kick out the I/O chips, copy the ROM, and then put everything back and release the interrupt. Nothing to it, once you know how.

You'll find the code to do this in memory at addresses $CC00–$CC28. If you're used to the indirect, indexed addressing mode, there should be no surprises there.

Now let's have some fun. In screen PEEK and POKE terms, the letter *O* is represented by value 15. To find the character drawing, we multiply 15 by 8 (there are eight bytes for each character). Adding the result to our character base starting address, we find that the letter *O* is drawn in the bytes at $C078–$C07F. The first byte contains the pixels for the top of the character; the last byte, the pixels for the bottom.

Our objective, then, is to roll the letter *O* so that it appears to be moving upward. Each pixel line will replace the pixel line above it, except for the top one, which will flip to the bottom. In memory terms, that means each byte of the character description moves down one position, with the bottom one moving to the top.

Machine language is too fast, however. Pixel moves need to be slowed to a rate of, say, ten per second. We achieve this slowdown by counting video raster scans and acting on every sixth scan. This reduction produces a very smooth scrolling effect on the screen.

If you wish to use your disassembler to view the code, you'll find it at $CC29–$CC59. The outermost loop repeats until it detects that a key has been pressed. The middle loop does eight pixel rolls on the *O* character. Two innermost loops are used, with one waiting six raster scans and the second moving the pixels.

There's an extra bonus in using the raster position as a timing control. It ensures that the character won't be modified at the same instant that it's being displayed. That way, we avoid screen jitter or tearing

Animate on a small scale by moving pixels within a single character.

CHARZOOM

```
KX 100 DATA 169,208,162,192,16
       0,0,132,34,132,36,133,3
       5,134,37,120
CD 110 DATA 169,51,133,1,177,3
       4,145,36,200,208,249,23
       0,35,166,37,232
SQ 120 DATA 224,200,208,233,16
       9,55,133,1,88,96
QH 130 DATA 162,0,160,6,173,17
       ,208,205,0,205,141,0,20
       5,176,245,136
PX 140 DATA 208,242,173,120,19
       2,72,185,121,192,153,12
       0,192,200,192,8
HK 150 DATA 208,245,104,141,12
       7,192,232,224,8,208,216
DK 160 DATA 32,228,255,168,240
       ,208,96
MF 200 FOR J=52224 TO 52313
EJ 210 READ X:T=T+X
BP 220 POKE J,X
AE 230 NEXT J
DC 240 IF T<>12735 THEN STOP
XC 300 SYS 52224
QH 310 POKE 56576,4
RX 320 POKE 53272,32
EX 330 POKE 648,200
GH 400 PRINT CHR$(147)
AJ 410 PRINT "COMPUTE MAGAZINE
       "
FK 420 PRINT "{5 SPACES}FOR"
QK 430 PRINT "COMMODORE MAGIC!
       "
MD 440 PRINT
FP 450 PRINT "PRESS ANY KEY TO
         STOP!"
SA 460 SYS 52265
FF 500 POKE 56576,7
CG 510 POKE 53272,20
MP 520 POKE 648,4
```

FEEDBACK

Questions and answers about justified printing, and an enhancement to File Logger

Not Justified

I recently ordered the SpeedScript disk, and I am having trouble with the right-justification function.

I type a letter and print it to disk with Shift+Ctrl+P, as stated in the directions. I run SS Justified and enter the filename of my letter. Having assigned a left margin of 10 and a right margin of 70 on the original letter with l=10 and r=70, I enter 10,70 at the margin prompt as directed and press Return. All I get on my printout is one column of text running down the page. What's wrong?

LYLE PRUETT
HOLTON, KS

Your problem is with your margin settings. It's fortunate that you included a sample of how you set them instead of simply stating that you set the margins to 10 and 70.

The l and r are in reverse type since they were entered after you pressed Ctrl+3 or Ctrl+£. You're making a mistake by including equal signs when setting SpeedScript margins. Do not use the equal signs when setting margins. What you have done by using an equal sign is to make the L key equal CHR$(10) and the R key equal CHR$(70). You haven't changed the margins at all, and your SpeedScript default margins of 5 and 75 remain in effect. So when you tell SS Justified that your margins are 10 and 70, you get the garbled output.

SpeedScript Justified does require you to set the 1 key to CHR$(1) and the 2 key to CHR$(2). To do that, you do need the equal sign. To set the margins, however, omit the equal sign. At the top of a SpeedScript file that you plan to print justified with a left margin of 10 and a right margin of 70, you should have something like the following.

1=1
2=2
l10r70

Then be sure to put the 1 where you want your justification to begin and 2 where you want it to end.

File Logger Revisited

I've just finished loading and testing Roger Bachelder's File Logger program (June 1992) and have come up with an enhancement that will allow the program to handle locked files, those that are protected from being scratched. They normally appear as XXX files, and the starting addresses are omitted. Try entering the following line.

```
425 IF ASC(K$)>191 THEN
    K=ASC(K$+CHR$(0))-
    192: GOTO 440
```

This line may cause the program to crash, however, if it encounters a splat file.

Scratched files also appear as XXX files in the original version. If you don't want deleted files to appear in the listing, enter the following line.

```
375 IF K$="" THEN 520
```

DAVID KLICH
MT. PROSPECT, IL

Saving Data

How can I save data or variables to disk? BASIC's SAVE command doesn't work.

J. S. SAMPLE
FT. PIERCE, FL

It might seem that the logical thing to do when saving variables to disk is to use a command like SAVE "A$",8, but that would only save whatever program was in memory under the filename A$. Unfortunately, variable storage is a bit more complicated than that, but it's very useful when you know how to do it. For example, if you're building a custom database, it often makes sense to have a program for handling the database and a separate disk file for the actual data or information itself.

BASIC commands for manipulating programs don't work with variables. For example, once a program is in memory, you can put it onto the screen with LIST. But you can't list a variable; you must print it.

The SAVE command sends a program to tape or disk; LOAD recalls a saved program. But SAVE and LOAD, like LIST, don't work with variables. They're commands that apply to programs only. Take a look at this example.

```
10 A$ = "John Smith"
20 SAVE A$,8
```

When this program executes, it saves itself to disk under the filename John Smith! If you load and list John Smith, you'll see the above two lines of code.

To save a variable, you must open a file; print the variable, number, or string to the file with PRINT#; and then close the file. Here are a couple of ways to do it.

```
10 A$="THIS IS A TEST"
20 OPEN1,8,2,"TESTFILE,S,W"
30 PRINT#1,A$
40 PRINT#1,"END OF TEST"
50 CLOSE1
```

The first number after OPEN in line 20 is the logical file number, which can be any number from 0 to 127. This number is used later in the PRINT# and CLOSE statements. It's followed by a comma and the device number (a disk drive is device 8). The third number is the secondary address. For disk files, the secondary address specifies the

disk channel which will be used and which must be in the range 2–14. The filename is followed by ,S,W which means it is a sequential file and we are writing to it.

When a disk file is opened, the drive light turns on and stays on until the file is closed. Be sure to close a file when you've finished with it.

Line 30 uses PRINT# to print the A$ variable to the disk, and line 40 illustrates another way to print a string. Line 50 closes the file.

To reverse the process, delete line 10. In line 20 change the S,W to S,R because now we want to read the sequential file rather than write to it. Since we now want to take information (A$) from the disk, instead of PRINT#1, A$ in line 30, we use INPUT#1,A$. That loads A$ into memory, and PRINT A$ prints it onscreen. Since we have two strings on disk, we have to repeat this line to read the second one. Here's a simple routine that will do the job. You can make it more sophisticated, depending on your needs.

```
20 OPEN1,8,2,"TESTFILE,S,W"
30 INPUT#1,A$: PRINT A$
40 INPUT#1,A$: PRINT A$
50 CLOSE1
```

Using INPUT# on strings longer than 80 characters will return a STRING TOO LONG *error. In such a case, use GET# instead. It lets you read sequential files a character at a time. Use a FOR-NEXT loop or GOTO statement to read the entire file.*

File Types

Can you explain the different file types I see whenever I list a disk directory?

TOM GAYNOR
HYDE PARK, NY

The 64's Disk Operating System (DOS) provides for five types of disk files: program files, sequential files, user files, relative files, and deleted files. On a directory they usually appear as PRG, SEQ, USR, and REL. DEL is a deleted file, but it does not appear on a normal directory listing.

When you save a program, your computer has to read through program memory and send information through the cable to the disk drive. The drive could put the program anywhere on the disk, but you wouldn't want it to overwrite other programs or files. So DOS has to keep track of where the programs or other files are. It puts the name of the file into the disk directory, marks it as a program, looks at the Block Allocation Map (BAM) to find some free space on the disk, and then saves the program.

A program file (PRG) is just what the name implies. It's information that was saved as a program. In most cases it contains a BASIC or machine language program. It might contain a section of memory that's been transferred to disk using BASIC's SAVE routine. SpeedScript, for example, saves its text to disk as PRG files. To get the program back into the computer, you use the LOAD command. LOAD works only on PRG files.

A sequential file (SEQ) is most often used for storing information such as mailing lists, inventories, etc. Instead of SAVE, you use OPEN, PRINT#, and CLOSE to write to the file. To read it, use OPEN, INPUT# or GET#, and CLOSE. Information in such files is accessed sequentially starting from the first entry in the file. So to get to item number 319 in a sequential file, you must read through the 318 prior entries.

Relative files (REL) are also used to store information. They're trickier to work with, but they can save a lot of time when you're working with many files. Such files are accessed with the OPEN command, but the data records are numbered. So before you read in the data, you have to position a pointer. This lets you home in on the desired record. To reach record number 319, for example, you just set the pointer to 319, and the disk drive goes straight to that record, rather than searching though all of the previous records. Relative files are faster than sequential files for individual records and don't require much of the computer's memory, because the entire file isn't read in.

Problems with saving variables to disk, and an explanation of file types

USR files have a specialized purpose, and you'll rarely see them used outside of GEOS disks. You can open and write to them as if they were sequential files (replacing the S *for sequential with a* U *for user). Since the VALIDATE command scratches random files, some programmers will create dummy USR files to protect data written to disk. There's also a machine language technique for writing PRG files to USR files.*

A deleted file (DEL) is one which no longer exists in the directory and has no blocks reserved for it in BAM. When you scratch a program or file from the disk, it's not actually erased. The directory entry is marked as a deleted file, and the BAM is updated, freeing the space allocated by the program. The file still exists on the disk until you save or write new information to the blocks occupied by that file. By using a disk editor, you can change the byte in the directory which indicates a deleted file to its original value. Now validate the disk with OPEN15,8,15: PRINT#15, "V0": CLOSE15 to update the BAM and restore the deleted file. ❐

GEOS

Steve Vander Ark

ULTIMATE GEOS (PART 2)

The ultimate GEOS hardware that I selected last month now needs the ultimate in GEOS software.

In last month's column I put together what I consider to be the ultimate GEOS hardware configuration. If you'll recall, it consisted of a flat 128 with the following: a 1571, a CMD FD-4000 high-density 3½-inch drive, a RAMLink loaded with a brain-numbing 16 megs of memory, a CMD 200-meg hard drive, two monitors, and a mouse. I figured I wouldn't need the 64K video RAM that you get with the 128D, since no GEOS program that I knew of made use of it. At the time I made that list, I wasn't sure how I was going to access four drives from GEOS.

Since then, New Horizon Software has released its Landmark Series disk. As a result, I've had to add the extra video RAM since several excellent programs on that disk require it. Landmark Series also presents a possible solution to my four-drive problem with DualTop, a file manager program to replace the deskTop.

Great as this may be, that solution only compounds the difficulties in selecting software for my ultimate GEOS system, which is what I'll do this month. Before I get into that, however, I'll state the obvious and note that we'll be using the 128 GEOS version 2.0.

That part is easy. Now comes the hard part: selecting the file manager software. Why not stick with the deskTop? After all, it's probably the best-known file manager. With the GEOS utilities now available from Creative Micro Designs, the deskTop can handle the various CMD devices that we want to plug into our system. I am sorely tempted to stick with the deskTop, since I'm so familiar with it. But the deskTop can only access CMD devices like RAMLink in 1581-sized chunks, and I'm planning to set up a larger native mode partition rather than chop up that 16 megs. (When I create a bunch of partitions, I always end up placing a lot of duplicate files in each partition, which really wastes space.) On top of that, the deskTop drivers can only access the FD-4000 super drive as 1581 partitions. No, for all its ease of use and cute little icons, the deskTop simply isn't powerful enough to handle the high-tech equipment in our ultimate GEOS system.

So what about DualTop 3.0? It can certainly handle CMD RAM devices, and as I mentioned, it lets you access up to four disk drives. The unique display, showing the directories of two drives simultaneously, is a nice touch, and no file manager software for GEOS can match its speed, especially as it scrolls through a directory.

I realize that icon fans decry the trend away from pictures toward simple lists of filenames, but frankly, you waste a lot of time waiting for the deskTop to draw its little pictures. With DualTop, you can scroll through the alphabetical list of names almost faster than you can read them. DualTop also features a RAM drive priority system. This means that whenever you double-click on a file or document to open it, the system first checks the RAM drives or drives for the application, regardless of where the document is stored, since applications run much faster from the RAM drive.

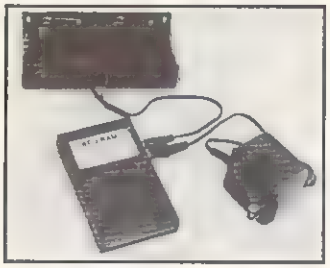
As to its look and feel, DualTop loses a little ground when we compare it to the deskTop or to Gateway, which we'll talk about in a moment. The screen is a bit busy with the two directories showing (a nice feature, but one I seldom need), and operation isn't as intuitive as it is with the deskTop, even with the file operation buttons constantly displayed. And DualTop, like the deskTop, sees RAM devices as drive-emulating partitions only. Even so, DualTop's four-drive support and its RAM drive priority system make it a very strong contender.

Gateway fully supports CMD RAM devices in either drive-emulating or native mode. Drivers written for Gateway allow it to access the FD-4000 drive the way it's supposed to be accessed, as a 3.2-meg wonder, not as two or more 1581 drives. Until recently, however, I wouldn't have been able to recommend Gateway because of the number of bugs still plaguing it, but the program has been reworked by Jim Collette, and it's now bug-free. Gateway has always been intuitive and a joy to use—except when one of those notorious bugs jumped out at you. Now that it's safe, Gateway might just be the way to go. Unfortunately, Gateway won't support four drives, a very big minus for my ultimate system.

Another contender is geoShell, the DOS-style command line interface for GEOS. GeoShell will access four drives, but again only as 1581 partitions. And when it comes to look and feel, well, what can I say? GeoShell isn't a graphics interface at all, and this *is* GEOS, after all.

Do you start to see the problems I had picking this software? I figured I'd just rattle off a few names and be done with it. So where do I turn? I suppose the only way to go is Gateway, since handling three drives completely is better than incompletely handling four. That leaves us with a few more decisions to make, but I've run out of room this month. I guess this ultimate GEOS series will skip along for yet another issue. ❐

NEW PRODUCTS From Makers of RAMDRIVE



BBG RAM

Battery Back-up Ram Disk for GEOS 2.0 and GEOS 128, 2.0

- Magnitudes faster than any floppy or hard drive
- 2 MEG model has capacity of TEN 1541's
- Includes GEOS application to select one of up to five 1571's
- Reboots GEOS from BBG Ram quickly and quietly
- Supplied with wall mount power supply and battery cable and holder
- Automatically detects power out and switches to back-up mode
- Activity light indicates access
- Battery used only when wall mount AC power supply off

INTRODUCTORY PRICE

MODEL 512	1 MEG	2 MEG
$79.00	$110.00	$139.00

BBU

Battery Back-up Interface Module for Commodore 17xx REU's and Berkley Softworks' GEORAM 512

- Reset button without data loss
- Activity indicator light during access
- Battery low voltage indicator
- Wall-mounted power supply and battery holder and cable supplied
- GEOS compatible, allows reboot to GEOS
- Automatic battery back-up, no switches to push
- Battery powers unit only when AC power off
- BBU supplies power to 17xx REU's and GEORAM. Commodore heavy power supply not required

INTRODUCTORY PRICE $49.00

Call: 1-800-925-9774

VISA MasterCard

GEOS registered Trademark of Berkley Softworks, Inc.

PERFORMANCE PERIPHERALS Inc.

5 Upper Loudon Road
Loudonville, New York 12211

Please Add:
U.S. $6.00 S&H
Canada $10.00 S&H
$4.00 C.O.D.

Circle Reader Service Number 153

COMPUTE's SpeedScript Disk

ONLY $11.95

A powerful word processing package for Commodore 64 and 128 owners

A Great Deal for Commodore Users!

- *SpeedScript* for the 64
- *SpeedScript 128*—80-column version
- Spelling checkers
- Mail merge
- Date-and-time stamp
- 80-column preview for the 64
- Turbo save and load
- Plus more than a dozen other *SpeedScript* support utilities all on one disk (including full documentation)

YES! Send me _____ copies of COMPUTE's *SpeedScript* Disk.

I've enclosed $11.95 plus $2.00 postage and handling. (Outside U.S. and Canada add $1.00 for surface mail or $3.00 for airmail.)

ORDER NOW!

_____ Amount
_____ Sales Tax*
_____ Total

Name _____

Address _____

City _____ State _____ ZIP _____

Mail personal check or money order to

Commodore *SpeedScript* Disk
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

Residents of North Carolina and New York, add appropriate tax for your area. Canadian orders, add 7% good and services tax

Please allow 4–6 weeks for delivery. Program available only on 5¼-inch disks

PROGRAMMER'S PAGE

Randy Thompson

TO FILL A CELL

Consider the character—a simple 8 × 8 cell. It's the basic building block of almost any 64 or 128 screen.

Being somewhat unoccupied, I, while pondering the graphical magnitude of the unassuming character, wrote the following 64 program. Believe it or not, this program generates every possible character that can be created in an 8 × 8 cell, and it does so without any human assistance.

Warning! The sun may burn out before this program comes to an end.

The inner workings of this program are really quite simple. Considering that a character is defined by the values stored in eight consecutive bytes, a character definition can be treated as one large 64-bit (eight-byte) number. So to generate every possible character, you simply start at $0000000000000000 and count up by 1. By the time you reach $FFFFFFFFFFFFFFFF, the 64 will have calculated and displayed every possible character.

With a program such as this, you don't need to be artistic. Whenever you want an impressive Gothic font or cool alien shape, just run this program and sit around until you see the image you like best. Let the computer do the work. Simple, right?

Wrong!

To be honest, this program is absolutely ludicrous. While $FFFFFFFFFFFFFFFF may look like a fairly manageable number in hexadecimal, consider its phenomenal base-ten representation. It equals 18,446,744,073,709,551,616. (I don't even know how to pronounce this number.) Don't try converting this number on your home calculator, folks. It won't work. In fact, I had to hand-calculate this number, so please forgive me if you discover any misplaced digits.

Silly as it is, I found my character-generating program to be quite intriguing. It makes one think: Shouldn't a computer be able to effortlessly compute and display every possible Commodore 64 character—a small graphic blob confined within a simple 8 × 8 grid? The fact is that it can't.

Computers are fast, but they're simply not up to the task of computing every possible character, no matter how small and insignificant a character cell might appear. First of all, the maximum speed at which the computer can switch between displaying one character and another is approximately 1/60 of a second. That's the scan rate of your TV and most computer monitors, unless you live in the U.K., where scan rates are only 50 frames per second. Even if your monitor could handle faster screen updates, your eyes couldn't. So due to both human and computer limitations, the best your 64 or 128 (or any other computer, for that matter) can hope to display is 60 different characters in a second.

So how long would it take? Since an eight-byte number is practically unfathomable, let's cut the size of the character in half for illustration purposes. For example, let's make the character half as tall (8 × 4) so that the character definition is only four bytes in size. (This much more than halves the number of possible characters since a four-byte number can hold a value only 1/4,294,967,296 as large as an eight-byte number.

A four-byte number can hold a value between $00000000 and $FFFFFFFF. This works out to be 4,294,967,296 different character patterns. At 60 characters per second, it would take over two years for the computer to finish displaying all possible 8 × 4 characters. That means that with an 8 × 8 character, it would take over two years before any pixels in the top half of the character would even begin to change.

If you understand binary numbering, it's easier to understand the order in which my program cycles through each character definition. Each pixel is being treated as a separate bit in an ever-increasing binary number. Observe the program in progress, and you'll see the pattern. The lowest byte affects the character's lowest line of pixels while the least significant bit of each byte affects the character's rightmost pixels. As a result, pixels are twiddled (for lack of a better word) in right-to-left, bottom-to-top order.

While the program runs, see if you can locate the pixel situated in the character's third row, second column. Gloomy as it may sound, you will die before this pixel comes to life. See the first pixel sitting on the top line? The sun will burn out about the time this sucker lights up. Mind-boggling, isn't it?

So what's the final result? To complete the entire set of 8 × 8 characters, it would take 9,749,040,289 years. In words, that's nine billion, seven hundred forty-nine million, forty thousand, two hundred eighty-nine years. That's give or take 90 days or so.

Now, consider the sprite . . . !

```
EB 100 POKE 53280,0:POKE 53281
       ,0:PRINT "{CLR}"
BR 110 FOR I=12288 TO 12295:PO
       KE I,0:POKE I+40,0:NEXT
KG 120 FOR I=828 TO 854:READ D
       :POKE I,D:C=C+D:NEXT
DX 130 IF C<>3100 THEN PRINT "
       ERROR IN DATA STATEMENT
       S":END
CD 140 POKE 53272,(PEEK(53272)
        AND 240) OR 12:POKE 15
       23,0:POKE 55795,13:SYS
       {SPACE}828
BE 150 DATA 162,7,173,17,208,4
       8,251,173
BH 160 DATA 17,208,16,251,189,
       0,48,824
RX 170 DATA 105,1,157,0,048,20
       8,233,202
DE 180 DATA 16,242,96
```

DEMON

By Vaughan Bardell

Just as you were ready to pull your hair out in frustration, here is the ultimate in disk monitors to ease the pain. If ever there was a tool for delving into files, this is it.

DeMON is an enhanced disk monitor for the 64 that fills the gap between a memory resident and a cartridge-based monitor. It enables the user to view and edit files on disk using powerful commands, without directly loading the file into memory.

The main advantage of a disk monitor is its ability to view a large file on disk without the need to load it into memory. This overcomes the problem encountered when the file takes up most of the memory, leaving little, if any, for the monitor.

To get the most out of DeMON, an understanding of Commodore 64 assembly language and experience with machine language monitors is necessary. Novices can use it to view text in a file, among other features.

Typing in DeMON

DeMON is a large program written entirely in machine language. To enter it, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following.

Starting address: 8000
Ending address: 9967

When you've finished typing, save several copies to disk before leaving MLX.

Using DeMON

Load DeMON with ,8,1 and then press the Restore key. The screen will turn dark blue, and a startup message will appear. After exiting DeMON the Restore key can be used to restart the program as long as it hasn't been overwritten by another program.

Restore also returns you to the command entry mode. This can be used in the event of a crash or to stop the Load or Hunt operations. Many of the commands are exited simply by using the Run/Stop key.

Use the space bar to pause listings. Press it again to let the listing continue. On some commands other features can be accessed while the listing is paused.

All addresses in DeMON are hexadecimal. No dollar sign is required before hex values. If one is included, an error will result. Track and sector numbers, however, are in decimal and are expected to be entered in decimal. The ending address of a file using DeMON is the last byte of a file, not the ending address plus 1 as is common with many monitors. This is important since some commands list the ending address of a file.

If you call a file that isn't on the current disk, you'll get an error message. Insert the correct disk and press Return again to continue.

The Commands

When DeMON is in command entry mode, you'll see a line prompt (>) and a flashing cursor. The commands are represented by a one- or two-letter abbreviation, followed by appropriate parameters. Below is a description followed by a summary of all the 13 main DeMON commands.

Load (L). To set up a file for use with DeMON, you must first load it. The load command constructs a table of the link track and sectors in memory. A file in the directory can be loaded, or the starting track and sector of a file can be entered. DeMON will load the file starting at that track and sector. Please note that if the latter option is used, then the first two bytes of the sector are expected to be the link track and sector, and the next two, the starting address of the file.

To load a file, type *L* with the filename in quotes (*L*"filename"). As with a normal load from the disk drive, all forms of pattern matching are acceptable. The ,8 isn't required.

To load a file using the starting track and sector, type the load command followed by a comma, the track, another comma, and then the sector. For example, L,19,5 will load a file starting at track 19, sector 5.

After loading, the file's starting and ending addresses will be displayed.

Find address (FA). This command is very handy for finding the position of a specified address from the current file on the disk. The command will list the track, sector, and position in the sector of an address in the file. The command is followed with an address that is between the starting and ending addresses of the current file, inclusive—for example, FA 6F01.

Relocate (RL). If the load address of the current file needs to be changed, use the relocate command. Follow the command with the new starting address. This command also clears the current offset. More about that later.

Offset (OF). The offset command is similar to relocate but allows more flexibility with the changing of addresses. It allows an offset to be set which is added to the addresses in the file. This is particularly helpful when the file moves part of itself once in memory. After using offset, any JMPs or JSRs to the transferred portion can be viewed.

The offset command is followed by the new address, an equal sign, and then the old address. The new address now equals the old address—for example, OF 2000=0900.

The command is like a soft relocate since the offset can be cleared by entering *OF* without the addresses.

List address (LA). The list address command is used for listing the starting and ending addresses of the current file. It can also calculate new starting and ending addresses from an input starting or ending address for the file. It doesn't change addresses.

Type the command without parameters to list the starting and ending addresses of the current file. If an address is included after the command, then the ending address of the current file, if it were to be loaded at this address, would be calculated and printed along with the starting address.

If a comma precedes the input address, then this address will be interpreted as the ending address. The starting address, if the file ends at this address, will be calculated and printed.

Exit DeMON (X). Use this command to exit DeMON back to BASIC. A BASIC program can be typed in without fear of its overwriting DeMON since the end of the BASIC storage area is moved

down in memory. Be sure to type *NEW* before entering a BASIC program.

Disassemble (D). Disassemble is one of the major commands and is the crux of DeMON. It is different from most monitors but has features that allow flexible disassembly of machine language programs.

Two modes are accessible in disassemble. These are interrupted and continuous modes. In continuous mode, the file is listed on the screen, like listing a BASIC program. The screen scrolls up as more data is printed. Press the space bar to halt the listing.

In interrupted mode, the file listing is printed page by page. At the end of each page DeMON waits for keyboard input from the user. The space bar will continue disassemble with the next page. Other keys can be pressed at this stage to access other advanced features.

One advantage of interrupted mode is that at the end of the file, the message *THE END* will be printed. Other features can then be used to jump elsewhere in the file instead of ending disassemble by pressing the space bar. More features will be detailed later.

The disassemble mode can be toggled while the listing is paused, either in interrupted or continuous mode, by pressing f8.

If only *D* is entered, disassemble commences at the beginning of the file. If an address follows the command, then disassemble starts at that address. Modes can be preset by including the suffix ,C for continuous mode or ,I for interrupted mode. When started, DeMON is in interrupted mode.

The screen display in disassemble consists of the memory address, the assembly language code (followed by the bytes of that command), the ASCII, and then the screen code representations of these bytes. The screen codes are the characters that would appear if these bytes were placed directly into screen memory.

To exit disassemble, press Run/Stop. This returns you to command entry mode. Before examining the other features available with disassemble, let's take a look at the rest of DeMON's primary commands.

Interrogate (I). Interrogate is used to view simultaneously the hex bytes in the file and their ASCII/screen code representations. The display scrolls upward as data is printed. On the far left is the address of the first byte on that line. Eight hex bytes follow and then their representations are shown. These are preceded by an apostrophe. Place ,S after the address to view screen codes; omit the suffix for normal ASCII display. During viewing, the mode can be toggled by using the f3 key once the listing is paused.

The f4 key toggles between interrogate and disassemble. It can be used with text list, interrogate, or disassemble in interrupted or continuous mode while the listing is paused. Like the disassemble command, the interrogate command can be used with the default address function if no address is entered—for example, I; I 5000; I 5000,S; or I,S.

Text list (TL). This command rapidly scans a file for any text or messages. It will simultaneously print the ASCII and screen code of the bytes in the file in two columns, with ASCII on the left and screen codes on the right. A black hyphen separates the two columns. To use the command, either enter an address after the command or leave it blank for the default starting address.

To toggle between text list and interrogate, press f1 while the listing is paused. Run/Stop will exit the text list.

Change (C). Use this command to alter bytes in a file. It allows character strings, byte strings, and assembly code to be entered anywhere in a file. The entry must, however, fit in the file. It cannot extend beyond the end of the file.

The entry is performed line by line. A period (.) at the start of the line indicates that DeMON expects the next change-line entry. At the beginning of a line is the address at which the bytes in that line will be stored. This address can be anywhere in the file, and entries don't have to be in ascending address order.

After the address comes the actual data that is to be stored in the file. Only one type of entry can be on any single line. The first character distinguishes what type of entry it is: assembly, string, byte, or no entry.

To enter assembly language, no such character is required. Just simply type in a valid assembly statement, making sure any branches are in range, and press Return. When entering LSR, ASL, ROL or ROR commands that use the accumulator addressing mode, no *A* needs to follow the command. All hex numbers must be preceded by a dollar sign when typing in an assembly line. No other number base can be used to enter numbers. No spaces between the command and the addressing mode code are needed.

Here are some examples.

```
.5000 LDA$7000,X
.1209 BNE$1250
.31FF LDY#$91
.49F0 "Mary had a little lamb."
```

To enter a character string on a line, enclose the string in double quotes. Spaces inside quotes will be recognized.

A byte string may be entered by preceding the 8-bit hex numbers with a colon. Spaces between the bytes are not necessary, but they make the entry easier to read.

```
.F000 :01 FF 41 20 50 49 47
```

To finish the entry, press Return on a blank line. DeMON will then ask you to confirm that you want the changes sent to disk. If you do, press Y and Return. If not, press N or just Return. When you press Return at the end of a data entry line, DeMON checks the line, enters it into memory, and then prints the address that follows the last byte in the previous line. You can edit this address if you like.

DeMON stores the entered changes in RAM under BASIC ROM at $A000. It doesn't limit the number of bytes to change, but it does limit the number of lines to be changed at one time to 255.

Hunt (H). This command enables you to search the file for a character or byte string. Follow the hunt command with a character string enclosed in double quotes or a byte string. Follow this with the optional parameters for setting the search block. To hunt from a spe-

cific address to the end of a file, include a comma and the address after the string. To hunt from the beginning of a file to a certain address, include two commas and the address after the string. Finally, to hunt between two addresses in a file, follow the string with a comma, the hunt starting address, another comma, and the hunt ending address. At the end of the hunt, DeMON will output all the addresses at which the string was found.

The hunt command is reasonably fast, hunting through a 200-block file in less than 25 seconds. DeMON will stop after it locates the first 127 finds. If this happens, *BUFFER FULL* will appear on the screen. To search the rest of the file, simply specify the last address found as the starting address for the next hunt.

Here are some examples.

H "food"
H 01 02 03 20
H "great",2300 (Search from $2300 to end of file.)
H FF D0 00,,1000 (Search from start of file to $1000.)
H "ball",2000,4000 (Search between $2000 and $4000.)

Directory ($). Entering this character and pressing Return loads the directory of the disk in the drive. The listing can be paused, as with other listings, by pressing the space bar. Run/Stop exits the listing.

Pattern matching is supported with the directory listing so only files matching the pattern entered will be displayed. Follow the dollar sign with a colon and the pattern, such as $:FAD*.

Disk drive status (@). This command allows you to read the disk drive error channel for an error that may have occurred.

Disk command (@). To send a disk command, precede it with the at symbol (@). No quotes are needed—for example, @ R:RAISIN=SULTANA.

Command Summary

Here is a summary of DeMon's 13 main commands.

Load (L). Load a file.

Find address (FA). List track, sector, and position of an address in a file.

Relocate (RL). Set new starting address for a file.

Offset (OF). Set an offset which is added to absolute addresses output.

List address (LA). List starting and ending addresses of a file.

Exit (X). Exit DeMON.

Disassemble (D). Disassemble code from a file.

Interrogate (I). Examine bytes in a file.

Text list (TL). List text found in a file.

Change (C) Change data in a file.

Hunt (H). Hunt through a file for a specified character or byte string.

Directory ($). Display disk directory.

Drive status or disk command (@).

Other Disassemble Features

When the disassemble display is paused in the interrupted mode, f5 and f1 can be used to access two advanced commands that expand the versatility of DeMON. Jump investigation enables a JSR or JMP command or any manually entered address to be investigated.

When f5 is pressed, DeMON checks to see if there are any jumps on the screen that are in range of the file. If so, DeMON highlights the first of these valid jumps on the screen. The cursor up/down key can be used to move the highlight line onto another jump. To jump to the highlighted jump, press the space bar.

If there are no jumps, or none in range on the screen, then DeMON replaces the top line of the screen with an address entry line where an address can be entered manually. If the address entered is not in range, then DeMON will continue disassemble on the following page.

If there are any valid jumps on the screen, subsequent presses of f5 will toggle between manual entry and jump selection. If you press Run/Stop to exit jump investigation mode, DeMON will continue with the next page of disassemble.

When investigating a jump, other jumps can be accessed by the same method. To return to where the jump originated, press the Return key. With nested jumps, each press of the Return key will return you to the previous jump command until the first jump is reached.

To clear the return addresses for jumps that have taken place, press f6. The screen will flash yellow, indicating that the table has been cleared. This command will also clear the Backward-Jump table. (See below.)

Pressing Shift/Return returns you to either the start of disassemble, the last place where f6 was pressed, or where the disassemble mode was changed from continuous to interrupted mode.

Back Screen. When in the interrupted mode, disassemble can either proceed or move backward. Press f1 to move backward at the end of the page, and DeMON will display the previous page. The listing will stop at the beginning of disassemble, at the point where the disassemble mode was changed from continuous to interrupted, at the beginning of a jump investigation section, or at the point where f6 was pressed.

Back Screen allows easy access to previous screens, enabling the user to go back and check the disassembly after looking forward in the file.

Special Key Summary

Here is a summary of DeMon's various key commands.

f1. In disassemble, used to jump back in the listing. In interrogate or text list, f1 toggles between these two displays.

f3. In interrogate, used to toggle between ASCII and screen code representation of data.

f4. In disassemble, text list, or interrogate, used to toggle between interrogate and disassemble display.

f5. In interrupted mode disassemble,

used to enter a jump investigation address (manually or automatically) and look at the code referred to by a JMP, JSR, or any other code in the file.

f6. In interrupted mode disassemble, used to clear the current Back Screen table and the Jump Investigation table, making the current screen the first screen. This is as if disassemble started at this address. Using f1 displays back screens only up to this screen.

f8. In disassemble this is used to toggle the current disassemble mode between interrupted and continuous.

Space. Used to pause listings to the screen. In the jump investigation, automatic-jump selection, it is used to jump to a JSR or JMP. In interrupted disassemble mode, it will display the next screen of the listing.

Return. Used to return from a jump investigation to the previous address.

Shift/Return. Returns to the first address in the Jump Investigation table when disassemble is in the interrupted mode.

Run/Stop. Exits most commands and functions.

Restore. When in DeMON, this will return you to command entry mode. It is particularly handy when you're hunting or loading if you need to exit partway through. Exiting from a load, however, will leave the File table and variables corrupted. Use the load command to load another file.

Mastering DeMON

As you continue to use DeMON, you will get better at using the commands and viewing and changing files, and you will be able to get the most out of it and realize its true potential. However, this may take a while, but practice makes perfect! Many happy hours of hunting through files.

DEMON

```
8000:F2 FC 09 80 C3 C2 CD 38 DF
8008:30 A9 06 8D 20 D0 8D 21 A5
8010:D0 A2 18 86 D6 20 D7 AA 1F
8018:CA 10 FA A9 D5 8D 18 03 94
8020:A9 80 8D 19 03 A9 80 85 9E
8028:38 E8 86 37 AD D4 96 D0 82
8030:05 EE D4 96 86 96 E8 8E 62
8038:86 02 20 44 E5 A9 44 A0 44
8040:99 20 1E AB 20 D7 AA 20 6A
8048:43 82 A0 00 84 3C 20 CF C4
8050:FF C9 0D F0 0D C9 3E F0 71
8058:F5 C9 20 F0 07 A2 80 86 24
8060:3C FC A9 00 99 00 02 AA 6F
8068:F0 03 C8 D0 E1 98 F0 D4 F0
8070:24 3C 10 D0 A9 FF 85 7A 74
8078:A9 01 85 7B 84 11 20 C2 62
8080:80 A0 00 D9 9F 96 F0 0A CA
8088:C8 C8 BE 9F 96 D0 F4 4C 20
8090:F8 80 48 20 C2 80 C8 BE A1
8098:9F 96 D0 06 20 B9 80 4C BE
80A0:AE 80 D9 9F 96 F0 07 20 F4
80A8:B9 80 68 4C 89 80 68 88 20
80B0:B9 BB 96 48 B9 BA 96 48 03
80B8:60 A5 7A D0 02 C6 7B C6 98
80C0:7A 60 20 73 00 C9 00 60 D9
80C8:84 FB A0 01 B1 7A 08 A4 5B
80D0:FB E6 7A 28 60 20 42 F6 5A
80D8:20 E7 FF A2 FF 9A E8 86 D0
80E0:C6 86 3B 8E 33 99 F0 86 9F
80E8:20 D7 AA A9 47 8D 18 03 83
80F0:A9 FE 8D 19 03 4C 74 A4 A0
80F8:20 45 AB 4C D5 80 68 85 9C
8100:62 68 85 63 84 64 86 65 5D
8108:A0 00 20 37 81 08 29 7F D0
8110:C9 01 F0 11 20 D2 FF 28 DB
8118:10 EE A5 63 48 A5 62 48 AF
8120:A6 65 A4 64 60 20 37 81 1E
8128:AA 20 37 81 20 D2 FF CA 9E
8130:D0 FA 28 10 D3 30 E3 E6 6E
8138:62 D0 02 E6 63 B1 62 60 56
8140:20 57 81 20 D7 AA 20 C2 C7
8148:80 F0 2A C9 2C F0 7E 20 EB
8150:FE 82 90 77 4C F8 80 A5 E9
8158:96 D0 C9 20 FE 80 0D 20 4A
8160:02 3F 20 4E 4F 20 46 49 ED
8168:4C 45 20 4C 4F 41 44 45 F8
8170:44 8D 4C D5 80 A5 BE 05 FC
8178:BF F0 05 A9 FC 8D A3 81 B9
8180:A5 B0 18 65 9E 48 A5 B1 EE
8188:65 9F 48 20 3A 82 A6 B1 0C
8190:A5 B0 20 9A 82 A9 2D 20 75
8198:D2 FF 20 3A 82 68 AA 68 20
81A0:20 9A 82 4C D5 80 20 FE 5F
81A8:80 20 4F 46 46 53 45 54 A0
81B0:3A A4 20 6A 86 AA A5 C3 92
81B8:18 65 9E 48 A5 C4 65 9F 24
81C0:48 A9 4C 8D A3 81 A5 C3 E6
81C8:4C 92 81 90 17 20 D8 82 3D
81D0:48 20 3A 82 68 48 38 E5 2A
81D8:9E A8 A5 FD 48 E5 9F AA AD
81E0:98 4C 92 81 C6 7A 20 D8 E6
81E8:82 48 20 3A 82 68 85 C4 6C
81F0:18 65 9E 48 A5 FD 65 9F 41
81F8:48 A6 FD A5 C4 4C 92 81 E1
8200:20 57 81 20 D8 82 AA 20 63
8208:D7 AA A4 FD 20 4A 86 86 D5
8210:FA 85 F8 98 AA 20 A8 85 49
8218:20 46 82 A6 FA 20 A8 85 A8
8220:20 46 82 20 3A 82 A5 F8 39
8228:20 A0 82 4C D5 80 20 D8 44
8230:82 85 B0 A5 FD 85 B1 4C FD
8238:62 82 A9 24 FC A9 23 FC 58
8240:A9 2C FC A9 3E FC A9 2F C7
8248:FC A9 93 FC A9 20 4C D2 B1
8250:FF 20 C2 80 48 20 B9 80 74
8258:68 60 20 57 81 20 51 82 D4
8260:D0 0C 20 67 82 F0 30 A9 2D
8268:00 85 BE 85 BF 60 20 D8 97
8270:82 85 C1 A5 FD 85 C2 20 56
8278:C2 80 C9 3D F0 03 4C F8 31
8280:80 20 D8 82 85 C3 A5 FD 95
8288:85 C4 38 A5 C1 E5 C3 85 95
8290:BE A5 C2 E5 C4 85 BF 4C 1D
8298:D5 80 48 8A 20 A0 82 68 4B
82A0:48 20 AE 82 20 D2 FF 68 84
82A8:20 BE 82 4C D2 FF 29 F0 5C
82B0:4A 4A 4A 4A 18 69 30 C9 EB
82B8:3A 90 02 69 06 60 29 0F E8
82C0:4C B4 82 48 20 AE 82 85 34
82C8:FD 68 4C BE 82 20 A6 AD EB
82D0:20 F7 B7 A6 14 A4 15 60 03
82D8:20 DD 82 85 FD 20 EC 82 DA
82E0:0A 0A 0A 0A 85 FE 20 EC A4
82E8:82 05 FE 60 20 C2 80 20 83
82F0:FE 82 B0 1E 38 E9 30 C9 A1
82F8:0A 90 02 E9 07 60 C9 30 83
8300:90 0E C9 3A 90 08 C9 41 29
8308:90 06 C9 47 B0 02 18 60 A4
8310:38 60 4C F8 80 20 67 82 3A
8318:85 B3 85 F7 85 3B 85 A6 C9
8320:8D 3A 99 A8 20 C2 80 C9 11
8328:2C D0 19 20 51 82 F0 14 29
8330:20 6C 90 A5 AA 8D 35 99 5E
8338:48 A5 AB 48 8D 36 99 A0 DF
8340:00 A2 00 FC A2 0A 8E 33 4D
8348:99 F0 15 C9 22 D0 C3 20 93
8350:C8 80 C9 22 F0 08 99 40 52
8358:01 C8 C0 10 90 F1 84 FB 7C
8360:A9 9A 85 A7 20 AD 85 20 F0
8368:63 85 20 CF FF 85 C1 20 3D
8370:CF FF 85 C2 20 CC FF AD 1E
8378:33 99 F0 33 A5 FB A2 40 73
8380:A0 01 20 BD FF A9 03 A0 45
8388:00 20 00 B6 A2 03 20 C6 28
8390:FF 20 CF FF 85 C3 20 CF E4
8398:FF 85 C4 20 CC FF A9 03 58
83A0:20 C3 FF A5 90 4A 4A 90 D5
83A8:17 20 CC FF 4C 11 86 68 F8
83B0:85 AB 68 85 AA A9 02 20 EA
83B8:B7 85 20 63 85 4C 91 83 3B
83C0:A5 C1 85 03 A5 C2 85 04 33
83C8:A5 C3 85 B0 A5 C4 85 B1 4C
83D0:A0 49 20 2F F1 E6 96 A9 73
83D8:06 8D 34 99 A2 D9 A0 84 A8
83E0:20 7E 84 20 6C 84 A0 00 E0
83E8:88 D0 FD 2C 00 DD 50 FB FE
83F0:A9 04 8D 3B 99 A9 80 8D 35
83F8:3C 99 20 73 84 20 60 85 AA
8400:A0 00 20 CF FF 91 A6 C8 B6
8408:C0 80 D0 F6 98 18 65 A6 B1
8410:85 A6 90 02 E6 A7 20 5C 2A
8418:84 A5 A7 C9 9C D0 DB A9 E7
8420:03 8D 3C 99 A9 B7 8D 3A B0
8428:99 A9 00 8D 3B 99 20 73 35
8430:84 20 60 85 20 CF FF 85 AD
8438:9E 20 CF FF 85 9F 20 CF 4D
8440:FF 85 9C 20 CC FF A5 9E 90
8448:05 9F F0 06 20 D7 AA 4C 3C
8450:75 81 A9 00 85 96 20 45 B5
8458:AB 4C 11 86 98 18 6D 3A 0F
8460:99 8D 3A 99 90 03 EE 3B 24
8468:99 4C CC FF 20 68 85 A2 3B
8470:00 F0 05 20 68 85 A2 07 FD
8478:20 CC 84 4C CC FF 85 C4 50
```

```
8480:86 C1 84 C2 A0 00 B1 C1 24
8488:E6 C1 85 3C 98 85 C3 20 6C
8490:68 85 A5 C3 A4 C4 8D 41 B4
8498:99 8C 42 99 A2 0E 20 C9 CA
84A0:84 A0 00 B1 C1 20 A8 FF 0F
84A8:C8 C0 20 D0 F6 20 CC FF 29
84B0:A5 C1 18 69 20 85 C1 90 C1
84B8:02 E6 C2 A5 C3 18 69 20 A0
84C0:90 02 E6 C4 C6 3C 10 C5 C8
84C8:60 A0 05 FC A0 06 BD 30 63
84D0:99 20 D2 FF E8 88 10 F6 89
84D8:60 05 AD 05 02 85 18 AD 5D
84E0:06 02 85 19 20 00 C1 20 54
84E8:B7 E9 A9 00 85 B5 85 B7 43
84F0:85 B8 85 B9 A9 04 85 B6 56
84F8:A5 18 8D 00 04 A4 19 8C FD
8500:01 04 A2 FC 85 06 84 07 05
8508:A9 80 85 00 A5 00 30 FC 43
8510:C9 01 D0 43 A0 02 AD 00 F6
8518:03 48 08 20 6A 06 AD 01 81
8520:03 20 6A 06 A8 E6 B9 28 DE
8528:F0 09 8A 20 73 06 68 A2 68
8530:FE D0 D1 68 A6 B9 CA D0 32
8538:02 88 88 88 88 98 20 73 5A
8540:06 4C 83 06 91 B5 E6 B5 19
8548:D0 02 E6 B6 60 18 65 B7 6A
8550:85 B7 90 02 E6 B8 60 A9 C2
8558:00 85 B7 85 B8 4C AE E9 52
8560:A2 0F FC A2 02 4C C6 FF 19
8568:A2 0F FC A2 02 4C C9 FF 27
8570:A9 31 FC A9 32 8D 7F 85 23
8578:20 68 85 20 FE 80 55 31 36
8580:3A 32 2C 30 AC A6 AA 20 33
8588:A8 85 A9 2C 20 D2 FF A6 34
8590:AB 20 A8 85 4C CC FF 20 9C
8598:68 85 20 FE 80 42 2D 50 E4
85A0:3A 32 AC A6 9B 4C 91 85 0C
85A8:A9 00 4C CD BD A9 12 85 2D
85B0:AA A9 00 85 AB A9 A2 85 A2
85B8:9B 20 C8 85 20 F8 85 20 1B
85C0:70 85 20 97 85 4C 26 86 13
85C8:A9 01 A2 3A A0 A0 20 BD 66
85D0:FF A9 02 4C FF 85 20 51 F2
85D8:82 F0 30 20 F8 85 20 68 EF
85E0:85 20 C8 80 F0 06 20 D2 8A
85E8:FF 4C E1 85 20 D7 AA 20 71
85F0:CC FF 4C 0B 86 4C D5 80 2E
85F8:A9 00 20 BD FF A9 0F A8 26
8600:20 06 86 4C C0 FF A2 08 87
8608:4C BA FF 20 CC FF 20 F8 8B
8610:85 20 D7 AA 20 60 85 20 3B
8618:CF FF 20 D2 FF C9 0D F0 70
8620:03 AA D0 F3 F0 41 A5 90 1B
8628:29 6F D0 DF 60 86 C1 84 E2
8630:C2 20 6A 86 38 A5 C1 E5 1E
8638:C3 85 C3 A5 C2 E5 C4 85 18
8640:C4 A5 9E C5 C3 A5 9F E5 23
8648:C4 60 20 2D 86 B0 29 F0 E0
8650:27 20 FE 80 0D 3F 20 49 CF
8658:4E 56 41 4C 49 44 20 41 EB
8660:44 44 52 45 53 53 8D 4C 8E
8668:D5 80 A5 B0 18 65 BE 85 99
8670:C3 A5 B1 65 BF 85 C4 60 53
8678:A9 FC 8D A6 86 A9 9C 85 4F
8680:A9 A2 00 A5 C3 C9 FC B0 55
8688:18 A5 C4 D0 14 AE 01 9A A8
8690:A9 9A 85 A7 A9 00 85 F7 94
8698:A5 C3 18 69 04 AC 00 9A 70
86A0:60 E8 A5 C3 38 E9 FC A0 0D
86A8:FE 8C A6 86 85 C3 B0 02 34
86B0:C6 C4 A5 C4 D0 EB A5 C3 98
86B8:C9 FE B0 E5 8A C5 9C 90 14
86C0:02 D0 8E 0A AA A0 9A 90 13
86C8:01 C8 84 C2 8A 85 C1 85 B8
86D0:F7 A5 C2 85 A7 A0 01 B1 67
86D8:C1 AA 88 B1 C1 A8 A5 C3 5D
86E0:18 69 02 60 20 4A 86 86 58
86E8:AB 84 AA 85 9B 60 A9 01 4D
86F0:A0 60 20 06 86 A2 00 A0 2A
86F8:02 A5 11 20 BD FF 20 D5 98
8700:F3 A5 BA 20 49 87 20 13 87
8708:EE A6 90 F0 03 4C 0B 86 3F
8710:20 13 EE 20 D7 AA 20 13 90
8718:EE 20 13 EE F0 25 20 13 67
8720:EE AA 20 13 EE 20 CD BD D7
8728:20 4C 82 20 13 EE F0 E3 C6
8730:20 D2 FF 20 EA 88 F0 0B 6C
8738:90 F1 20 EA 88 B0 EC F0 90
8740:02 90 F7 20 EF ED 4C D5 1B
8748:80 20 09 ED A5 B9 4C C7 14
8750:ED 8A 38 E5 B0 AA 98 E5 A5
8758:B1 A8 60 A5 C1 38 E5 C3 4F
8760:85 3C A5 C2 E5 C4 05 3C AA
8768:60 20 6C 87 A0 00 C6 B4 FC
8770:38 F1 B4 B0 02 C6 40 60 C5
8778:A5 D6 A2 FF C9 16 90 DA 07
8780:20 FE 80 0D 01 0D 20 12 CE
8788:20 50 52 45 53 53 20 53 D5
8790:50 41 43 45 A0 A9 00 85 06
8798:C7 A4 B4 38 A5 3F E5 3D 02
87A0:99 00 9D E6 B4 20 03 89 54
87A8:C5 C6 F0 FC 20 E4 FF 85 54
87B0:B2 C9 85 D0 72 A5 B4 C9 A6
87B8:02 90 EA A5 3F 48 A5 40 4B
87C0:48 A0 00 A5 3F 20 69 87 4B
87C8:85 3F A4 3B F0 30 B9 00 6E
87D0:9F AA B9 01 9F A8 20 51 D2
87D8:87 84 C2 86 C1 A6 3F A4 59
87E0:40 20 51 87 EA EA 84 C4 8B
87E8:86 C3 20 5B 87 F0 0F 90 94
87F0:0D 68 85 40 68 85 3F E6 14
87F8:B4 E6 B4 4C A5 87 68 68 FB
8800:A4 40 A6 3F 20 4A 86 85 F8
8808:9B 85 A8 A9 00 85 FE E4 F0
8810:AB D0 04 C4 AA F0 0A 86 AB
8818:AB 84 AA 20 70 85 20 DF 31
8820:8F 20 97 85 4C E5 88 C9 21
8828:87 D0 06 20 73 94 4C E5 60
8830:88 C9 8D D0 16 A0 00 84 6E
8838:3B 84 B4 AE 00 9F 86 3F 54
8840:AC 01 9F 84 40 20 B7 95 AB
8848:4C E5 88 C9 0D D0 32 A5 5C
8850:3B F0 A8 A5 3F 20 6C 87 85
8858:85 3F A4 3B B9 00 9F C5 17
8860:3F D0 EC B9 01 9F C5 40 D0
8868:D0 E5 C6 B4 C6 3B C6 3B 6B
8870:A4 3B B9 00 9E 85 3F AA 0E
8878:B9 01 9E 85 40 A8 4C 45 55
8880:88 C9 8C D0 14 A9 01 85 B5
8888:B3 A9 91 20 D2 FF 20 D2 BB
8890:FF 20 FD 88 A2 00 4C D7 77
8898:AA C9 8A D0 05 A2 01 4C D0
88A0:77 96 C9 8B D0 34 A9 00 AF
88A8:85 3B A5 3F A6 40 38 E5 80
88B0:3D B0 01 CA A5 3D 8D 00 96
88B8:9F 8E 01 9F A4 B4 88 B9 1A
88C0:00 9D 8D 00 9D A9 01 85 06
88C8:B4 EE 20 D0 A5 A2 69 18 A3
88D0:C5 A2 D0 FC CE 20 D0 4C 3C
88D8:A5 87 C9 03 D0 03 4C D5 09
88E0:80 C9 20 D0 F2 A2 01 A4 7E
88E8:B2 60 20 03 89 A5 C5 C9 D7
88F0:3C D0 06 C5 C5 F0 FC 38 95
88F8:60 C9 3F 18 60 A5 C5 C9 05
8900:40 D0 FA A9 00 85 C6 60 65
8908:A9 90 FC A9 08 85 12 20 E8
8910:57 81 20 2B 90 20 51 82 10
8918:F0 04 C9 2C D0 09 20 6A F5
8920:86 A8 A5 C3 4C 2C 89 20 D7
8928:D8 82 A4 FD 85 3F AA 84 BF
8930:40 20 E4 86 24 12 30 1A 54
8938:20 C2 80 F0 0E C9 2C D0 EB
8940:07 20 C2 80 C9 53 F0 06 C2
8948:4C F8 80 A9 00 FC A9 01 B2
8950:85 F8 20 5C 8A 20 D7 AA 5D
8958:20 63 85 A6 40 A5 3F 20 A6
8960:9A 82 24 12 10 07 20 4C 30
8968:82 A0 10 D0 09 A0 08 24 F2
8970:12 30 03 20 4C 82 20 CF 77
8978:FF 99 3C 03 24 12 30 03 76
8980:20 A0 82 88 08 E6 9B F0 A8
8988:64 28 D0 E3 24 12 10 22 DB
8990:A0 10 B9 3C 03 20 65 8A E0
8998:88 D0 F7 A9 90 20 D2 FF 68
89A0:20 FE 80 2D 85 A0 10 B9 EE
89A8:3C 03 20 4E 8A 88 D0 F7 93
89B0:F0 1A A9 27 20 D2 FF A0 57
89B8:08 B9 3C 03 A6 F8 F0 06 F6
89C0:20 4E 8A 4C C9 89 20 65 A7
89C8:8A 88 D0 ED 20 EA 88 F0 EA
89D0:5D 90 46 20 EA 88 F0 56 33
89D8:B0 3F AE 77 02 E0 86 D0 D2
89E0:0E 24 12 30 0A A5 F8 49 6B
89E8:01 85 F8 10 2C F0 42 E0 88
89F0:8A D0 17 A2 00 86 3B A5 C0
89F8:3F 8D 00 9F A5 40 8D 01 53
8A00:9F 20 D7 AA 20 D7 AA 4C 94
8A08:2F 8D E0 85 D0 C5 A5 12 87
8A10:30 03 A9 90 FC A9 08 85 60
8A18:12 18 A5 12 29 1F 65 3F E1
8A20:85 3F 90 02 E6 40 20 DA 4D
8A28:8C B0 03 4C 55 89 4C D5 14
8A30:80 98 48 A4 F7 B1 A6 85 58
8A38:AA C8 B1 A6 85 AB C8 A9 8B
8A40:02 85 9B 20 5C 8A 20 63 DD
8A48:85 68 A8 4C 89 89 AA 98 74
8A50:48 A4 D3 8A 91 D1 C8 84 BF
8A58:D3 68 A8 60 20 B9 85 20 9F
8A60:0F 90 84 F7 60 C9 20 90 2C
8A68:0C C9 22 F0 08 C9 80 90 42
8A70:06 C9 A0 B0 02 A9 2E 4C 79
8A78:D2 FF 20 57 81 20 2B 90 E3
8A80:20 51 82 A0 00 C9 22 F0 B0
8A88:1E 20 FE 82 90 03 4C F8 DE
8A90:80 20 DD 82 99 3C 03 C8 5E
8A98:C0 14 B0 F2 20 51 82 F0 94
8AA0:19 C9 2C D0 EC F0 13 E6 7F
8AA8:7A 20 C8 80 C9 22 F0 0A E6
8AB0:99 3C 03 C8 C0 14 90 F1 F7
8AB8:B0 D4 8C 3B 03 98 18 69 B4
8AC0:08 85 F9 20 C2 80 C9 2C 54
8AC8:D0 31 20 51 82 C9 2C D0 10
8AD0:0E 20 6A 86 85 FA A5 C3 D1
8AD8:85 3C 20 C2 80 D0 10 20 77
8AE0:D8 82 85 3C A5 FD 85 FA A2
8AE8:20 C2 80 C9 2C D0 15 20 5A
8AF0:D8 82 85 FF A5 FD 85 FC F0
8AF8:4C 14 8B 20 6A 86 85 FA 20
8B00:A5 C3 85 3C 20 6A 86 A5 AC
8B08:C3 18 65 9E 85 FF A5 C4 D9
```

```
8B10:65 9F 85 FC A6 3C 8E 37 BC
8B18:03 A4 FA 8C 38 03 20 4A 5A
8B20:86 8C 34 03 8E 35 03 38 DB
8B28:E9 02 8D 36 03 A6 FF A4 21
8B30:FC 8E 39 03 8C 3A 03 20 34
8B38:4A 86 A9 03 8D 34 99 A2 8E
8B40:D8 A0 8B 20 7E 84 20 68 0E
8B48:85 A0 04 A2 00 20 CE 84 97
8B50:A4 F9 A2 00 BD 34 03 20 71
8B58:D2 FF E8 88 D0 F6 20 CC ED
8B60:FF C8 D0 FD 2C 00 DD 70 31
8B68:FB 20 D7 AA A9 05 A0 02 CF
8B70:A2 00 8D 3B 99 8C 3C 99 4F
8B78:8E 3A 99 20 73 84 20 C6 4F
8B80:8B A4 C3 F0 3E 84 FB C0 CA
8B88:FF D0 01 C8 98 38 E9 02 FB
8B90:85 C1 F0 16 20 73 84 20 52
8B98:C6 8B A6 C4 A5 C3 20 9A 2E
8BA0:82 20 4C 82 C6 C1 C6 C1 3F
8BA8:D0 EA E6 FB D0 12 20 FE 8D
8BB0:80 0D 0D 42 55 46 46 45 A6
8BB8:52 20 46 55 4C 4C 21 8D 82
8BC0:4C D5 80 4C F8 80 20 60 B2
8BC8:85 20 CF FF 85 C3 20 CF EF
8BD0:FF 85 C4 A0 02 4C 5C 84 6A
8BD8:08 20 B7 E9 A0 00 84 B5 55
8BE0:A9 02 85 BB AD 08 02 85 D0
8BE8:B7 AD 09 02 85 B8 AD 06 F8
8BF0:02 85 09 AD 05 02 85 08 A9
8BF8:A2 04 86 BA E8 86 B6 AD 5B
8C00:07 02 4C F1 03 A9 00 85 0A
8C08:B9 A0 00 A2 05 A9 80 85 A5
8C10:01 A5 01 30 FC C9 02 90 D9
8C18:0A C■ D0 F1 A9 ■■ 85 BB 36
8C20:4C A5 03 AD 00 04 85 08 27
8C28:AD 01 04 85 09 A2 02 BD C5
8C30:00 04 9D FE 03 E8 D0 F7 43
8C38:B1 B9 D9 0D 02 F0 1F A0 57
8C40:00 E6 B7 D0 02 E6 B8 E6 1B
8C48:B9 D0 02 E6 BA 20 90 03 9B
8C50:A5 BA C9 04 D0 E2 A5 B9 7B
8C58:C9 FE D0 DC F0 A7 C8 CC 82
8C60:0C 02 F0 4E 20 86 03 98 BC
8C68:18 65 B9 C9 FE D0 C9 A5 2F
8C70:BA C9 04 D0 C3 A2 E0 BD 0F
8C78:00 04 9D 02 03 E8 E0 FE E2
8C80:D0 F5 C6 BA E6 B9 E6 B9 A9
8C88:4C 06 03 98 A6 B8 18 65 E0
8C90:B7 90 04 E8 FC A5 B7 CD 74
8C98:0A 02 D0 2D 98 F0 02 8A 3B
8CA0:FC A5 B8 CD 0B 02 D0 21 B8
8CA8:68 68 A4 BB 8C 00 05 4C 1B
8CB0:AE E9 A4 BB A5 B7 91 B5 D0
8CB8:C8 A5 B8 91 B5 C8 84 BB 65
8CC0:D0 04 C6 BB D0 E4 4C 3A C4
8CC8:03 60 48 B9 2C 03 99 00 C0
8CD0:03 C8 C0 C5 D0 F5 68 4C 8D
8CD8:02 03 A6 3F A4 40 20 2D 10
8CE0:86 B0 04 F0 02 38 60 18 C2
8CE8:60 20 57 81 A2 00 86 3B 9A
8CF0:E8 20 D7 AA 20 51 82 F0 68
8CF8:04 C9 2C D0 09 20 6A 86 3D
8D00:A8 A5 C3 4C 0B 8D 20 D8 BD
8D08:82 A4 FD 85 3F 84 40 8D BF
8D10:00 9F 8C 01 9F 85 3D 20 62
8D18:C2 80 F0 13 C9 2C F0 F7 DC
8D20:C9 49 F0 07 C9 43 D0 07 05
8D28:A9 01 FC A9 00 85 B3 A2 B2
8D30:9D 86 B5 A9 00 85 B4 85 12
8D38:FE 20 2B 90 A5 B3 D0 03 E9
8D40:20 C3 8D A6 3F A4 40 20 A5
8D48:E4 86 85 A8 A0 9C 84 A9 DC
8D50:4C 79 8D A5 F7 18 69 02 F0
8D58:85 F7 90 02 E6 A7 A9 02 91
8D60:85 9B A4 F7 B1 A6 AA C8 7F
8D68:B1 A6 85 AB 86 AA A9 02 A5
8D70:38 E5 FE 85 A8 A9 9C 85 04
8D78:A9 20 B9 85 20 DF 8F A0 40
8D80:00 B1 A8 20 59 8E 90 03 48
8D88:4C 53 8D 20 F5 8D 20 DA 53
8D90:8C B0 0D 20 9A 8F 8A F0 DA
8D98:E6 30 E4 20 C3 8D F0 DF E7
8DA0:20 FE 80 0D 01 0F 20 12 03
8DA8:20 54 48 45 20 45 4E 44 3D
8DB0:20 8D A5 B3 D0 0A 20 FD 1C
8DB8:88 20 99 87 C0 20 D0 DB CF
8DC0:4C D5 80 20 49 82 A5 3F 68
8DC8:85 3D 20 FE 80 13 12 05 63
8DD0:41 44 44 52 20 20 43 4F A2
8DD8:44 45 01 09 20 56 41 4C 41
8DE0:55 45 01 05 20 41 53 43 58
8DE8:49 49 20 20 53 43 52 CE 1C
8DF0:A9 00 85 C7 60 A2 00 BD 59
8DF8:CB 02 20 A0 82 20 4C 82 38
8E00:E8 EC C9 02 D0 F1 BC D4 C2
8E08:96 20 4C 82 88 D0 FA A2 4A
8E10:00 BD CB 02 20 65 8A E8 CA
8E18:EC C9 02 D0 F4 38 A9 06 4D
8E20:ED C9 02 AA 20 4C 82 CA 93
8E28:D0 FA A2 00 A4 D3 BD CB 7C
8E30:02 91 D1 A9 01 91 F3 C8 86
8E38:E8 EC C9 02 D0 F0 4C D7 19
8E40:AA A8 8D CB 02 B9 E5 96 A4
8E48:48 18 2A 2A 2A 29 03 8D 01
8E50:C9 02 68 29 3F 8D CA 02 3A
8E58:60 20 41 8E AC C9 02 88 D7
8E60:A2 00 A5 A9 C9 9C D0 2C AC
8E68:A5 A8 C9 FE 90 2A C9 FF 6C
8E70:D0 06 C0 00 F0 22 D0 08 49
8E78:C0 02 30 1C C0 01 D0 06 EF
8E80:A2 01 A9 00 F0 05 A2 02 47
8E88:AD FE 9C 8D 00 9C AD FF 76
8E90:9C 8D 01 9C 86 FE 38 60 4A
8E98:A9 00 8D 00 9C 8D 01 9C F5
8EA0:A6 40 A5 3F 20 9A 82 20 5A
8EA8:4C 82 20 50 8F 20 02 90 27
8EB0:A0 03 BD 65 98 20 D2 FF D7
8EB8:E8 88 D0 F6 20 4C 82 AD DA
8EC0:CB 02 20 2A 8F 85 C1 C9 CA
8EC8:02 90 52 AA BD 1F 99 85 23
8ED0:C3 A0 00 20 3D 8F C0 03 A6
8ED8:D0 F9 85 C2 A5 C1 C9 08 89
8EE0:F0 7B A2 01 20 4C 8F 9D A8
8EE8:CB 02 E8 EC C9 02 D0 F4 45
8EF0:CA BD CB 02 20 A0 82 CA CF
8EF8:D0 F7 A5 C3 0A A0 03 A5 EB
8F00:C4 90 13 C8 4A 20 3D 8F 71
8F08:C0 07 D0 F9 A0 03 A5 C2 22
8F10:20 3D 8F 4C 1D 8F 20 3D E9
8F18:8F C0 07 D0 F9 A6 C1 BC C7
8F20:D8 96 20 4C 82 88 D0 FA EC
8F28:18 60 18 4A 08 AA BD E5 5F
8F30:97 28 90 04 29 0F 10 04 21
8F38:4A 4A 4A 4A 60 4A 85 C4 F8
8F40:90 06 B9 18 99 20 D2 FF D4
8F48:C8 A5 C4 60 A0 00 B1 A8 E4
8F50:E6 3F D0 02 E6 40 E6 A8 9B
8F58:D0 02 E6 A9 60 20 4C 8F 83
8F60:8D CC 02 A5 3F 85 FC A5 C3
8F68:40 85 FD AD CC 02 30 0E 80
8F70:18 65 FC 85 FC A5 FD 69 D0
8F78:00 85 FD 4C 90 8F 49 FF D2
8F80:A8 A5 FC 84 FC 18 E5 FC 56
8F88:85 FC A5 FD E9 00 85 FD 96
8F90:A6 FD A5 FC 20 9A 82 4C C3
8F98:1D 8F A5 B3 D0 03 4C 78 BD
8FA0:87 20 EA 88 F0 36 90 28 1B
8FA8:20 EA 88 F0 2F B0 21 AE DF
8FB0:77 02 E0 8C D0 1D A2 00 31
8FB8:86 3B 86 B3 CA 86 B4 A2 72
8FC0:9D 86 B5 A5 3F 8D 00 9F 31
8FC8:A5 40 8D 01 9F A2 01 60 76
8FD0:A2 00 60 E0 8A D0 D1 A2 39
8FD8:00 4C 77 96 4C D5 80 A5 C3
8FE0:9B 48 A9 02 85 9B 20 97 A7
8FE8:85 20 63 85 68 85 9B A0 C8
8FF0:02 20 CF FF 99 00 9C C8 E1
8FF8:D0 F7 AD 01 9C 85 B6 4C F8
9000:CC FF 18 AD CA 02 0A 6D 45
9008:CA 02 AA BD 65 98 60 A4 33
9010:F7 20 14 90 C8 D0 02 E6 35
9018:A7 60 08 A6 A7 E0 9A F0 77
9020:08 A6 F7 E0 FE D0 02 C6 02
9028:A7 28 60 20 AD 85 20 63 5C
9030:85 A0 00 20 CF FF D9 03 73
9038:00 D0 08 C8 C0 02 D0 F3 BE
9040:4C CC FF 20 E7 FF 20 42 7E
9048:F6 20 FE 80 0D 20 3F 20 5C
9050:57 52 4F 4E 47 20 44 49 0D
9058:53 4B 2E 2E 2E 8D 20 E4 6B
9060:FF C9 0D F0 C6 C9 03 D0 D8
9068:F5 4C D5 80 20 CD 82 E0 78
9070:24 B0 1F 86 AA 20 51 82 17
9078:C9 2C F0 2B 20 CD 82 86 1E
9080:AB A2 04 A5 AA DD 0F 99 7F
9088:CA B0 FA BD 14 99 C5 AB B4
9090:B0 87 20 FE 80 0D 3F 20 B6
9098:49 4E 56 41 4C 49 44 20 01
90A0:54 2F 53 8D 4C D5 80 4C 02
90A8:F8 80 20 57 81 20 2B 90 53
90B0:20 D7 AA A2 00 86 71 86 DA
90B8:49 86 F9 A9 A0 85 4A 20 C9
90C0:DC 91 20 D8 82 8D 39 03 06
90C8:A5 FD 8D 3A 03 A2 00 20 54
90D0:C2 80 C9 3A F0 04 C9 22 9D
90D8:D0 06 4C 01 93 20 C2 80 A0
90E0:C9 00 D0 03 4C CB 92 9D 85
90E8:34 03 E8 E0 03 D0 EE A2 EB
90F0:00 20 C2 80 F0 12 9D 3B C0
90F8:03 20 FE 82 B0 02 A9 30 BC
9100:9D 44 03 E8 E0 08 D0 E9 A4
9108:A9 00 9D 3B 03 AA 86 3C 73
9110:A0 00 BD 65 98 D9 34 03 29
9118:D0 08 E8 C8 C0 03 D0 F2 F5
9120:F0 0E E8 C8 C0 03 D0 FA 97
9128:E6 3C E0 AB D0 E2 F0 13 AB
9130:A6 3C 86 C1 A2 00 BD E5 19
9138:96 A8 29 3F C5 C1 F0 09 0A
9140:E8 D0 F3 20 45 AB 4C C1 BF
9148:92 98 29 C0 18 2A 2A 2A F3
9150:8D C9 02 8E CB 02 86 C2 0C
9158:8A 20 2A 8F C9 02 90 75 F3
9160:C9 08 D0 03 EE C9 02 AA 02
9168:BD 1F 99 86 3C 85 FB A0 5E
9170:00 A2 00 20 9B 91 C0 03 E5
9178:D0 F9 86 FA AC C9 02 88 1C
9180:F0 2B BD 44 03 C9 30 D0 53
9188:0D BD 45 03 C9 30 D0 06 31
9190:E8 E8 D0 EB 68 68 A6 C2 30
9198:4C 40 91 4A 85 C4 90 09 32
```

```
91A0:B9 18 99 DD 44 03 D0 EC 74
91A8:E8 C8 A5 C4 60 A5 FB 0A 0F
91B0:A5 C4 A0 03 90 31 C8 4A 41
91B8:48 08 68 85 C3 68 20 CD 35
91C0:91 A0 03 A5 C3 48 71 20 D1
91C8:9C 91 4C EA 91 20 9B 91 AC
91D0:C0 07 D0 F9 60 AD 3B 03 03
91D8:D0 BC F0 38 A2 19 A9 00 02
91E0:9D 34 03 CA 10 FA 60 20 3A
91E8:CD 91 BD 3B 03 D0 A7 A6 14
91F0:FA AC C9 02 88 98 0A 85 56
91F8:FC A0 01 BD 3B 03 91 7A 42
9200:E8 C8 C6 FC D0 F5 AE C9 F9
9208:02 D0 06 20 DD 82 9D CB 25
9210:02 CA D0 F7 A5 71 C9 08 11
9218:D0 35 CE C9 02 AD CC 02 CB
9220:38 E9 02 B0 03 CE CD 02 18
9228:38 ED 39 03 85 FF AD CD 91
9230:02 ED 3A 03 A8 05 FF 90 33
9238:09 98 D0 0D A6 FF 30 09 91
9240:10 0A C8 D0 04 A6 FF 30 01
9248:03 4C 43 91 8E CC 02 20 4F
9250:8D 93 90 03 4C 5D 93 AD 10
9258:39 03 AE 3A 03 20 AC 92 D8
9260:AD C9 02 C9 02 08 AE CB 05
9268:02 20 AC 92 28 90 0E F0 E5
9270:02 18 80 38 AE CD 02 AD 8E
9278:CC 02 20 AD 92 A9 2E 20 1B
9280:D2 FF AD C9 02 20 F2 92 6A
9288:A9 43 8D 77 02 A9 20 8D 01
9290:78 02 A2 02 A9 07 20 6B FB
9298:93 20 60 A5 20 DC 91 A9 37
92A0:00 85 71 85 7A E6 F9 4C 5D
92A8:C2 90 38 80 18 A0 00 91 37
92B0:49 B0 07 C8 8A 91 49 20 61
92B8:BA 92 E6 49 D0 02 E6 4A F7
92C0:60 C6 F9 A9 00 8D C9 02 6D
92C8:4C 82 92 A5 49 F0 20 4C FB
92D0:C4 93 20 FE 80 4F 55 54 71
92D8:50 55 54 28 59 2F 4E 29 D5
92E0:20 BF 20 CF FF C9 0D F0 39
92E8:04 C9 59 F0 D3 68 68 4C 1A
92F0:D5 80 18 6D 39 03 85 C1 9D
92F8:AA A9 00 6D 3A 03 85 C2 60
9300:60 A0 00 AE 39 03 8E 40 9D
9308:03 AE 3A 03 8E 41 03 C9 1D
9310:22 F0 16 20 51 82 D0 03 82
9318:4C C4 93 20 51 82 F0 16 97
9320:20 DD 82 99 43 03 C8 D0 41
9328:F2 20 C8 80 C9 22 F0 06 B0
9330:99 43 03 C8 D0 F3 98 F0 5A
9338:DF 8C 42 03 98 8C C9 02 77
9340:C8 C8 C8 84 FA 20 F2 92 30
9348:20 8D 93 B0 10 A2 00 BD 29
9350:40 03 20 AA 92 E8 E4 FA 04
9358:D0 F5 4C 7D 92 20 6A 86 37
9360:8D 3A 03 A5 C3 8D 39 03 61
9368:4C 43 91 85 C6 A5 C2 20 83
9370:C3 82 9D 78 02 A5 FD 9D 95
9378:77 02 A5 C1 20 C3 82 9D 5F
9380:7A 02 A5 FD 9D 79 02 A9 7A
9388:20 9D 7B 02 60 84 FB AC 70
9390:3A 03 AD C9 02 18 6D 39 6C
9398:03 AA 90 01 C8 8A D0 01 21
93A0:88 CA 20 2D 86 90 0D AE D4
93A8:39 03 AC 3A 03 20 2D 86 DF
93B0:B0 0E F0 0C AD 39 03 85 70
93B8:C1 AD 3A 03 85 C2 38 80 CB
93C0:18 A4 FB 60 A0 A0 A2 00 6F
93C8:86 3F 84 40 86 3C 20 D2 CF
93D0:92 20 2B 90 A0 00 A9 36 46
93D8:85 01 B1 3F AA C8 B1 3F 48
93E0:84 FA A8 A9 37 85 01 20 AA
93E8:4A 86 48 A5 3C F0 13 E4 EA
93F0:AB D0 04 C4 AA F0 16 98 CC
93F8:48 8A 48 20 73 85 68 AA 1F
9400:68 A8 84 AA 86 AB 68 20 96
9408:B7 85 4C 13 94 68 85 9B 16
9410:20 97 85 20 6B 85 A4 FA 97
9418:C8 A9 36 85 01 B1 3F AA 27
9420:C8 A9 36 85 01 B1 3F 48 CC
9428:A9 37 85 01 68 20 D2 FF 1E
9430:CA F0 2E E6 9B F0 07 C8 A6
9438:D0 E7 E6 40 D0 E3 98 48 34
9440:8A 48 20 73 85 20 97 85 5D
9448:20 63 85 20 CF FF 85 AA 41
9450:20 CF FF 85 AB A9 02 20 FD
9458:B7 85 68 AA 68 A8 4C 37 2C
9460:94 C6 F9 F0 ?? C8 A9 01 8B
9468:85 3C 4C D6 93 20 73 85 E3
9470:4C D5 80 A2 ?? 86 10 20 C9
9478:C2 95 A5 3C D0 57 A9 80 98
9480:85 10 D0 77 20 03 ?? A4 C6
9488:3C B9 50 03 ?? 9E 94 8D 16
9490:A3 94 B9 51 03 8D 9F 94 1F
9498:8D A4 94 A2 27 BD FF FF 9E
94A0:49 ?? 9D FF FF CA 10 F5 83
94A8:60 A4 3C B9 54 03 C9 FF 90
94B0:F0 2A 20 87 94 A5 3C 18 25
94B8:69 04 85 3C D0 1B A5 3C 86
94C0:F0 1A 20 87 94 A5 3C 38 51
94C8:E9 04 85 3C 4C D9 94 4C 9B
94D0:78 95 20 CA 8D A9 00 85 E4
94D8:3C 20 87 94 20 03 89 20 A2
94E0:E4 FF F0 FB C9 03 F0 9C 33
94E8:C9 20 F0 E3 C9 91 F0 CE A0
94F0:C9 11 F0 B5 C9 87 D0 E7 B2
94F8:20 87 94 A2 27 A9 A0 9D 8F
9500:00 04 CA 10 FA 20 FE 80 5D
9508:12 13 41 44 44 52 45 53 B6
9510:53 BA A0 00 84 FB 20 E4 E0
9518:FF F0 FB A4 FB C9 87 D0 30
9520:04 24 10 10 AD 20 FE 82 C7
9528:B0 0D C0 04 F0 E8 C8 91 95
9530:7A 20 D2 FF ?? D0 DD C9 88
9538:14 D0 13 88 30 D4 84 FB 66
9540:A0 95 A9 4A 20 1E AB 4C 18
9548:16 95 9D 20 9D 00 C9 0D 27
9550:D0 21 C0 04 D0 C0 20 D8 27
9558:82 48 A4 FD AA 20 2D 86 02
9560:B0 04 F0 02 68 60 20 8F B7
9568:95 68 85 3F A5 FD 85 40 8D
9570:4C A9 95 C9 03 D0 9F 60 76
9578:20 8F 95 A4 3C B9 52 03 05
9580:AA B9 53 03 A8 86 3F 84 6C
9588:40 20 87 94 4C A9 95 A5 EF
9590:3F A6 40 38 E5 3D B0 01 17
9598:CA A4 3B A5 3D 99 00 9E 03
95A0:C8 8A 99 00 9E C8 84 3B 62
95A8:60 A4 3B A6 3F 8A 99 00 56
95B0:9F A5 40 99 01 9F A8 20 AE
95B8:E4 86 85 A8 20 B9 85 4C 72
95C0:DF 8F A0 01 84 FA 88 84 89
95C8:3C A9 04 8D D9 95 A9 28 76
95D0:8D D8 95 A0 00 A2 13 BD 24
95D8:FF FF E8 D9 2C 99 D0 3D 65
95E0:C8 C0 02 F0 04 C0 04 D0 EB
95E8:EE 84 FC A4 3C AD D8 95 76
95F0:99 50 03 AD D9 95 99 51 E1
95F8:03 20 46 96 20 2D 86 B0 53
9600:07 F0 05 A4 FC 4C 1D 96 C1
9608:20 46 96 98 A4 3C 99 53 CF
9610:03 8A 99 52 03 C8 C8 C8 4F
9618:C8 84 3C D0 08 C0 02 B0 57
9620:04 A0 02 D0 B0 AD D8 95 48
9628:18 69 28 8D D8 95 90 03 DA
9630:EE D9 95 E6 FA A5 FA C9 9A
9638:16 90 98 A9 FF A4 3C 99 E6
9640:50 03 60 20 87 94 A2 0A 42
9648:A4 3C B9 50 03 8D 59 96 AA
9650:B9 51 03 8D 5A 96 A0 01 57
9658:BD FF FF C9 30 B0 02 09 52
9660:40 91 7A C8 E8 E0 0E D0 A5
9668:EF 20 D8 82 AA A4 FD A5 62
9670:7A 38 E9 04 85 7A 60 A9 E6
9678:00 85 B4 85 3B 85 F8 8A 62
9680:F0 03 20 89 88 20 D7 AA A2
9688:68 68 A5 A8 85 9B 20 5C 7A
9690:8A 20 63 85 A9 08 85 12 5A
9698:A6 40 A5 3F 4C 5F 89 4F 14
96A0:46 4C 41 52 4C 46 41 54 A3
96A8:4C 4C 00 44 00 49 00 48 C0
96B0:00 40 00 43 00 58 00 24 A7
96B8:00 00 59 82 3F 81 2D 82 16
96C0:FF 81 07 89 14 83 E8 8C D4
96C8:0A 89 79 8A D5 85 A9 90 DD
96D0:E7 80 ED 86 00 08 05 02 64
96D8:0A 0A 07 05 05 06 03 03 08
96E0:05 05 03 03 03 41 A1 40 03
96E8:40 40 A1 A7 40 49 A1 67 C6
96F0:40 40 E1 E7 40 AE A1 40 49
96F8:40 40 A1 A7 40 4A E1 40 34
9700:40 40 E1 E7 40 F6 A2 40 7D
9708:40 AB A2 A8 40 46 A2 68 E9
9710:40 EB E8 E8 40 AF A2 40 4C
9718:40 40 A2 A8 40 4B E2 40 8B
9720:40 40 E2 E8 40 42 A3 40 FC
9728:40 40 A3 A9 40 47 A3 69 66
9730:40 F7 E3 E9 40 B0 A3 40 E4
9738:40 40 A3 A9 40 45 E3 40 C5
9740:40 40 E3 E9 40 43 A4 40 53
9748:40 40 A4 AA 40 48 A4 6A BD
9750:40 F7 E4 EA 40 B1 A4 40 3B
9758:40 40 A4 AA 40 44 E4 40 14
9760:40 40 E4 EA 40 40 A0 40 8F
9768:40 97 A0 98 40 5B 40 51 7C
9770:40 D7 E0 D8 40 B2 A0 40 AD
9778:40 97 A0 98 40 4F E0 53 9F
9780:40 40 E0 40 40 95 9F 96 2E
9788:40 95 9F 96 40 50 9F 52 6F
9790:40 D5 DF D6 40 B3 9F 40 0F
9798:40 95 9F 96 40 4C DF 54 F1
97A0:40 D5 DF D6 40 99 A5 40 C2
97A8:40 99 A5 AC 40 5D A5 5C FC
97B0:40 D9 E5 EC 40 B4 A5 40 62
97B8:40 40 A5 AC 40 4D E5 40 DA
97C0:40 40 E5 EC 40 9A A6 40 A5
97C8:40 9A A6 AD 40 5E A6 78 AF
97D0:40 DA E6 ED 40 B5 A6 40 F8
97D8:40 40 A6 AD 40 4E E6 40 31
97E0:40 40 E6 ED 40 06 00 02 18
97E8:20 05 10 09 90 87 00 03 A1
97F0:30 0C 00 0A A0 96 00 22 5D
97F8:20 05 10 99 90 87 00 03 BA
9800:30 0C 00 0A A0 06 00 02 0C
9808:20 05 10 99 90 87 00 03 CB
9810:30 0C 00 0A A0 06 00 02 1C
9818:20 05 10 B9 90 87 00 03 DD
9820:30 0C 00 0A A0 06 00 22 4C
9828:20 00 00 99 90 87 00 33 D8
```

```
9830:40 0C 00 0A 00 56 50 22 41
9838:20 05 00 99 90 87 00 33 2A
9840:40 0C 00 AA C0 56 00 22 C0
9848:20 05 00 99 90 87 00 03 0A
9850:30 0C 00 0A A0 56 00 22 BD
9858:20 05 00 99 90 87 00 03 1A
9860:30 0C 00 0A A0 3F 3F 3F 0D
9868:42 52 4B 52 54 49 52 54 9E
9870:53 53 45 49 43 4C 49 50 8B
9878:4C 50 50 48 41 50 4C 41 97
9880:50 48 50 43 4C 43 53 45 85
9888:43 43 4C 56 43 4C 44 53 42
9890:45 44 54 59 41 54 41 59 CC
9898:54 58 41 54 41 58 54 58 E3
98A0:53 54 53 58 4C 44 59 4C F2
98A8:44 58 53 54 59 53 54 58 DA
98B0:43 50 59 43 50 58 44 45 A8
98B8:59 44 45 58 49 4E 59 49 55
98C0:4E 58 4C 44 41 53 54 41 3E
98C8:4F 52 41 41 4E 44 45 4F CF
98D0:52 41 44 43 43 4D 50 53 7B
98D8:42 43 41 53 4C 52 4F 4C EF
98E0:4C 53 52 52 4F 52 42 49 0E
98E8:54 44 45 43 49 4E 43 42 7E
98F0:50 4C 42 4D 49 42 56 43 BD
98F8:42 56 53 42 43 43 42 43 5E
9900:53 42 4E 45 42 45 51 4A 9F
9908:53 52 4A 4D 50 4E 4F 50 42
9910:24 1F 19 12 11 12 13 15 6D
9918:23 28 24 29 2C 58 59 00 73
9920:00 04 34 54 05 BE 5E 04 04
9928:04 34 8E 54 32 30 34 03 3F
9930:4D 2D 45 00 06 00 00 4D 7B
9938:2D 52 00 04 80 00 4D 2D A2
9940:57 00 06 20 11 20 20 12 3D
9948:20 20 44 45 4D 4F 4E 20 D4
9950:56 31 2E 30 20 20 0D 20 7F
9958:20 20 42 59 20 56 2E 42 7A
9960:41 52 44 45 4C 4C 0D 00 53
```

Vaughan Bardell said he had other features planned for DeMON, but space limitations prevented their inclusion. He lives in Hastings, New Zealand.

GEOS TEXT SCRAP MAKER

By Charles Kunz

Have you ever wanted to convert a SpeedScript document to geoWrite format? I can't tell you how many times I've wanted to do this. Gazette published geoWrite Converter (April 1990), but it only converts geoWrite documents to SpeedScript or ASCII. I needed something that would convert the other way around. Enter GEOS Text Scrap Maker.

I am the proud owner of geoWrite 1.1 and GEOS 1.2. (That's no typo folks; I've owned it since December 1986.) Probably many of you also have this early version of GEOS and are aware that it provides no utility for such conversions.

GEOS Text Scrap Maker runs like (and has many of its routines modified from) the Print Shop To GEOS converter (April 1987 Gazette).

Entering the Program

GEOS Text Scrap Maker is written entirely in BASIC. To help avoid typing errors, enter it with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Before exiting Proofreader, be sure to save a copy of the program to disk. I like to keep Scrap Maker on my GEOS work disk with geoWrite and my geoWrite documents.

Scrap Maker writes to disk, so make sure it has been entered properly before you use it with important files. A syntax error could be fatal to your precious files. Caution: Scrap Maker creates a temporary file called S on your GEOS work disk. So if you already have a file on the disk with that name, be sure to rename it.

Converting

Before using Scrap Maker, make sure there's a Text Scrap file on your work disk; otherwise the conversion will not be complete. Create a Text Scrap if you don't have one. To do this, double-click the geoWrite icon and then cut or copy any text from a geoWrite file. Once you have a Text Scrap on disk, you can use Scrap Maker.

Load and run Scrap Maker as you would any BASIC program. If you are within the GEOS environment, just double-click on the Scrap Maker icon.

Scrap Maker first asks you to insert the disk that contains the file that you want to convert and then asks for the conversion type you want to execute. You have three conversion options: SpeedScript to GEOS, Commodore ASCII to GEOS, and true ASCII to GEOS. Next, Scrap Maker requests the name of the file to be converted. If the file is too large—the maximum size is about 6K—you'll get an overflow error, and Scrap Maker will restart.

After the file loads, Scrap Maker translates the file in memory, reporting on the status as it converts and on how large the text will be. Scrap Maker then asks for a GEOS work disk (the one with the Text Scrap already on it), and it writes the new Text Scrap on it. Finally, Scrap Maker requests the GEOS master or boot disk. After GEOS boots up, you can paste the new Text Scrap into a Text Album or geoWrite file. The text you just pasted will be in the BSW font, so if you want a different font, make the change within geoWrite.

Helpful Hints

Since Scrap Maker can convert only 6K at a time, large documents will have to be broken down and saved as smaller ones. Convert each of these small documents one at a time, and after each conversion, paste the document into a geoWrite file. After all the conversions have been done, the end product will be in one geoWrite file.

Scrap Maker is written entirely in BASIC, so it is quite easy to modify. I have assumed that Commodore ASCII files and true ASCII files will be SEQ files, which covers most cases. You can change this to suit your needs if you have true ASCII files saved as PRG files. You can also add conversion options if you like, such as converting PaperClip III files.

Compatibility

I have tested this program with GEOS 1.2 and geoWrite 1.1. This is the only version of geoWrite available to me. Experiment with whatever version you have, but be sure to back up your disk just in case something goes awry.

SCRAP MAKER

```
EE 5 REM COPYRIGHT 1992 COMPUT
     E PUBLICATIONS INTL LTD -
     ALL RIGHTS RESERVED
PG 10 POKE52,32:POKE56,32:CLR:
     PRINT"{CLR}{7}{N}{H}";:P
     OKE53281,6:POKE53280,14:
     AD=8192
KJ 20 HD$="{CLR}{RVS} GEOS TEX
     T SCRAP MAKER (FILE CONV
     ERTER) ":MC=6000
QJ 30 PRINTHD$
DR 40 GOTO200
BH 50 REM ---- SEARCH DIR FOR
     {SPACE}TRACK AND SECTOR
SD 60 FF=0:PRINT#15,"U1:2 0"+S
     TR$(T)+STR$(S)
SS 70 GET#2,A$:TN=ASC(A$+CHR$(
     0)):GET#2,A$:SN=ASC(A$+C
     HR$(0))
DC 80 FORN=0TO7:PRINT#15,"B-P:
     2,"+STR$(32*N+2)
RQ 90 GET#2,A$:IFA$<>CHR$(131)
     THEN160
RP 100 GET#2,A$:TP=ASC(A$+CHR$
```

```
        (0)):GET#2,A$:SP=ASC(A$
        +CHR$(0)):H$=""
GB 110  GET#2,A$:IFA$<>CHR$(160
        )THENH$=H$+A$:GOTO110
SD 120  IFH$<>DI$THEN160
FR 130  FF=1:KP=N:N=7
MQ 140  PRINT#15,"B-P:2,"+STR$(
        32*KP+30)
ER 150  GET#2,A$:SL=ASC(A$+CHR$
        (0)):GET#2,A$:SH=ASC(A$
        +CHR$(0))
DX 160  NEXT:IFTN=0THENRETURN
SC 170  IFFF=1THENRETURN
CB 180  T=TN:S=SN:GOTO60
EF 190  REM ---- REQUEST FOR CO
        NVERSION TYPE
DH 200  PRINT"{DOWN}INSERT DISK
         WITH FILE TO BE CONVER
        TED."
DP 210  PRINT"{DOWN}SELECT CONV
        ERSION:{DOWN}"
FS 220  PRINT" 1) SPEEDSCRIPT T
        O GEOS"
HD 230  PRINT" 2) COMMODORE ASC
        II TO GEOS"
CD 240  PRINT" 3) TRUE ASCII TO
         GEOS{4 UP}"
DS 250  GETZ$:IFZ$<"1"ORZ$>"3"T
        HEN250
FA 260  IFZ$="1"THENX$=",P,R"
AR 270  IFZ$="2"THENX$=",S,R"
SS 280  IFZ$="3"THENX$=",S,R"
AC 290  FORN=1TOVAL(Z$):PRINT:N
        EXT:PRINT"*";:FORN=1TO4
        -VAL(Z$):PRINT:NEXT
FS 300  REM ---- READ FILE INTO
         MEMORY
MQ 310  N$="":INPUT"{DOWN}FILEN
        AME";N$:IFN$=""THEN310
HB 320  OPEN15,8,15:OPEN8,8,0,N
        $+X$:INPUT#15,EN,EB$,ET
        ,ES
MX 330  IFEN<>0THENCLOSE8:CLOSE
        15:PRINT"{DOWN}";EB$:N$
        ="":GOTO210
DS 340  PRINTHD$:PRINT"{DOWN}LO
        ADING {CYN}";N$
CG 350  POKE185,0:POKE780,0:POK
        E781,0:POKE782,32:SYS65
        493:CLOSE8:CLOSE15:SI=0
DP 360  EA=PEEK(781)+PEEK(782)*
        256:IF(EA-AD)>MCTHEN970
PH 370  PRINT"{DOWN}{7}PLEASE W
        AIT, TRANSLATING":PRINT
        "{CYN}";N$;"{7} ...
        {DOWN}"
EP 380  PRINT" 0%{3 SPACES}COMP
        LETE{UP}":FORN=ADTOEA-1
        :C=PEEK(N):ONVAL(Z$)GOT
        O390,470,520
QK 390  IFC=0THENC=64:GOTO520
BJ 400  IFC>=1ANDC<=26THENC=C+9
        6:GOTO520
GM 410  IFC=27THENC=91:GOTO520
HG 420  IFC=29THENC=93:GOTO520
PF 430  IFC=30THENC=94:GOTO520
SR 440  IFC=31THENC=13:GOTO520
FM 450  IFC>=32ANDC<=63)OR(C>=
        65ANDC<=90)THEN520
QA 460  GOTO530:REM SPEEDSCRIPT
         CONTROL CODES CAN'T TR
        ANSLATE
AQ 470  IFC=13OR(C>=32ANDC<=64)
        OR(C>=91ANDC<=95)THEN52
        0
CS 480  IFC>=65ANDC<=90THENC=C+
        32:GOTO520
RD 490  IFC>=97ANDC<=122THENC=C
        -32:GOTO520
MJ 500  IFC>=193ANDC<=218THENC=
        C-128:GOTO520
RD 510  GOTO530:REM WEIRD COMMO
        DORE ASCII CAN'T TRANSL
        ATE
AP 520  POKEAD+SI,C:SI=SI+1
KJ 530  PRINTINT((N-AD)/(EA-1-A
        D)*100)"{LEFT}%{UP}":NE
        XT:SI=SI+4
FJ 540  PRINT"{DOWN}{CYN} TEXT
        {SPACE}SCRAP WILL BE"IN
        T(SI/1024+.5)"{LEFT}K"
AH 550  REM ---- REQUEST FOR GE
        OS WORK DISK WITH TEXT
        {SPACE}SCRAP FILE
BB 560  PRINT"{DOWN}{7}INSERT G
        EOS WORK DISK IN DRIVE,
         HIT"
CE 570  PRINT"{RVS}RETURN{OFF}
        {SPACE}WHEN READY."
QG 580  GETA$:IFA$<>CHR$(13)THE
        N580
CG 590  PRINT"{DOWN}SAVING
        {CYN}TEXT SCRAP{7} FILE
        ...{DOWN}":PRINT" 0%
        {3 SPACES}COMPLETE{UP}"
DS 600  REM ---- WRITE FILE CAL
        LED 'S'
JJ 610  OPEN15,8,15,"I0":INPUT#
        15,EN,EB$,ET,ES:IFEN<>0
        THEN940
FG 620  OPEN2,8,2,"S,U,W":INPUT
        #15,EN,EB$,ET,ES:IFEN<>
        0THEN940
BE 630  HS=INT(SI/256):LS=SI-HS
        *256:SF=HS
SP 640  PRINT#2,CHR$(LS)CHR$(HS
        )CHR$(23)CHR$(9)CHR$(0)
        CHR$(0);
KR 650  FORN=0TOSI-5:PRINT#2,CH
        R$(PEEK(AD+N));:PRINTIN
        T(N/(SI-5)*100)"{LEFT}%
        {UP}"
DE 660  NEXT:CLOSE2
BQ 670  DATA84,101,120,116,32,3
        2,83,99,114,97,112
CD 680  P$="":FORN=0TO10:READX:
        P$=P$+CHR$(X):NEXT
FF 690  OPEN2,8,2,"#":T=18:S=1:
        DI$=P$:GOSUB60
RR 700  IFFF=0THENPRINT"{DOWN}
        {RVS}NO TEXT SCRAP FILE
        ":GOTO870
BE 710  T1=T:S1=S:FS=256*SH+SL-
        1:T2=TP:S2=SP:K1=KP
JD 720  REM ---- SWAP T/S POINT
        ERS AND DELETE 'S' FILE
QS 730  T=18:S=1:DI$="S":GOSUB6
        0
DK 740  PRINT#15,"B-P:2,"+STR$(
        32*KP+3)
CX 750  PRINT#2,CHR$(T2)CHR$(S2
        );
CD 760  PRINT#15,"B-P:2,"+STR$(
        32*KP+30)
EF 770  FH=INT(FS/256):FL=FS-25
        6*FH
XQ 780  PRINT#2,CHR$(FL)CHR$(FH
        );
GC 790  PRINT#15,"U2:2 0"+STR$(
        T)+STR$(S)
QX 800  PRINT#15,"U1:2 0"+STR$(
        T1)+STR$(S1)
HB 810  PRINT#15,"B-P:2,"+STR$(
        32*K1+3)
DH 820  PRINT#2,CHR$(TP)CHR$(SP
        );
XP 830  PRINT#15,"B-P:2,"+STR$(
        32*K1+30)
JC 840  PRINT#2,CHR$(SF+1)CHR$(
        0);
KA 850  PRINT#15,"U2:2 0"+STR$(
        T1)+STR$(S1)
AR 860  PRINT#15,"S0:S"
EC 870  CLOSE2:CLOSE15
QK 880  PRINT"{2 DOWN}{7}DONE..
        . INSERT GEOS MASTER DI
        SK IN"
FS 890  PRINT"DRIVE THEN HIT
        {RVS}RETURN{OFF} TO BOO
        T."
AR 900  GETA$:IFA$<>CHR$(13)THE
        N900
HE 910  PRINT"{CLR}"CHR$(142):L
        OAD"GEOS",8,1
XX 920  END
QK 930  REM ---- IN CASE OF DIS
        K ERROR....
KQ 940  PRINT"{CLR}";SPC(20-LEN
        (EB$)/2)"{DOWN}{YEL}"+E
        B$
GG 950  PRINT"{DOWN}{GRN}
        {11 SPACES}RESETTING DR
        IVE...{7}"
MC 960  PRINT#15,"UJ":FORN=1TO1
        500:NEXT:CLOSE15:CLOSE2
        :GOTO590
AQ 970  PRINT"{DOWN}"SPC(8)"
        {YEL}** OVERFLOW ERROR
        {SPACE}**{7}{DOWN}"
SD 980  PRINT"THE REQUESTED FIL
        E EXCEEDS THE"MC
KD 990  PRINT"CHARACTER MAXIMUM
        .{2 SPACES}PRESS {RVS}R
        ETURN{OFF} TO":PRINT"RE
        TRY."
CC 1000 GETA$:IFA$<>CHR$(13)TH
        EN1000
DK 1010 GOTO30
```

Charles Kunz, 23, has a B.S. in computer science. He enjoys rock-'n'-roll, writing to pen pals, and comedy. He lives in Holbrook, New York.

TACK TRUCK

By Scott Gifford

In the year 2000, the economy is in worse shape than it is now. Competition in the thumbtack delivery business is especially fierce. Drivers go to any length to be the first to deliver their tacks.

In this two-player arcade-style game for the 64, drivers duel to be the first out of the parking lot of an office supply store. In an attempt to gain an advantage, the drivers open the rear doors of their trucks, allowing a steady stream of thumbtacks to pour onto the pavement. Watch where you steer your truck; even the best tires can't survive passing over these tacks.

Typing It In

Tack Truck is written entirely in machine language. To enter it, you'll have to use MLX, our machine language entry program; see "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: C000
Ending address: C9F7

Be sure to save a copy of the program before you exit MLX.

Start Your Engines

Load Tack Truck with the ,8,1 extension, and then type *SYS 49152*. Before the game begins, you'll have a chance to change various options. You can select the number of games that must be won before a winner is declared. You can select the speed of the trucks (1 is very fast), and you can decide on the number of obstacles. These latter items are the remnants of previous duels.

Both players can use their joysticks to select truck colors. Both must press their fire buttons simultaneously to start the game.

At the beginning of each round, player 1's truck appears in the upper left corner; player 2's truck appears in the lower right. Trucks are moving as soon as the game starts, so be ready. Avoid the border of the parking lot, avoid your opponent's truck, and avoid the trails of tacks that litter the parking lot. The player who survives the longest wins the round and collects points. If both drivers crash at the same time, no points are awarded. Press both fire buttons to restart a game.

TACK TRUCK

```
C000:AD 0E DC 29 FE 8D 0E DC 31
C008:A5 01 29 FB 85 01 A9 00 05
C010:85 FB A9 38 85 FC A9 00 7F
C018:85 FD A9 D0 85 FE A2 04 8F
C020:A0 00 B1 FD 91 FB C8 D0 E6
C028:F9 CA F0 07 E6 FC E6 FE DF
C030:4C 22 C0 A5 01 09 04 85 8C
C038:01 AD 0E DC 09 01 8D 0E AA
C040:DC AD 18 D0 29 F0 18 09 F1
C048:0E 8D 18 D0 A9 D7 85 FB F7
C050:A9 38 85 FC A9 BC 85 FD 7E
C058:A9 C5 85 FE A0 28 B1 FD C7
C060:91 FB 88 D0 F9 A9 00 8D CB
C068:20 D0 8D 21 D0 8D B3 C5 DB
C070:8D B4 C5 A9 93 20 D2 FF FB
C078:A9 FF 85 9E A9 D7 85 9F C0
C080:A2 06 A9 07 8D 70 C9 20 5C
C088:55 C9 A9 18 85 9E A9 D9 B1
C090:85 9F A2 06 A9 02 8D 70 52
C098:C9 20 55 C9 A9 FF 85 FB A2
C0A0:A9 03 85 FC A9 E4 85 FD 22
C0A8:A9 C5 85 FE A2 0D A0 28 C3
C0B0:B1 FD 91 FB 88 D0 F9 18 10
C0B8:A5 FB 69 28 85 FB A5 FC 20
C0C0:69 00 85 FC 18 A5 FD 69 34
C0C8:28 85 FD A5 FE 69 00 85 FC
C0D0:FE CA D0 DA A9 99 20 D2 13
C0D8:FF 18 A0 0B A2 0F 20 F0 A7
C0E0:FF A0 00 B9 ED C7 20 D2 C7
C0E8:FF C8 C0 18 D0 F5 18 A0 65
C0F0:07 A2 11 20 F0 FF A0 00 8B
C0F8:B9 05 C8 20 D2 FF C8 C0 9C
C100:1C D0 F5 18 A0 02 A2 13 6B
C108:20 F0 FF A0 00 B9 21 C8 D3
C110:20 D2 FF C8 C0 21 D0 F5 07
C118:18 A0 02 A2 14 20 F0 FF 3D
C120:A0 00 B9 42 C8 20 D2 FF BB
C128:C8 C0 21 D0 F5 18 A0 09 CB
C130:A2 16 20 F0 FF A0 00 B9 D9
C138:63 C8 20 D2 FF C8 C0 1A 8F
C140:D0 F5 18 A0 06 A2 18 20 C1
C148:F0 FF A0 00 B9 7D C8 20 CD
C150:D2 FF C8 C0 1B D0 F5 20 8A
C158:7E C9 20 95 C9 20 AC C9 DC
C160:20 B3 C9 20 BA C9 A5 C5 2A
C168:C9 04 D0 2D AD 8D 02 F0 57
C170:06 CE B7 C5 4C 7A C1 EE BC
C178:B7 C5 AD B7 C5 C9 00 D0 A0
C180:05 A9 14 8D B7 C5 C9 15 C9
C188:D0 05 A9 01 8D B7 C5 20 F1
C190:7E C9 A9 08 20 D1 C9 A9 01
C198:00 C9 05 D0 2D AD 8D 02 79
C1A0:F0 06 CE B8 C5 4C AB C1 FB
C1A8:EE B8 C5 AD B8 C5 C9 33 09
C1B0:D0 05 A9 00 8D B8 C5 C9 B7
C1B8:FF D0 05 A9 32 8D B8 C5 AA
C1C0:20 95 C9 A9 08 20 D1 C9 BB
C1C8:A9 00 C9 03 D0 2B AD 8D A6
C1D0:02 F0 06 CE B9 C5 4C DC 99
C1D8:C1 EE B9 C5 AD B9 C5 C9 36
C1E0:15 D0 05 A9 01 8D B9 C5 D5
C1E8:C9 00 D0 05 A9 14 8D B9 2E
C1F0:C5 20 BA C9 A9 08 20 D1 D2
C1F8:C9 AD 00 DC 20 D4 C8 E0 61
C200:03 D0 19 CE B5 C5 AD B5 21
C208:C5 C9 00 D0 05 A9 0F 8D 6A
C210:B5 C5 20 AC C9 A9 10 20 E5
C218:D1 C9 A2 00 E0 04 D0 17 1D
C220:EE B5 C5 AD B5 C5 C9 10 86
C228:D0 05 A9 01 8D B5 C5 20 8B
C230:AC C9 A9 08 20 D1 C9 AD BD
C238:01 DC 20 D4 C8 E0 03 D0 67
C240:19 CE B6 C5 AD B6 C5 C9 D6
C248:00 D0 05 A9 0F 8D B6 C5 1F
C250:20 B3 C9 A9 08 20 D1 C9 D4
C258:A2 00 E0 04 D0 17 EE B6 03
C260:C5 AD B6 C5 C9 10 D0 05 9C
C268:A9 01 8D B6 C5 20 B3 C9 FF
C270:A9 10 20 D1 C9 AD 00 DC D1
C278:0D 01 DC 29 10 F0 03 4C 89
C280:66 C1 A9 93 20 D2 FF A9 0E
C288:04 8D B1 C5 A9 03 8D B2 2D
C290:C5 A9 00 8D 20 D0 8D BC 58
C298:C5 A9 FF 85 9E A9 D7 85 94
C2A0:9F A2 19 A9 07 8D 70 C9 75
C2A8:20 55 C9 A9 00 85 FC A9 21
C2B0:04 85 FD 20 A8 C8 A9 C0 D7
C2B8:85 FC A9 07 85 FD 20 A8 F2
C2C0:C8 A9 28 85 FC A9 04 85 8E
C2C8:FD 20 B2 C8 A9 4F 85 FC CA
C2D0:A9 04 85 FD 20 B2 C8 AD C7
C2D8:B8 C5 D0 03 4C 3E C3 8D E6
C2E0:BB C5 A9 9E 20 D2 FF A9 CA
C2E8:00 8D 18 D4 A0 00 B9 A1 3C
C2F0:C8 99 0E D4 C8 C0 06 D0 76
C2F8:F5 38 AD 1B D4 E9 15 B0 18
C300:FC 69 17 AA 38 AD 1B D4 71
C308:E9 25 B0 FC 69 27 A8 8A 77
C310:38 E9 0B B0 09 98 38 E9 9F
C318:0B B0 03 4C F9 C2 8A 18 7E
C320:69 F2 90 09 98 18 69 E3 97
C328:90 03 4C F9 C2 18 20 F0 89
C330:FF A9 5F 20 D2 FF CE BB FF
C338:C5 F0 03 4C F9 C2 A9 CE 01
C340:85 FB A9 04 85 FC A9 19 8B
C348:85 FD A9 07 85 FE 20 CB EB
C350:C8 AD 00 DC 20 D4 C8 E0 3C
C358:05 F0 03 8E B1 C5 A9 1F FE
C360:A0 00 91 FB 18 A5 FB 69 E2
C368:00 85 9E A5 FC 69 D4 85 3C
C370:9F A9 07 A0 00 91 9E A9 4A
C378:FB 85 9E A9 00 85 9F AD D0
C380:B1 C5 20 F5 C8 A0 00 B1 30
C388:FB C9 20 F0 05 A9 01 8D F1
C390:BC C5 8A A0 00 91 FB 18 99
C398:A5 FB 69 00 85 9E A5 FC 0E
C3A0:69 D4 85 9F AD B5 C5 A0 2D
C3A8:00 91 9E AD 01 DC 20 D4 D3
C3B0:C8 E0 05 F0 03 8E B2 C5 02
C3B8:A9 1F A0 00 91 FD 18 A5 4B
C3C0:FD 69 00 85 9E A5 FE 69 EC
C3C8:D4 85 9F A9 07 A0 00 91 F6
C3D0:9E A9 FD 85 9E A9 00 85 4B
C3D8:9F AD B2 C5 20 F5 C8 A0 59
C3E0:00 B1 FD C9 20 F0 08 AD B3
C3E8:BC C5 09 02 8D BC C5 8A F6
C3F0:A0 00 91 FD 18 A5 FD 69 97
C3F8:00 85 9E A5 FE 69 D4 85 DC
C400:9F AD B6 C5 A0 00 91 9E BE
C408:AD BC C5 F0 03 4C 19 C4 9F
C410:AD B7 C5 20 D1 C9 4C 51 B8
C418:C3 AD BC C5 C9 03 D0 33 12
```

```
C420:18 A5 FB 69 00 85 9E A5 2E
C428:FC 69 D4 85 9F AD B5 C5 62
C430:A0 00 91 9E A9 56 91 FB EB
C438:18 A5 FD 69 00 85 9E A5 86
C440:FE 69 D4 85 9F AD B6 C5 7D
C448:A0 00 91 9E A9 56 91 FD 06
C450:4C 9F C4 C9 01 D0 23 18 C6
C458:A5 FB 69 00 85 9E A5 FC CF
C460:69 D4 85 9F AD B5 C5 A0 EE
C468:00 91 9E A9 56 91 FB AD 63
C470:B6 C5 8D 20 D0 EE B4 C5 EB
C478:A9 00 C9 02 D0 21 18 A5 11
C480:FD 69 00 85 9E A5 EE 69 AE
C488:D4 85 9F AD B6 C5 A0 00 BA
C490:91 9E A9 56 91 FD AD B5 BA
C498:C5 8D 20 D0 EE B3 C5 A9 F4
C4A0:40 20 D1 C9 AD B3 C5 CD BE
C4A8:B9 C5 D0 09 AD B5 C5 8D 88
C4B0:70 C9 4C 70 C5 AD B4 C5 89
C4B8:CD B9 C5 D0 09 AD B6 C5 8F
C4C0:8D 70 C9 4C 70 C5 A0 10 17
C4C8:A2 09 18 20 F0 FF 20 ED A0
C4D0:C9 A0 10 A2 0A 18 20 F0 75
C4D8:FF 20 ED C9 A9 99 20 D2 8B
C4E0:FF A0 10 A2 0B 18 20 F0 A8
C4E8:FF A9 20 20 D2 FF 20 D2 8C
C4F0:FF A9 5E 20 D2 FF A9 20 BC
C4F8:20 D2 FF AD B3 C5 20 71 88
C500:C9 8A 20 D2 FF 98 20 D2 B9
C508:FF A9 20 20 D2 FF 20 D2 AD
C510:FF A0 10 A2 0C 18 20 F0 E1
C518:FF A9 20 20 D2 FF 20 D2 BD
C520:FF A9 5E 20 D2 FF A9 20 ED
C528:20 D2 FF AD B4 C5 20 71 C1
C530:C9 8A 20 D2 FF 98 20 D2 E9
C538:FF A9 20 20 D2 FF 20 D2 DD
C540:FF A0 10 A2 0D 18 20 F0 1A
C548:FF 20 ED C9 A0 10 A2 0E CE
C550:18 20 F0 FF 20 ED C9 AD 08
C558:B5 C5 8D CA D9 AD B6 C5 47
C560:8D F2 D9 AD 00 DC 0D 01 14
C568:DC 29 10 D0 F6 4C 82 C2 6C
C570:A9 93 20 D2 FF A9 90 20 CE
C578:D2 FF AD 20 D0 8D 21 D0 F4
C580:A0 0F A2 0C 18 20 F0 FF 58
C588:A0 00 B9 98 C8 20 D2 FF 91
C590:C8 C0 09 D0 F5 AD 70 C9 EF
C598:CD B5 C5 D0 0A AD 00 DC 22
C5A0:29 10 D0 F9 4C 65 C0 AD A5
C5A8:01 DC 29 10 D0 F9 4C 65 7E
C5B0:C0 04 03 00 00 02 06 05 17
C5B8:00 01 40 00 00 00 3C 5A 5F
C5C0:7E 7E 3C 3C 00 00 3C 3C 0D
C5C8:3C 7E 7E 5A 3C 00 10 5D E6
C5D0:EF E3 FF 36 00 00 08 3A FA
C5D8:F7 C7 FF 36 00 71 27 21 EA
C5E0:02 AE 42 20 04 20 20 20 64
C5E8:20 20 20 20 20 20 1F 1F 71
C5F0:1F 1F 1F 20 20 20 1F 20 99
C5F8:20 20 20 1F 1F 1F 1F 20 66
C600:20 1F 20 20 1F 20 20 20 45
C608:20 20 20 20 20 20 20 20 95
C610:20 20 20 20 20 20 20 20 9D
C618:1F 20 20 20 20 1F 20 1F 20
C620:20 20 1F 20 20 20 20 1F 8C
C628:20 1F 20 1F 20 20 20 20 65
C630:20 20 20 20 20 20 20 20 BD
C638:20 20 20 20 20 20 20 20 C5
C640:1F 20 20 20 1F 20 20 20 45
C648:1F 20 1F 20 20 20 20 20 35
C650:20 1F 1F 20 20 20 20 20 7D
C658:20 20 20 20 20 20 20 20 E5
C660:20 20 20 20 20 20 20 20 ED
C668:1F 20 20 20 1F 1F 1F 1F 66
C670:1F 20 1F 20 20 20 20 20 5D
C678:20 1F 1F 1F 20 20 20 20 95
C680:20 20 20 20 20 20 20 20 0E
C688:20 20 20 20 20 20 20 20 16
C690:1F 20 20 20 1F 20 20 20 95
C698:1F 20 1F 20 20 20 20 1F 84
C6A0:20 1F 20 1F 20 20 20 20 DD
C6A8:20 20 20 20 20 20 20 20 36
C6B0:20 20 20 20 20 20 20 20 3E
C6B8:1F 20 20 20 1F 20 20 20 BD
C6C0:1F 20 20 1F 1F 1F 1F 20 AF
C6C8:20 1F 20 20 1F 20 20 20 0E
C6D0:20 20 20 20 20 20 20 20 5E
C6D8:20 20 20 20 20 20 20 20 66
C6E0:20 20 20 20 20 20 20 20 6E
C6E8:20 20 20 20 20 20 20 20 76
C6F0:20 20 20 20 20 20 20 20 7E
C6F8:20 20 20 20 20 20 20 20 86
C700:20 20 20 1E 1E 1E 1E 1E 51
C708:20 1B 1E 1E 1E 20 20 1C E1
C710:20 20 20 1B 20 20 1D 1D 46
C718:1D 1D 20 20 1C 20 20 1E 43
C720:20 20 20 20 20 20 20 20 AF
C728:20 20 20 20 20 1B 20 20 A3
C730:20 1B 20 20 20 1C 20 1C 6A
C738:20 20 20 1B 20 1C 20 20 67
C740:20 20 1D 20 1C 20 1E 20 4B
C748:20 20 20 20 20 20 20 20 D7
C750:20 20 20 20 20 1B 20 20 CB
C758:20 1B 20 20 20 1C 20 1C 92
C760:20 20 20 1B 20 1C 20 20 8F
C768:20 20 20 20 1C 1E 20 20 CF
C770:20 20 20 20 20 20 20 20 FF
C778:20 20 20 20 20 1B 20 20 F3
C780:20 1B 1D 1D 1D 1C 20 1C 12
C788:20 20 20 1B 20 1C 20 20 B7
C790:20 20 20 20 1C 1E 1E 20 F3
C798:20 20 20 20 20 20 20 20 28
C7A0:20 20 20 20 20 1B 20 20 1C
C7A8:20 1B 20 20 1C 20 20 1C D2
C7B0:20 20 20 1B 20 1C 20 20 DF
C7B8:20 20 1D 20 1C 20 1E 20 C3
C7C0:20 20 20 20 20 20 20 20 50
C7C8:20 20 20 20 20 1B 20 20 44
C7D0:20 1B 20 20 20 1C 20 20 0F
C7D8:1E 1E 1E 20 20 20 1E 1E A0
C7E0:1E 1E 20 20 1C 20 20 1E CC
C7E8:20 20 20 20 20 53 50 45 CA
C7F0:45 44 20 3A 20 20 20 20 BD
C7F8:20 20 20 20 20 20 20 20 88
C800:20 28 46 31 29 4F 42 53 E5
C808:54 41 43 4C 45 53 20 3A 33
C810:20 20 20 20 20 20 20 20 A1
C818:20 20 20 20 20 28 46 33 29
C820:29 50 4C 41 59 45 52 20 9C
C828:31 20 43 4F 4C 4F 52 20 1C
C830:3A 20 5E 20 20 20 20 20 96
C838:20 20 20 20 20 20 28 4A 04
C840:31 29 50 4C 41 59 45 52 CF
C848:20 32 20 43 4F 4C 4F 52 4B
C850:20 3A 20 5E 20 20 20 20 4C
C858:20 20 20 20 20 20 20 28 F1
C860:4A 32 29 50 4C 41 59 20 08
C868:54 4F 20 3A 20 20 20 20 81
C870:20 20 20 20 20 20 20 20 02
C878:20 28 46 37 29 50 52 45 D4
C880:53 53 20 42 4F 54 48 20 35
C888:42 55 54 54 4F 4E 53 20 DA
C890:54 4F 20 53 54 41 52 54 F9
C898:47 41 4D 45 20 4F 56 45 4C
C8A0:52 64 19 00 00 81 09 81 31
C8A8:A0 28 A9 1F 88 91 FC D0 11
C8B0:FB 60 A0 00 A2 17 A9 1F 50
C8B8:91 FC A5 FC 18 69 28 85 13
C8C0:FC A5 FD 69 00 85 FD CA 6D
C8C8:D0 EC 60 A9 1F A0 00 91 B1
C8D0:FB 91 FD 60 A2 00 38 E8 F8
C8D8:6A 90 04 E0 05 D0 F8 60 10
C8E0:A0 00 A2 00 B1 FB C9 1F 47
C8E8:D0 02 A2 06 B1 FD C9 1F 50
C8F0:D0 02 A2 06 60 A8 18 69 5F
C8F8:1A AA 98 C9 01 D0 13 38 9B
C900:A0 00 B1 9E E9 28 91 9E B5
C908:C8 B1 9E E9 00 91 9E 4C A■
C910:54 C9 C9 02 D0 13 18 A0 3D
C918:0■ B1 9E 69 28 91 9E C8 10
C920:B1 9E 69 00 91 9E 4C 54 55
C928:C9 C9 03 D0 13 38 A0 00 3B
C930:B1 9E E9 01 91 9E C8 B1 DB
C938:9E E9 00 91 9E 4C 54 C9 47
C940:C9 04 D0 10 18 A0 00 B1 C9
C948:9E 69 01 91 9E C8 B1 9E D8
C950:69 00 91 9E 60 A0 28 AD 38
C958:7■ C9 91 9E 88 D0 FB 18 4A
C960:A5 9E 69 28 85 9E A5 9F AF
C968:6■ 00 85 9F CA D0 E6 60 23
C970:07 A2 30 38 E8 E9 0A B0 6D
C978:FB CA 69 3A A8 60 18 A2 27
C980:0F A0 13 20 F0 FF AD B7 C2
C988:C5 20 71 C9 8A 20 D2 FF 4C
C990:9■ 20 D2 FF 60 18 A2 11 8C
C998:A0 13 20 F0 FF AD B8 C5 42
C9A0:20 71 C9 8A 20 D2 FF 98 67
C9A8:20 D2 FF 60 AD B5 C5 8D 64
C9B0:0B DB 60 AD B6 C5 8D 33 C2
C9B8:D■ 60 18 A2 16 A0 13 20 F8
C9C0:F0 FF AD B9 C5 20 71 C9 79
C9C8:8A 20 D2 FF 98 20 D2 FF EE
C9D0:60 8D BB C5 A0 08 A2 00 36
C9D8:A5 C5 C9 06 D0 03 4C 65 DA
C9E0:C0 CA D0 F4 88 D0 F1 CE 2B
C9E8:BB C5 D0 E8 60 A2 07 A9 B9
C9F0:20 20 D2 FF CA D0 FA 60 E6
```

Scott Gifford is a GEOS fan who lives in Flushing, Michigan.

HAM ANTENNAS

By Clifford Hudson

Designing antennas can be a complex yet important part of receiving and transmitting radio frequency signals for ham radio operators and shortwave listeners. This article won't go into the theory of antenna design, but it will help hams and SWLs when it comes to constructing a variety of popular antenna types.

Entering the Program

Ham Antennas is a menu-driven program for six different antenna designs.

It is written entirely in BASIC. To help avoid typing errors, use The Automatic Proofreader; see "Typing Aids" elsewhere in this section.

Note that lines 3032 and 3034 contain more than 80 characters. To enter these lines, use the BASIC shorthand ?TAB instead of PRINTTAB and omit spaces following the line number. List the line, place your cursor anywhere on the line, and then press Return to get the correct Proofreader checksum. Be sure to save a copy of the program before exiting Proofreader.

A Few Terms

Before we get into the program itself, let's clarify a few abbreviations that are used in Ham Antennas.

REF = Reflector. The longest element on quads or Yagis.
DE = Driven Element. The element where coax is attached.
DR# = Directors 1–4. DR#1 is the element directly ahead of the driven element.
Z = Impedance. Refers to the impedance at the feed point.
RF = Radio Frequency. The power out of the final network.
FMHZ= Frequency in megahertz.

The Menu

When you load and run Ham Antennas, you'll be presented with the following menu. Press the number next to the type that you want to construct.

1. Quad
2. Yagi
3. Spacing
4. Dipole
5. Folded Dipole
6. Long Wire
   A. Number of 1/2 wavelengths in antenna.
   B. Length of 1/2 wave coax at design frequency.

After you select any antenna type, you'll be asked for the desired operating frequency (FMHZ). Enter the frequency in megahertz and press Return. Ham Antennas will take the calculations from there and print the results.

Antenna Tips

Here's a brief rundown of each antenna. For more detailed information, consult the *American Radio Relay League (ARRL) Antenna Handbook*. It is available through the ARRL at 225 Main Street, Newington, Connecticut 06111.

The driven element for a quad antenna can be used for loop calculations. The impedance (Z) of a loop is about 100 ohms, so you could use 75-ohm coax for feedline and have a transfer of 1.5 : 1—not bad. The antenna can be mounted either vertically or horizontally. Feed at the side is vertical polarization; feed at the bottom is horizontal. Use at least 13-gauge wire or larger to compensate for skin effect. Larger wire also broad-bands the antenna.

When designing quads or Yagis, use the Spacing selection for all your element spacing needs. The program handles only one input calculation at a time. Here are some figures to use as a reference.

From the reflector to the driven element (REF to DE), the spacing should be .15 to .25 wavelengths. From the driven element to the first director (DE to DR#1), correct spacing is .1 wavelengths. From the second director to the fourth director (DR#2 to DR#4), spacing should be .2 wavelengths, with .4 for every additional director. These values appear onscreen when you run the program. For reference purposes, Ham Antennas uses 984 times the wavelength divided by the frequency.

The dipole is the easiest and most simple antenna to build. Using 468 divided by the frequency gives us a half wavelength. Cut that figure in half and attach coax; now jump to selection 6 (use the B section) to figure the half-wave of coax feedline for your dipole. Use even numbers of half-wavelengths to connect to your radio. It's convenient to insert coils on each side and make a dipole a dual-bander. I recommend Gazette's CoilCalc (June 1991) as an excellent program for making coils. I've used it to extend my 75-meter loop for the 160-meter band.

Folded dipoles are full-wavelength antennas. These are monoband antennas only, usually cut from 300-ohm television lead or 75- or 50-ohm coax for impedance matching.

For the long wire antenna selection, two inputs are required. The first is the odd half-waves followed by the frequency. Enter them and press Return. Ham Antennas will also give you the half-wavelengths in phase at the design frequency.

In closing, keep in mind that what looks good on paper isn't always what works exactly best in the real world. Ham Antennas calculations will be close, but you should then fine-tune your actual lengths with a standing wave ratio bridge. Have fun and 73 (best regards).

HAM ANTENNAS

```
ME 0 REM COPYRIGHT 1992 COMPUT
     E PUBLICATIONSINTL LTD -
     {SPACE}ALL RIGHTS RESERVE
     D
BB 1 GOSUB2075:GOTO900
MM 2 PRINT"{CLR}":GOSUB2070:GO
     SUB4091
JQ 3 PRINTTAB(14)"{3 DOWN}<<-Q
     UAD->>"
GG 4 PRINT:PRINT:PRINT:PRINT:P
     RINT:PRINT
RB 10 INPUT"{RVS}{6}CENTER FRE
     Q. DE";F
DA 20 W=1005/F
QH 25 PRINT"{DOWN}ONE WAVELENG
     TH DE":GOSUB4092
AS 30 X=W/4
ED 40 GOSUB4094:GOSUB4093
XF 45 GOSUB4095:GOSUB4096
AK 75 INPUT"{2 DOWN}CENTER FRE
     Q. REF.";F
KH 85 W=1035/F
QS 90 PRINT"{DOWN}ONE WAVELENG
     TH REF.":GOSUB4092
AA 100 X=W/4
DJ 110 GOSUB4094:GOSUB4093
JC 120 GOSUB4095:GOSUB4096
XJ 200 INPUT"{4 DOWN}CENTER FR
     EQ. DR#1";F
SH 210 W=995/F
XJ 215 PRINT"{DOWN}ONE WAVELEN
     GTH DR#1":GOSUB4092
XJ 220 X=W/4
FA 230 GOSUB4094:GOSUB4093
PM 240 GOSUB4095:GOSUB4096
GB 300 INPUT"{2 DOWN}CENTER FR
     EQ.DR#2";F
XR 310 W=895/F
KA 315 PRINT"{DOWN}ONE WAVELEN
     GTH DR#2":GOSUB4092
CS 320 X=W/4
AM 330 GOSUB4094:GOSUB4093
GQ 340 GOSUB4095:GOSUB4096
AB 364 INPUT:PRINT"{CLR}"
GR 380 GOSUB4098:PRINT"
     {5 DOWN}CHOOSE 1,2"
DQ 381 GETA$:IFA$=""THEN381
FM 382 Q=VAL(A$):IFQ<1ORQ>2THE
     N381
XH 383 ONQGOTO2,900
AF 386 IFQ=2THEN ONVGOTO900
XC 600 REM ELM SPACING
```

```
PH 601 PRINT"{CLR}":PRINTTAB(1
       1)"{DOWN}<- ANT. ELM SP
       ACING ->"
QB 602 PRINT "{DOWN}1.YAGI REF
        TO DE USE .15 OR .25":
       PRINT "{DOWN}2.DE-DR#1
       {SPACE}USE .1"
AP 603 PRINT "{DOWN}3.DR'S 2,3
       ,4, USE .2":PRINT "
       {DOWN}4.EA ADD DR'S, US
       E .4"
HQ 604 PRINT "{DOWN}5.EA ADD D
       R'S 1% LESS THAN PRECEE
       DING DIRECTOR"
SG 610 INPUT"{3 DOWN}CHOICE OF
        SPACING";A
RB 620 INPUT"{DOWN}DESIGN FREQ
        MHZ.=";F
HH 630 K=984
KJ 640 W=(K/F)*A
SX 650 PRINT W"FEET":PRINT W*1
       2"INCHES"
MR 655 FORT=1TO1000:NEXT
JG 660 GOSUB4097
MF 665 INPUT
AJ 670 GOSUB 4098
AM 675 GOSUB4099
HK 680 GETA$:IFA$=""THEN680
QA 685 X=VAL(A$)
GA 690 ONXGOTO600,900
JQ 700 GOSUB 2010
AJ 705 PRINT"{CLR}":GOSUB04091
DP 710 PRINTTAB(11)"{1}
       {3 DOWN}<- YAGI ELEMENT
       S ->"
EJ 715 INPUT"{3 DOWN}CENTER FR
       EQ REF:";F
XA 720 W=510/F
BQ 725 PRINT"{2 DOWN}LENGTH OF
        REF ELM:":PRINTW"FEET"
       :PRINTW*12"INCHES"
GD 730 PRINT"{2 DOWN}FROM CENT
       ER OF BOOM:":PRINTW"FEE
       T":PRINTW*12/2"INCHES"
SP 735 X=W
AA 740 INPUT"{3 DOWN}CENTER FR
       EQ DE:";F
HG 745 W=473/F
DP 750 PRINT"{2 DOWN}LENGTH OF
        DE:":PRINTW"FEET":PRIN
       TW*12"INCHES"
AD 752 PRINT"{2 DOWN}FROM CENT
       ER OF BOOM:":PRINTW/2"F
       EET":PRINTW*12/2"INCHES
       "
GQ 755 X=W
PQ 765 INPUT"{3 DOWN}CENTER FR
       EQ DR#1:";F
QH 770 W=445/F
HH 771 PRINT"{DOWN}LENGTH OF D
       R#1:":PRINTW"FEET":PRIN
       TW*12"INCHES"
KK 772 PRINT"{DOWN}FROM CENTER
        OF BOOM:":PRINTW"FEET"
       :PRINTW*12/2"INCHES"
PS 774 GOSUB4097
FQ 775 INPUT
BH 777 GOSUB4098:GOSUB4099
QA 780 GETA$:IFA$=""THEN780
KG 785 X=VAL(A$)
GP 790 ONXGOTO700,900
AQ 800 GOSUB2015:PRINT"{CLR}":
       GOSUB4091
QB 820 PRINTTAB(13)"{3 DOWN}<-
        DIPOLE ->"
AK 824 INPUT"{5 DOWN}CENTER FR
       EQ MHZ:";F
KR 825 W=468/F
HH 830 PRINT"{DOWN}ONE HALF WA
       VE DIPOLE:":GOSUB4092
FA 835 PRINT"{DOWN}1/4 WAVE EA
        SIDE:":PRINTW/2"FEET":
       PRINTW*12"INCHES"
HS 840 X=W/2
GX 845 GOSUB4097:INPUT:PRINT"
       {CLR}"
CD 860 GOSUB4098:GOSUB4099
MG 875 GETA$:IFA$=""THEN875
MR 880 X=VAL(A$)
XC 885 ONXGOTO800,900
HQ 900 GOSUB 2050
SB 905 PRINT"{CLR}":PRINTTAB(1
       2)"{BLK}{DOWN}< MAIN ME
       NU > ":PRINTTAB(10)"
       {DOWN} ANTENNA BUILDER
       {2 SPACES}"
CK 910 PRINTTAB(11)"{DOWN}PROG
       RAM CHOICES":PRINTTAB(5
       )"{8}{DOWN}1.QUAD":PRIN
       TTAB(5)"2.YAGI"
HP 915 PRINTTAB(5)"3.SPACING":
       PRINTTAB(5)"4.DIPOLE":P
       RINTTAB(5)"5.FOLDED DIP
       OLE"
KP 917 PRINTTAB(5)"6.LONG WIRE
       "
GG 918 PRINTTAB(6)"A.# 1/2 WAV
       ES IN PHASE"
MJ 919 PRINTTAB(6)"B.LENGTH OF
        1/2 WAVE COAX"
BK 920 PRINTTAB(6)"{DOWN}USE #
       3 FOR ALL ANT"
FA 921 PRINTTAB(6)"SPACING CAL
       ULATIONS"
MH 925 PRINT"{3 DOWN}CHOOSE 1,
       2,3,4,5,6"
RF 926 GETA$:IFA$=""THEN926
DH 927 X=VAL(A$):IFX<1ORX>6THE
       N926
PQ 928 ONXGOTO2,700,600,800,30
       00,4000
BF 930 IFX=1 GOTO 2{3 SPACES}:
       REM QUAD
KC 935 IFX=2 GOTO 700 :REM YAG
       I
JR 940 IFX=3 GOTO 600 :REM SPA
       CING
RK 945 IFX=4 GOTO 800 :REM DIP
       OLE
JJ 950 IFX=5 GOTO 3000:REM FOL
       D DIPOLE
PB 955 IFX=6 GOTO 4000:REM LON
       G WIRE
HF 2010 POKE 53281,PEEK(53281)
        AND248 OR 233:PRINT"
        {BLK}":RETURN
SC 2015 POKE 53281,PEEK(53281)
        OR 7:PRINT"{BLK}":RETU
        RN
DB 2040 POKE 53281,PEEK(53281)
        AND 328 OR 233:PRINT"
        {WHT}":RETURN
FR 2050 POKE 53280,14:POKE5328
        1,14:PRINT"{CLR}{WHT}"
        :RETURN
FJ 2070 POKE53280,PEEK(53281)A
        ND248OR233:PRINT"{6}":
        RETURN
CF 2075 POKE 53281,PEEK(53281)
        AND402 OR 160:RETURN
SP 3000 GOSUB2040:GOSUB4091
XP 3005 PRINT"{CLR}":PRINTTAB(
        11)"{2 DOWN}<<<-WIRE A
        NTENNAS->>>"
GR 3006 PRINTTAB(9)"{3 DOWN}<-
        FOLDED DIPOLE ->"
MS 3009 INPUT"{5 DOWN}CENTER F
        REQ MHZ:";F
DP 3010 W=1005/F
HK 3015 PRINT"{DOWN}ONE WAVE L
        ENGTH OVER ALL":GOSUB4
        092
KK 3020 PRINT"{DOWN}1/4 WAVE E
        A SIDE:":PRINTW/2"FEET
        ":PRINTW/2*12"INCHES"
RG 3021 X=W/2
FX 3024 GOSUB 4097
MP 3030 INPUT:PRINT"{CLR}"
FD 3032 PRINTTAB(2)"{DOWN}1.WI
        RE ANT WORK WELL AT 30
        FT. BEST AT{4 SPACES}
        THEIR RESONANT FREQ.
PK 3033 PRINTTAB(4)"1/2 WAVE A
        BOVE GROUND."
PQ 3034 PRINTTAB(2)"{DOWN}2. M
        ULTIBAND ANT'S 1/2 WAV
        E AT LOWEST{4 SPACES}F
        REQ. OPEN WIRE FEED"
GR 3036 GOSUB4097:INPUT:PRINT"
        {CLR}"
EQ 3040 GOSUB4098:GOSUB4099
SA 3055 GETA$:IFA$=""THEN3055
RB 3060 X=VAL(A$)
FA 3065 ONXGOTO3000,900
RG 4000 GOSUB 2075:GOSUB4091
DH 4005 V=2:PRINT"{CLR}":PRINT
        TAB(10)"{DOWN} - WIRE
        {SPACE}ANTENNAS -"
EE 4006 PRINTTAB(11)"{DOWN}
        {3 SPACES}- LONG WIRE
        {SPACE}-{3 SPACES}"
QA 4007 PRINTTAB(7)"{DOWN}
        {2 SPACES}- HARMONIC A
        NTENNAS -{2 SPACES}"
HG 4010 PRINT "{DOWN}1.CUT WIR
        E ODD 1/2 WAVES AT LOW
        EST{8 SPACES}FREQ YOU
        {SPACE}WILL WORK"
EC 4013 PRINT "{DOWN}2.HAVE GO
        OD EARTH GND AND A 4:1
        BALUM{5 SPACES}IN TUN
        ER"
KS 4015 PRINT "{DOWN}3.ELECTRI
        AL LENGTH OF HARMONIC
```

```
         {SPACE}ANTENNAS"
EK 4020  PRINT"{DOWN}1/2 WAVELE
         NGTH COAX"
QD 4023  PRINT"{DOWN}1.ALL BAND
          INVERTED VEE'S.":PRIN
         T"{DOWN}2.LONG WIRES,
         {SPACE}HAVE VERY HI Z.
         "
JQ 4024  PRINT"{DOWN}WHERE Z IS
          IN REFERENCE TO IMPED
         ANCE"
GM 4025  PRINT"THE LOAD GIVES T
         O THE FEEDLINE AT A FR
         EQ"
PA 4027  GOSUB4097:INPUT:PRINT"
         {CLR}"
KP 4028  INPUT"{RVS}{CYN}
         {3 DOWN}NUMBER OF ODD
         {SPACE}1/2 WAVELENGTH=
         {2 SPACES}";N
PB 4029  INPUT"{RVS}{GRN}{DOWN}
         LOWEST FREQ IN MHZ.
         {2 SPACES}";F
XK 4030  K=492
GC 4035  W=(K/F)*N-.05
XQ 4037  PRINT"{RVS}{YEL}{DOWN}
         LENGTH OF LONG WIRE":G
         OSUB4092
KE 4045  PRINT"{RED}{RVS}{DOWN}
         FREQ IN MHZ. " F
MX 4047  K=984
QD 4048  L=W
PJ 4049  X=F*(L)+.025
AC 4050  PRINT"{RVS}{1}{DOWN}LE
         NGTH OF WIRE IN FEET"
         {SPACE}W
FX 4058  PRINTX/936"NUMBER OF W
         AVELENGTHS":PRINTX/468
         "NUMBER OF 1/2 WAVELEN
         GTHS"
BG 4059  INPUT"{RVS}{6}COAX VEL
         OCITY FACTOR"; V
EC 4060  PRINT"{DOWN}"492/F*V/1
         2"{10 LEFT}{DOWN}=1/2
         {SPACE}WAVE COAX AT DE
         SIGN FREQ IN FEET"
GC 4062  GOSUB4097:INPUT:PRINT"
         {CLR}"
ES 4065  GOSUB4098:GOSUB4099
MG 4080  GETA$:IFA$=""THEN4080
PG 4085  V=VAL(A$)
MH 4090  ONVGOTO4000,900:END
SE 4091  PRINT"{CLR}":RETURN
JE 4092  PRINTW"FEET":PRINTW*12
         " INCHES":RETURN
XR 4093  PRINT"{DOWN}1/4 WAVE E
         A SIDE":PRINT W/4"FEET
         ":PRINT W*12/4"INCHES"
         :RETURN
ES 4094  L=SQR((X*X)+(X*X)/X*X)
         :RETURN
DQ 4095  PRINT"{DOWN}TOTAL WIDT
         H ACROSS SPREADERS":PR
         INTL"FEET":PRINTL*12"I
         NCHES":RETURN
MF 4096  PRINT"{DOWN}DRILL HOLE
          FRM CNTR BOOM":PRINTL
         /2"FEET":PRINTL*12/2"I
         NCHES":RETURN
RF 4097  PRINT" {DOWN}{RVS} {6}
          PRESS RETURN ":RETURN
XA 4098  PRINT"{CLR}":PRINTTAB(
         8)"{DOWN}1.CALC AGAIN?
         ":PRINTTAB(8)"{DOWN}2.
         MAIN MENU":RETURN
FX 4099  PRINT"{4 DOWN}CHOOSE 1
          OR 2":RETURN
KK 5010  END
```

Clifford Hudson, KG6PD, is a ham radio operator in Hesperia, California.

BATTLESHIP 128

By Donald G. Klich

Probably every schoolchild has played the game Battleship using grids drawn on a piece of paper. The object of the game is to place four ships secretly on your grid while your opponent does the same. Then by alternately calling out salvos of three grid locations, you try to sink your opponent's navy.

Problems with the paper version can occur when an opponent sneaks a look at the other's grid. Another problem comes when an opponent scores a hit and the other person winces, unintentionally giving away a ship's location. Battleship 128 is a computerized version for the 128 that updates the old pencil-and-paper favorite.

Typing It In

Battleship 128 is written entirely in BASIC 7.0. To help avoid typing errors, enter the program with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. REM instructions starting with line 180 are included for those readers who enjoy program analysis. These remarks can be omitted if desired.

Battleship 128 remembers where the players locate their ships and produces separate screens depicting each player's progress. When a hit is scored, the program doesn't reveal exactly where it occurred, but displays the entire salvo as possible hits. This makes the game more interesting. When a ship is sunk, it is identified and displayed in red.

Some simple sounds and colors have been added to make the computer version more appealing. As an aid to your gunnery, listen carefully to the sounds of your hits and use them with some basic reasoning to gain a slight advantage over your opponent.

BATTLESHIP 128

```
FK 10  REM COPYRIGHT 1992 - COM
       PUT PUBLICATIONS INTL LT
       D - ALL RIGHTS RESERVED
AQ 20  REM BY DONALD G. KLICH
SP 30  GRAPHIC0,1:PRINTSPC(12)"
       {5 DOWN}SETTING UP"
BS 40  DIM B1(2,2),B2(2,2,2),B3
       (2,3,2),B4(2,4,2),S$(2,4
       5,2),SH(3),G(2,4),T(45,4
       ):ENVELOPE9,0,4,4,10,3:V
       OL9
QS 50  FORI=1TO2:FORJ=1TO45:S$(
       I,J,1)=" ":S$(I,J,2)=" "
       :NEXT:NEXT
PA 60  FORI=0TO4:FORJ=1TO9:T(I*
       9+J,1)=1+4*J:T(I*9+J,2)=
       4*I+4:T(I*9+J,3)=6+16*J:
       T(I*9+J,4)=32*I+36:NEXT:
       NEXT
DP 70  GRAPHIC0,1:PLAY"V1O2T0HC
       QEG.AIEQARO3HCQDO2GO3HCR
       ":VOL0:VOL10:FORP=1TO2
KS 80  GRAPHIC0,1:COLOR0,1:COLO
       R1,2:COLOR2,4:COLOR3,3:C
       OLOR4,1
CA 90  PRINT"{DOWN}{GRN}
       {13 SPACES}BATTLESHIP 12
       8{2 DOWN}"
FK 100 PRINT"{WHT}PLAYER{YEL}"
       P"{WHT}ENTER YOUR BOAT
       {SPACE}POSITIONS.":PRIN
       T"{2 DOWN}EXAMPLES:":PR
       INTSPC(9)"BOAT 1 = D,4
       {5 SPACES}OR":PRINTSPC(
       9)"BOAT 3 = C,3,D,4,E,5
       "
MA 110 PRINT"{DOWN}USE RETURN
       {SPACE}AFTER ENTERING E
       ACH BOAT":PRINT"EVEN TH
       OUGH ENTRIES ARE BLANKE
       D OUT":PRINT"{DOWN}BOAT
       S ARE LENGTHS 1 TO 4 AN
       D CAN BE"
MX 120 PRINT"VERTICAL, HORIZON
       TAL, OR DIAGONAL":PRINT
       :PRINT"SHOTS ARE MADE S
       IMILAR TO BOAT3 ABOVE."
QC 130 PRINT"THOSE THAT ALL MI
       SS ARE SHOWN AS {RVS}WH
       ITE{OFF}":PRINT"IF ANY
       {SPACE}ARE HITS, ALL AR
       E SHOWN AS {RVS}{CYN}BL
       UE{OFF}{WHT}"
FR 140 PRINT"SUNK BOATS ARE SH
       OWN IN {RVS}{RED}RED
       {WHT}{OFF}"
RG 150 PRINT"{3 DOWN}
       {3 SPACES}HIT ANY KEY W
       HEN READY TO START"
XG 160 GETA$:IFA$=""THEN160
QS 170 GOSUB590
SF 180 REM LOAD BOAT LOCATIONS
        FOR EACH PLAYER
```

```
AK 190 INPUT"{WHT}ENTER LOCATI
       ON OF BOAT 1{BLK}";H$,V
       :GOSUB500:IFE=1THEN190:
       ELSEB1(P,1)=L
HJ 200 PRINTSPC(18)"{WHT}BOAT
       {SPACE}2{BLK}":INPUTH$,
       V,B$,B:GOSUB500:IFE=1TH
       EN200:ELSEB2(P,1,1)=L:H
       $=B$:V=B:GOSUB500:IFE=1
       THEN200:ELSEB2(P,2,1)=L
GC 210 PRINTSPC(18)"{WHT}BOAT
       {SPACE}3{BLK}":INPUTH$,
       V,B$,B,C$,C:GOSUB500:IF
       E=1THEN210:ELSEB3(P,1,1
       )=L:H$=B$:V=B
MP 220 GOSUB500:IFE=1THEN210:E
       LSEB3(P,2,1)=L:H$=C$:V=
       C:GOSUB500:IFE=1THEN210
       :ELSEB3(P,3,1)=L
HJ 230 PRINTSPC(18)"{WHT}BOAT
       {SPACE}4{BLK}":INPUTH$,
       V,B$,B,C$,C,D$,D:GOSUB5
       00:IFE=1THEN230:ELSE:B4
       (P,1,1)=L:H$=B$:V=B:GOS
       UB500
MF 240 IFE=1THEN230:ELSEB4(P,2
       ,1)=L:H$=C$:V=C:GOSUB50
       0:IFE=1THEN230:ELSEB4(P
       ,3,1)=L:H$=D$:V=D:GOSUB
       500:IFE=1THEN230
SM 250 B4(P,4,1)=L:NEXTP:P=1:Q
       =2:PRINT"{WHT}"
CP 260 REM ACCEPT 3 SHOTS AND
       {SPACE}STORE IN TEMP AR
       EA "SH(3)"
MQ 270 GOSUB590:GOSUB530:CHAR1
       ,14,0,CHR$(48+P)
FF 280 PRINT"PLAYER "+CHR$(48+
       P)+", TAKE 3 SHOTS";:IN
       PUTH$,V,B$,B,C$,C:GOSUB
       500:IFE=1THEN280:ELSESH
       (1)=L:H$=B$:V=B:GOSUB50
       0:IFE=1THEN280
RX 290 SH(2)=L:H$=C$:V=C:GOSUB
       500:IFE=1THEN280:ELSESH
       (3)=L
CC 300 REM CHECK BOATS FOR HIT
       S
SH 310 HT=0:FORI=1TO3:IFSH(I)=
       B1(Q,1)THENB1(Q,2)=1:HT
       =1:PLAY"T9G"
FB 320 NEXT:FORI=1TO3:FORJ=1TO
       2:IFSH(I)=B2(Q,J,1)THEN
       B2(Q,J,2)=1:HT=1:PLAY"T
       9G"
XF 330 NEXT:NEXT:FORI=1TO3:FOR
       J=1TO3:IFSH(I)=B3(Q,J,1
       )THENB3(Q,J,2)=1:HT=1:P
       LAY"T9G"
QQ 340 NEXT:NEXT:FORI=1TO3:FOR
       J=1TO4:IFSH(I)=B4(Q,J,1
       )THENB4(Q,J,2)=1:HT=1:P
       LAY"T9G"
MS 350 REM CHANGE SHOTS TO POS
       SIBLE HIT COLOR IFA HIT
        RECORDED
MR 360 NEXT:NEXT:IFHT=1THENFOR
       I=1TO3:S$(P,SH(I),1)="2
       ":S$(P,SH(I),2)="?":NEX
       T
XB 370 IFHT=0THENFORI=1TO3:S$(
       P,SH(I),1)="1":S$(P,SH(
       I),2)="~":NEXT
KD 380 REM CHECK IF ANY BOAT C
       OMPLETELY SUNK, TURN BO
       AT SQUARES RED
AJ 390 IFB1(Q,2)=1THENS$(P,B1(
       Q,1),1)="3":S$(P,B1(Q,1
       ),2)="1":G(Q,1)=1
MB 400 IFB2(Q,1,2)=1ANDB2(Q,2,
       2)=1THENFORI=1TO2:S$(P,
       B2(Q,I,1),1)="3":S$(P,B
       2(Q,I,1),2)="2":NEXT:G(
       Q,2)=1
DG 410 IFB3(Q,1,2)=1ANDB3(Q,2,
       2)=1ANDB3(Q,3,2)=1THENF
       ORI=1TO3:S$(P,B3(Q,I,1)
       ,1)="3":S$(P,B3(Q,I,1),
       2)="3":NEXT:G(Q,3)=1
CE 420 IFB4(Q,1,2)=1ANDB4(Q,2,
       2)=1ANDB4(Q,3,2)=1ANDB4
       (Q,4,2)=1THENFORI=1TO4:
       S$(P,B4(Q,I,1),1)="3":S
       $(P,B4(Q,I,1),2)="4":NE
       XT:G(Q,4)=1
GJ 430 REM CHECK IF ALL BOATS
       {SPACE}SUNK
HP 440 GOSUB530:IFG(Q,1)+G(Q,2
       )+G(Q,3)+G(Q,4)<>4THEN4
       60
KX 450 PLAY"V1O3T8ICCCDCQDWE":
       PRINT"PLAYER "+CHR$(48+
       P)+" HAS WON THE WAR!..
       ..AGAIN?":GETKEYA$:IFA$
       ="Y"THENRUN:ELSEEND
MQ 460 PRINT"{6 SPACES}PRESS A
       NY KEY TO CONTINUE"
SX 470 GETA$:IFA$=""THEN470
FQ 480 IFP=1THENP=2:Q=1:GOTO27
       0:ELSEP=1:Q=2:GOTO270
AJ 490 REM CONVERT HOR AND VER
       T TO SQUARE #
QQ 500 E=0:IFH$>"I"ORH$<"A"ORV
       <1ORV>5THENE=1:SOUND1,4
       000,10:RETURN
KG 510 L=((V-1)*9)+ASC(H$)-64:
       RETURN
JC 520 REM PRINT GAME RECORD I
       N GRID
DC 530 FORI=1TO45
DD 540 IFS$(P,I,1)=" "THEN570
KF 550 CHAR1,T(I,1),T(I,2),S$(
       P,I,2)
DF 560 CIRCLEVAL(S$(P,I,1)),T(
       I,3),T(I,4),5,,,,,90
FS 570 NEXT:RETURN
FH 580 REM DRAW GRID
MD 590 GRAPHIC4,1,23:FORI=0TO8
       :CHAR1,5+(I*4),1,CHR$(6
       5+I):NEXT:BOX1,14,20,15
       8,180:FORI=0TO4:CHAR1,1
       ,4+(I*4),CHR$(49+I):NEX
       T
HG 600 FORI=52TO148STEP32:DRAW
       1,14,ITO158,I:NEXT:FORI
       =30TO142STEP16:DRAW1,I,
       20TOI,180:NEXT:CHAR1,6,
       0,"PLAYER #"+CHR$(48+P)
       +"'S SCREEN":RETURN
```

Donald G. Klich, the author of Railroad Solitaire (Gazette Disk bonus, July 1992) lives in Mt. Prospect, Illinois.

SPEEDRAM-64

By Frank Gordon

Wouldn't it be convenient if you could use SpeedScript with the 1764 RAM expansion unit (REU) or two drives? Well, you can with Speedram-64.

This BASIC utility converts COMPUTE's word processor into Speedram-64, allowing you to change the drive number from within the program to either 8 or 9. You can also customize the program to run SpeedScript with your favorite background and text colors already loaded.

Typing It In

To help avoid typing errors, enter the BASIC loader with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Numerous REM statements help explain the program, but they may be omitted if you prefer. Be sure to save a copy of the converter (Speedram.cvt) before you exit Proofreader.

Creating Speedram-64

In order to modify your version of SpeedScript, follow these steps.

1. Load and run SpeedScript.
2. Select your favorite background and text colors with Ctrl+B and Ctrl+L.
3. Exit SpeedScript by tapping the Restore key and responding to the prompt by pressing Y.
4. Type POKE44,40: POKE10240,0: NEW and press Return. This will protect SpeedScript's BASIC area.
5. Load but don't run Speedram.cvt with a ,8 extension.
6. Insert a work disk onto which you want to store Speedram-64. Enter *RUN* and press Return.

The converter will run and save the modified version of SpeedScript to disk with the filename Speedram-64. When the utility finishes saving the program, turn your computer off and then back on before using Speedram.

Using Speedram-64

If you have a 1764 REU, install it and initialize it as drive 9. At this point you may also wish to copy any SpeedScript programs to the 1764. If not, return to the 1764 menu and quit. Now load and run Speedram-64 like any BASIC program. Your familiar SpeedScript screen should appear in the colors that you selected.

You can test Speedram-64 by pressing Ctrl+N (for drive 9) and then Ctrl+4 for a directory. You should get a rapid listing of any files stored in the REU (or on drive 9, if you have two drives). Press Ctrl+Y (for drive 8), and Ctrl+4 will list programs from that drive. Also, when you press Ctrl+N or Ctrl+Y, the drive number appears on the command line. Shift from one drive to the other in this rapid manner to load or save SpeedScript files.

How Speedram-64 Works

You may be interested in knowing how Speedram-64 works. I used the list of pokes that change the drive number in "Modifying SpeedScript" (July 1992) and followed Jonathan Bell's machine language notes in his Word Count program on COMPUTE's SpeedScript disk.

Bell describes how to create new SpeedScript utilities that rely on unimplemented Ctrl+*key* combinations. POKE2854,114: POKE 2855,36 will shift control to 9330 ($2472) for unused Ctrl+*key* combinations, and here the ASCII value of the accumulator can be compared to the new Ctrl+*key*.

For example, 14 and 25 in line 60 are the ASCII values of Ctrl+N and Ctrl+Y. You can replace these with your own Ctrl+*key* combinations if these are not used by SpeedScript.

It is important that any section of a new routine end with JMP 2665 ($0A69) to return control to SpeedScript. To keep the drive number on the command line, however, I inserted another wedge from 2665 to 2670 (JMP 9395:NOP:NOP) into SpeedScript's main loop and ended each new section with a JMP back to 2670 ($0A6E).

SPEEDRAM.CVT

```
EQ 10 REM COPYRIGHT 1992 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
BS 15 FOR I=9330 TO 9411:READA
      :POKEI,A:B=B+A:NEXTI
PA 20 IFB<>7836 THEN PRINT"ERR
      OR IN DATA STATEMENTS":S
      TOP
DQ 25 REM - INSERT JMP 9330 ($
      2472) -
AK 30 POKE2854,114:POKE2855,36
      :POKE9070,0
BX 35 REM - INSERT WEDGE AT 26
      65-2670 ($0A69-$0A6E) -
CE 40 POKE2665,76:POKE2666,179
      :POKE2667,36:POKE2668,23
      4:POKE2669,234
AJ 45 REM - RETURN TO BASIC AR
      EA AND SAVE MODIFIED SPE
      EDCRIPT -
AS 50 POKE43,1:POKE44,8:POKE45
      ,196:POKE46,36:SAVE"SPEE
      DRAM-64",8
CP 55 REM - COMPARE ACC TO CTR
      L-KEY VALUES AND BRANCH
      {SPACE}TO EIGHT OR NINE
EF 60 DATA 201,25,240,7,201,14
      ,240,16
AQ 65 REM - IF NO MATCH JUMP T
      O WEDGE
DP 70 DATA 76,187,36
RR 75 REM - IF EIGHT, LDA #8 A
      ND JSR TO STORE, PRINT 8
       THEN JUMP TO WEDGE -
QC 80 DATA 169,8,32,151,36,169
      ,56
DR 85 DATA 141,39,4,76,187,36
AF 90 REM - IF NINE, LDA #9 AN
      D JSR TO STORE, PRINT 9
      {SPACE}THEN JUMP TO WEDG
      E -
MS 95 DATA 169,9,32,151,36,169
EF 100 DATA 57,141,39,4,76,187
       ,36
EG 105 REM - STORE VALUES OF E
       IGHT OR NINE -
JB 110 DATA 141,235,18,141,44
GM 115 DATA 19,141,154,20,141,
       241
CP 120 DATA 22,141,79,23,141,2
       23
JC 125 DATA 24,141,227,26,141,
       91
CG 130 DATA 27,141,161,27,96
FK 135 REM - GET LAST DEVICE A
       ND PUT ON COMMAND LINE
       {SPACE}-
PE 140 DATA 165,186,24,105,48,
       141,39,4
EH 145 REM - WEDGE, INSERT COM
       MANDS REPLACED AT 2665-
       2670 AND RETURN TO 2670
       -
FC 150 DATA 160,0,140,113,36
PJ 155 DATA 76,110,10,0
```

Frank Gordon is the author of Graphos (April 1992). He used MetaBASIC to help develop Speedram-64, and he lives in Orono, Maine. ❐

ONLY ON DISK

Here are the bonus programs that you'll find on this month's Gazette Disk.

Lodraw
By Robert Quinn
Wagga Wagga, NSW
Australia

Lodraw is a full-featured low-resolution drawing and painting program that uses all of the 64's alphanumeric and graphic keyboard characters. Much more.

SpeedCalc Help
By Randy Clemmons
San Diego, CA

Have you ever run SpeedCalc, Gazette's spreadsheet, only to realize that you've forgotten several of its important commands? SpeedCalc Help displays those commands on the spreadsheet screen.

The December Gazette Disk is only $9.95 plus $2.00 shipping and handling. Order it by writing to Gazette Disk, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

TYPING AIDS

MLX, our machine language entry program for the 64 and 128, and *The Automatic Proofreader* are utilities that help you type in Gazette programs without making mistakes. To make room for more programs, we no longer include these labor-saving utilities in every issue, but they can be found on each *Gazette Disk* and are printed in all issues of *Gazette* through June 1990.

If you don't have access to a back issue or to one of our disks, write to us, and we'll send you printed copies of both of these handy programs. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope. Send a self-addressed, stamped disk mailer to receive these programs on disk.

Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.