RAMLink Manual Addendum

!!! IMPORTANT !!!
PLEASE READ BEFORE
INSTALLING RAMLINK

What this Addendum Contains

This addendum contains information concerning changes in the RAMLink manual, as well as additional information on installing and using RAMLink. The following is a list of contents:

Power and Battery Connector Changes

Please note that due to design changes in RAMLink, the Power and Battery connectors have been changed. Therefore the following diagrams in the manual are incorrect: Figure 2-9 on page 2-12, Figures H-1 and H-2 in Appendix H, and Figure I-1 in Appendix I.

RAMLink's new Power connector is now the same as the old RAMLink Battery connector (shown in Figure I-1), and accepts a 1 Amp 9 volt DC wall-mount power supply. Polarity is positive (+) tip.

RAMLink's new Battery connector is a 3/8" miniature phone jack. Polarity is positive (+) tip.

Additional Installation Instructions for Commodore 128 Computers

About Jumper Clip Installation

Contrary to the information given in the manual, we have discovered that some 128 computers may require installation of the Timing Jumper Clip Assembly for proper operation with RAMLink. This requirement is rare, so you should try to use RAMLink without installing the clip assembly first.

If you experience any of the following symptoms on your 128 with a RAMLink attached and enabled, try installing the clip assembly according to the instructions for your particular model of 128:

- Computer fails to operate in any mode
- Programs break to monitor or lock-up
- Memory in the computer or RAMLink gets corrupted
- Odd characters appear on the screen or cursor behaves abnormally

Before performing any of the Timing Clip installations given, read the warnings given in 'C64 Timing Jumper Clip Installation', located in Section 2 of the RAMLink manual (page 2-4). You will also find a list of required tools in that section.

C128 Installation

These instructions apply to the standard ('flat') C128 model. This model was made of plastic and did not have a built-in disk drive. Please follow the steps carefully to avoid mistakes which might damage your computer.

1. Make sure that the C128 power switch is OFF and that any peripherals attached to the C128 are also switched OFF.

2. Unplug the C128 AC power cord from the AC power receptacle.

3. Unplug ALL cables from the C128.

4. Remove all devices plugged into the User and Cartridge ports.

5. Turn the C128 upside-down and remove the six screws which hold the top and bottom halves of the computer together.

6. Turn the C128 back over into its normal position. Separate the upper and lower case assemblies at the seam along the left side of the computer. Lift the left side of the keyboard assembly until it is tilted upward far enough for you to gain access to the inside of the computer.

7. Unplug the indicator light cable from the left side of the circuit board.

8. Unplug the keyboard cable from the C128 circuit board and unfasten the keyboard ground strap. Place the keyboard off to one side. Note: the keyboard connection may be a snug fit. If so, work it off carefully by alternately lifting each end of the connector slightly.

9. Remove the screws securing the metal shield that covers the circuit board. Untwist the metal tabs located around the perimeter of the shield and then remove the shield. Note: the shield may be soldered at a point along the right side of the circuit board. If so, you can: (a) desolder the shield using a soldering iron, (b) break the solder joint by twisting the shield (no need to solder it back on later) or (c) leave the shield soldered and bend it out of the way off to your right.

10. Locate the PLA chip which is the integrated circuit labeled U11. Attach the clip to pin 41 of this IC as shown in Figure 1.

11. Carefully feed the other end of the clip assembly (the end with the small connector on it) through the opening in the upper right corner of the metal shield located over the Cartridge port. If you wish, you may secure the clip assembly wire to the circuit board somewhere near the clip with a piece of electrical tape.

12. Replace the metal shield assembly, and twist the metal tabs used to hold it in place.

13. Replace the keyboard grounding strap and reconnect the keyboard cable to the circuit board.

14. Tilt the keyboard assembly back towards its normal position on top of the lower case assembly.

15. Reconnect the power-on indicator lamp cable to its connector on the C128 circuit board. Note: Cable orientation is not critical.

16. Fit the upper keyboard assembly into place on top of the lower case assembly. Turn the C128 upside down and replace the six screws which hold the upper and lower halves of the case together.

17. Proceed with the section titled, 'Attaching RAMLink to you Computer' found in Section 2 (page 2-9) of the RAMLink manual. Make sure that you also perform the steps given in the part of that section titled, 'RAMLink Clip Connector Installation Procedure'.
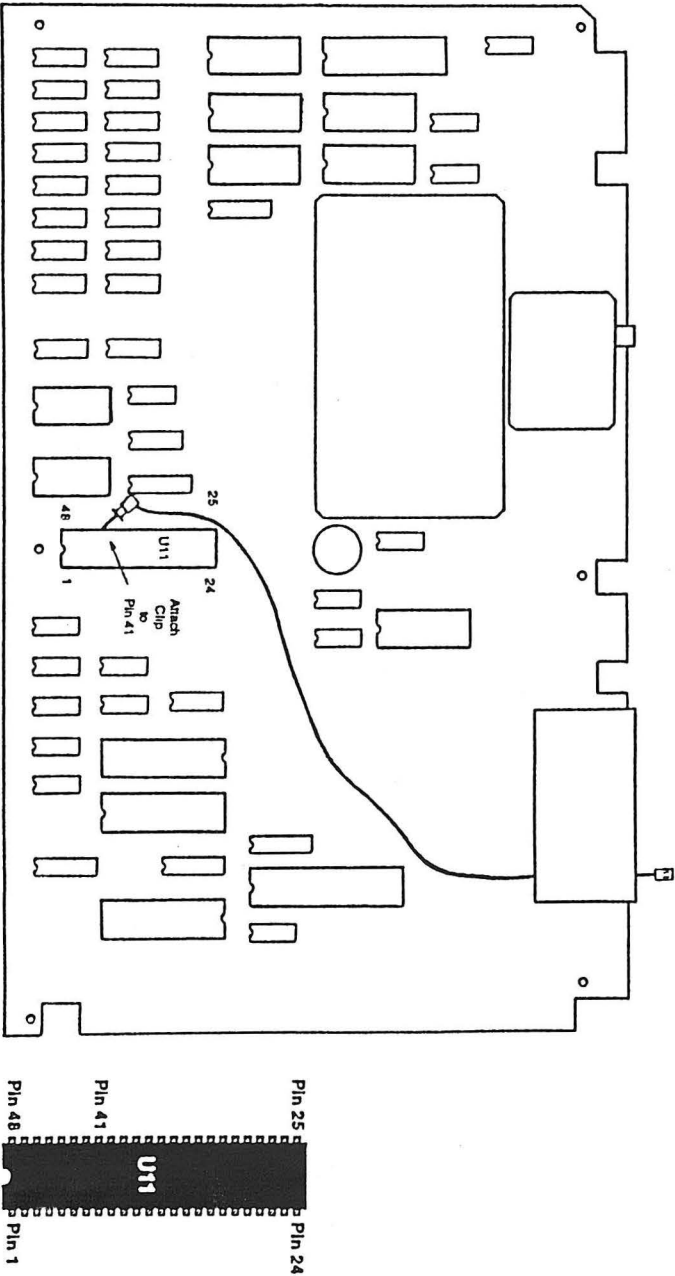
Figure 1

C128-D portable (plastic case) Installation

These instructions apply to the plastic-cased C128-D portable model. This model was common throughout Europe and Australia, and featured a built-in disk drive and carrying handle. Please follow the steps carefully to avoid mistakes which might damage your computer.

1. Make sure that the C128-D is switched OFF and that any peripherals attached to the C128-D are also switched OFF.

2. Unplug the C128-D AC power cord from the AC power receptacle.

3. Unplug ALL cables from the C128-D and remove any devices plugged into the User and Cartridge ports.

4. Turn the C128-D upside-down and remove 4 screws which hold the top on. Turn the C128-D back over into an upright position and remove the top cover.

5. Remove the drive lever arm from the front panel, then remove the 3 screws which hold the front panel in place. Disconnect the 2 front panel LED cables from the circuit boards and remove the front panel.

6. Remove the 4 screws holding the drive housing down to the chassis. Disconnect the drive power cable and the flat ribbon cable (serial bus) from the drive assembly (please note the orientation of these cables), then remove the drive assembly.

7. Remove the 4 screws holding the power supply assembly down (near front of case), then remove the power supply assembly and set it out of the way.

8. Remove the screws securing the metal shield that covers the circuit board. Untwist the metal tabs located around the perimeter of the shield and then remove the shield. Note: the shield may be soldered at a point along the right side of the circuit board. If so, you can: (a) desolder the shield using a soldering iron, (b) break the solder joint by twisting the shield (no need to solder it back on later) or (c) leave the shield soldered and bend it out of the way off to your right.

9. Locate the PLA chip which is the integrated circuit labeled U11. Attach the clip to pin 41 of this IC as shown in Figure 1.

10. Carefully feed the other end of the clip assembly (the end with the small connector on it) through the opening in the upper right corner of the metal shield located over the Cartridge port. If you wish, you may secure the clip assembly wire to the circuit board somewhere near the clip with a piece of electrical tape.

11. Replace the metal shield assembly, and twist the metal tabs used to hold it in place.

12. Replace the power supply assembly and the 4 screws which hold it into place.

13. Replace the drive assembly and attach the flat ribbon cable (serial bus) and the drive power cable (make sure these are properly oriented). Replace the 4 screws which hold the drive housing down to the chassis.

14. Replace the front panel and attach the two front panel LED cables to the proper locations on the main board and drive controller board (orientation is not critical). Replace the 3 screws which hold the front panel in place, then replace the drive lever arm.

15. Replace the top cover, then turn the C128-D upside-down and replace the 4 screws which hold the top on. Turn the C128-D back over into an upright position.

16. Proceed with the section titled, 'Attaching RAMLink to you Computer' found in Section 2 (page 2-9) of the RAMLink manual. Make sure that you also perform the steps given in the part of that section titled, 'RAMLink Clip Connector Installation Procedure'.

C128-D (metal case) Installation

These instructions apply to the metal-cased C128-D model. This model was common throughout North America and featured a built-in disk drive. Please follow the steps carefully to avoid mistakes which might damage your computer.

1. Make sure that the C128-D is switched OFF and that any peripherals attached to the C128-D are also switched OFF.

2. Unplug the C128-D AC power cord from the AC power receptacle.

3. Unplug ALL cables from the C128-D and remove any devices plugged into the User and Cartridge ports.

4. Turn the C128-D upside-down and remove the two top cover screws located on the edge of the case near the front corners.

5. Turn the C128-D back over into an upright position and remove the three screws on the back, on the left top and right outside edges where the top cover folds over onto the back of the case.

6. Slide the top cover of the C128-D back about 1 inch towards the rear of the computer, then remove the top cover by lifting it straight up.

7. Locate the PLA chip which is the integrated circuit labeled U11. Attach the clip to pin 41 of this IC as shown in Figure 2.

8. Carefully feed the other end of the clip assembly (the end with the small connector on it) through the opening in the upper right corner of the metal shield located over the Cartridge port. If you wish, you may secure the clip assembly wire to the circuit board somewhere near the clip with a piece of electrical tape.

9. Replace the C128-D top cover. To do this, first lower the cover straight down with it positioned about 1 inch back from its assembled position, so that the tabs and holes on the cover and base assembly align. Next, slide the cover forward and into position. Replace the five mounting screws that secure the cover into the bottom and rear of the case.

10. Proceed with the section titled, 'Attaching RAMLink to you Computer' found in Section 2 (page 2-9) of the RAMLink manual. Make sure that you also perform the steps given in the part of that section titled, 'RAMLink Clip Connector Installation Procedure'.
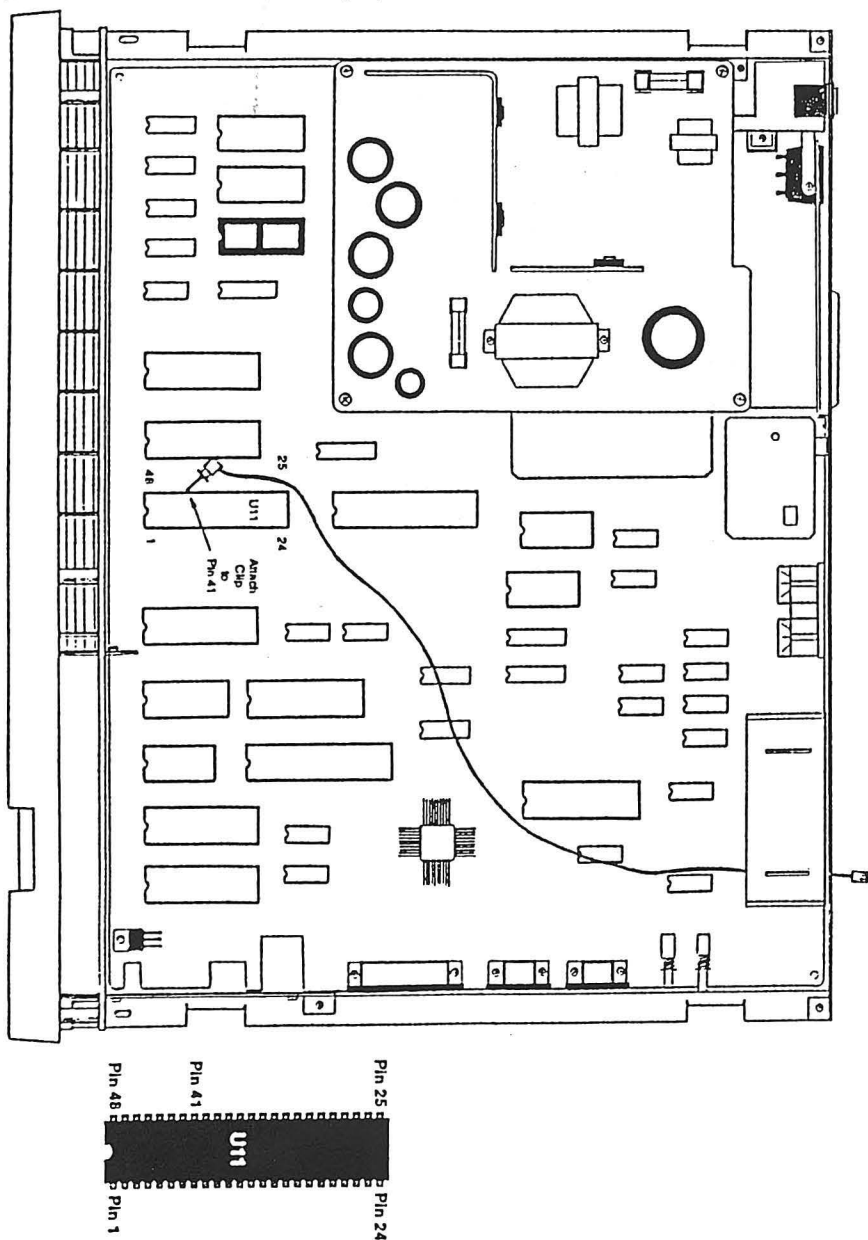
Figure 2

Upgrade Installation Procedures

RL-DOS Installation

Please follow the instructions given here closely whenever installing a new RL-DOS ROM chip. If you do not wish to perform this installation yourself, contact CMD. We will perform the installation for a $25.00 charge to cover installation and return shipping.

WARNING: Be sure to ground yourself or discharge any static electricity by touching a grounded surface before beginning this procedure. Failure to take the proper steps to eliminate static could result in damage to your RAMLink or any other static sensitive devices you come in contact with.

Installation Procedure

1. Make sure your computer is turned off and remove all power from RAMLink (including the battery if you have one). You should also remove any cartridges or RAM expanders which are plugged into the ports on top, as well as the parallel cable for the HD if you have one attached.

2. Remove RAMLink from your computer.

3. Disassemble RAMLink by removing the top half of the case. To do this, you must remove four Allen screws located on the sides of the case (two per side). This will require a 5/64" Allen wrench. Once the screws have been removed, gently separate the two halves of the case (be careful - there is a short ribbon cable inside which connects the LED/SWITCH circuit board to the main board.

4. Using a small flat blade screwdriver or an IC extractor, remove the ribbon cable header from the socket labelled P4 on the main circuit board (see Figure 3 for location). You may now set the top half of the case aside.

5. If you have a RAMCard in your RAMLink, you will have to disconnect it from the main board. RAMCard is connected at two different points on the main board. One is an electrical connection (P1 on RAMCard, P5 on the main board), and the other is plastic mounting standoff. Remove RAMCard from the electrical connection (P1/P5) by placing your fingers under each side of the RAMCard board and rocking it gently upward. You may leave RAMCard attached to the plastic standoff, using it as a pivot. Rotate RAMCard on this pivot point counter-clockwise until it is in the position shown in Figure 4.
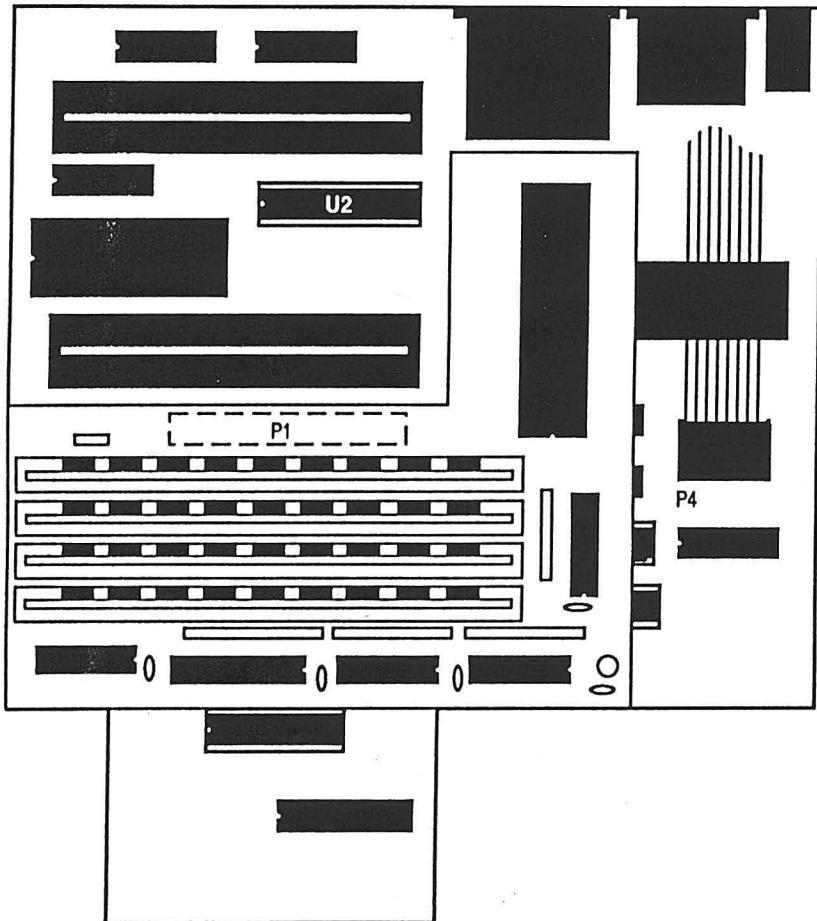
Figure 3

6. Locate and remove the existing RL DOS ROM (RL-701003) identified as U5 on the main board. You may use either a chip extracter or a small flat blade screwdriver. You should attempt to remove the chip evenly from the socket by lifting one end slightly, then the other end, back and forth until both ends are out of the socket. Do not attempt to remove the socket from the circuit board - make sure your extractor or screwdriver blade is between the chip and the socket!

7. Place the new ROM IC included with your upgrade into the socket (notched end of the chip pointing toward the left side of the main board - see Figure 4). Also note that this chip has less pins than does the socket, and that it should be placed all the way to the right side of the socket, leaving four holes in the socket unused (two on each side).

Before pressing the new chip firmly into the socket, make sure that all pins are aligned properly to avoid damaging the chip during insertion.

8. If you have a RAMCard, return it to its original orientation. Carfully line up the electrical connector P1 on the RAMCard with the mating connector P5 on the main board. When these are properly aligned, press the connectors back together. Be sure to check the alignment of this connection again to make sure that the RAMCard is properly attached. WARNING: Serious electrical damage can occur if these connectors are not properly mated.

9. Connect the ribbon cable header from the top half of the case to the dip socket connector labelled P4 on the main board. The ribbon cable should emerge from this connector toward the rear panel of RAMLink. Make sure that all pins are properly aligned with the mating socket before pressing the header into place.
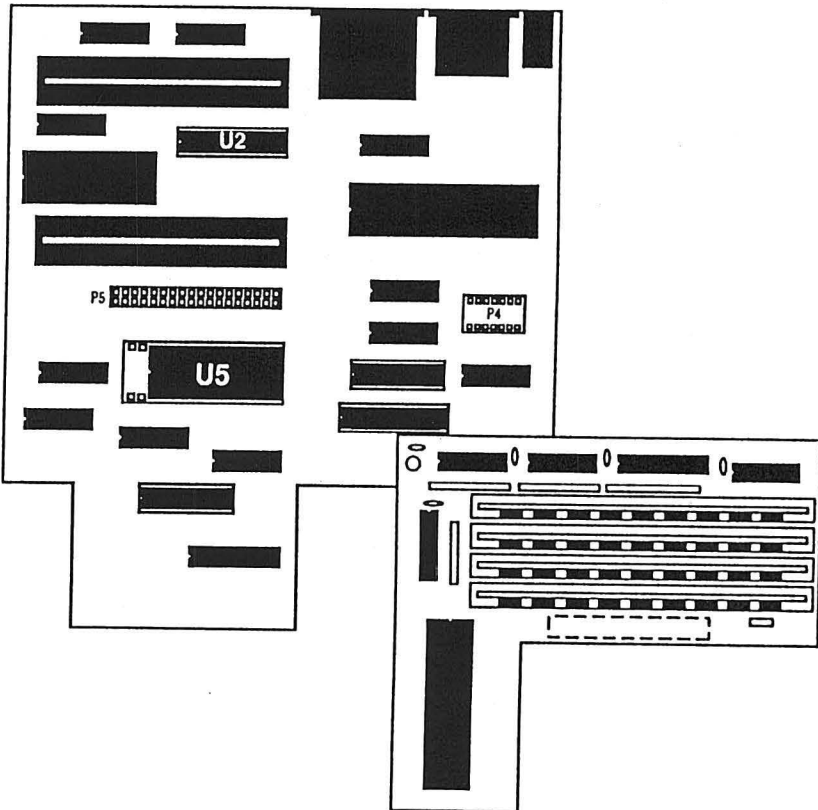

Figure 4

10. Slide the top half of the case back onto the bottom half, and replace the four screws which hold the case together. Follow the instructions in the manual for setting up RAMLink. It is wise to make sure that RAMLink is operating before plugging any cartridges or the backup battery into the unit. If you have problems, open RAMLink and check all connections. If your RAMLink still does not operate, contact CMD for additional help.

RAMCard II RTC Option Installation

If you have a RAMLink version 2 (serial numbers RL 001700 and higher) which contains RAMCard II without the RTC option, you may add the RTC option by ordering a RAMCard II RTC Kit from CMD. This kit contains the following items:

- RTC chip (RAMCard IC U6 or CMD part number HD-201010)
- GAL (RAMCard IC U1 or CMD part number RL-701606)

WARNING: Be sure to ground yourself or discharge any static electricity by touching a grounded surface before beginning this procedure. Failure to take the proper steps to eliminate static could result in damage to your RAMLink or any other static sensitive devices you come in contact with.

Installation Procedure

1. Make sure your computer is turned off and remove all power from RAMLink (including the battery if you have one). You should also remove any cartridges or RAM expanders which are plugged into the ports on top, as well as the parallel cable for the HD if you have one attached.

2. Remove RAMLink from your computer.

3. Disassemble RAMLink by removing the top half of the case. To do this, you must remove four Allen screws located on the sides of the case (two per side). This will require a 5/64" Allen wrench. Once the screws have been removed, gently separate the two halves of the case (be careful - there is a short ribbon cable inside which connects the LED/SWITCH circuit board to the main board.

4. Using a small flat blade screwdriver or an IC extractor, remove the ribbon cable header from the socket labelled P4 on the main circuit board (see Figure 3 for location). You may now set the top half of the case aside.
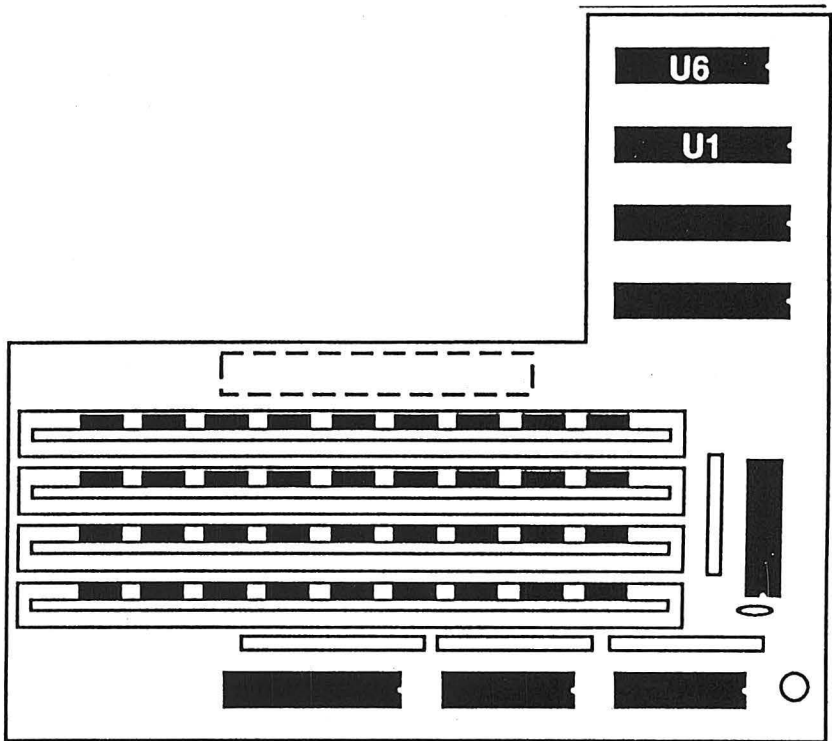
Figure 5

5. Locate the IC chip U1 on RAMCard (see Figure 5). The chip currently in that socket is usually marked as RL-701605. Using a small flat blade screwdriver or IC extractor, remove this chip and replace it with the GAL IC included with your kit (CMD part number RL-701606). Make sure that the chip orientation is correct before installing (notch to the right as shown in Figure 5).

6. Locate the socket for U6 on RAMCard (see Figure 5). Install the RTC chip (CMD part number HD-201010) into that socket, making sure that the orientation is correct (notch to the right as shown in Figure 5).

7. Before you re-assemble your RAMLink, make sure that the RAMCard is fully seated.

8. Connect the ribbon cable header from the top half of the case to the dip socket connector labelled P4 on the main board. The ribbon cable should emerge from this connector toward the rear panel of RAMLink. Make sure that all pins are properly aligned with the mating socket before pressing the header into place.

10. Slide the top half of the case back onto the bottom half, and replace the four screws which hold the case together. Follow the instructions in the manual for setting up RAMLink. It is wise to make sure that RAMLink is operating before plugging any cartridges or the backup battery into the unit. If you have problems, open RAMLink and check all connections. If your RAMLink still does not operate, contact CMD for additional help.

11. Use the program SET RL CLOCK from the RL Utilities disk to set the clock on RAMLink.

Upgrading Older RAMLinks with an RTC

If you have a RAMLink version 1 or a version 2 with a serial number of RL 001699 or lower, you may add the RTC option by ordering a RAMCard II Upgrade Kit from CMD. This kit contains the following items:

- RAMCard II
- GAL (RAMLink IC U2 or CMD part number RL-701037D)
- RLDOS ROM v2.00 (or higher)
- RL Utilities disk

WARNING: Be sure to ground yourself or discharge any static electricity by touching a grounded surface before beginning this procedure. Failure to take the proper steps to eliminate static could result in damage to your RAMLink or any other static sensitive devices you come in contact with.

Installation Procedure

1. Follow the instructions given earlier in 'RL-DOS Upgrade Installation', steps 1 through 7, to install the new RL DOS chip.

2. Locate RAMLink IC U2, which is between the RAM Port and Pass-Thru Port connectors on the RAMLink main board. Using a small flat blade screwdriver or IC extractor, remove the chip currently in that socket and replace it with the GAL IC included in the kit (CMD part number RL-701037D). Make sure that the chip orientation is correct before installing it (notch to the left as shown in Figures 3 and 4 of this addendum).

3. Now follow steps 6 through 9 in Appendix E of the RAMLink manual to complete installation of your new RAMCard (if you already have an old RAMCard installed, remove it first).

4. Use the program SET RL CLOCK from the RL Utilities disk to set the clock on RAMLink.

RAMCard II RTC Commands and Utilities

Time and Date Stamped Directory Listings

If your RAMLink is equipped with an RTC option, RL-DOS will place each file's time and date of creation into the directory entry. This is done for all file types, regardless of the partition type in which it is created. RAMLink uses the same method as GEOS for time and date stamping file entries. In order to allow the user to easily view the time and date stamp, new options have been added for loading directories. These options allow the stamp to be viewed, and also permit the user to select files which were created within a specified timeframe. The syntax for the time and date stamped directory is:

LOAD"$=T[n] [path] [:pattern[=(tp|option) [,option]]],dv

where: n   = partition number of the directory to be loaded
         path   = the subdirectory you wish to view
         pattern   = name of file or pattern to match
         tp   = first character of filetype (P, S, R, U or B)
         option   = one of the options listed below
         dv   = current device number assigned to RAMLink

options: L   = long format
          N   = do not include time and date in listing
          >stamp   = greater than or equal to *stamp*
          <stamp   = less than or equal to *stamp*

stamp format: MM/DD/YY HH:MM xM

Alhough the syntax for this command may look a little complex, it is really quite simple to use when broken down into separate elements.

The partition number (*n*) may be specified if desired. If this parameter is omitted, the current partition will be targeted for this command.

The *filename* is the name of a file or a standard pattern matching string. You may use the asterisk (*) to match a number of characters, and question marks (?) to match individual characters. See 'Pattern Matching' in the subsection 'Viewing Directories' in the RAMLink manual for examples.

The file type (*tp*) is optional, but if specified it must be the first option after the filename pattern. This may be a P (PRG), S (SEQ), R (REL), or U (USR). If you wish to view all file types, skip this option. This too is covered in the examples under the 'Pattern Matching' heading.

The *options* allow you to match specific times and dates (*>stamp*,*<stamp*), and also to specify long format (L). You may also specify that the directory entries match a certain time and date stamp, but that the directory list is not to include these times and dates (N). You may use as many of these options as you wish, but they must be separated by commas (,).

The 'long' time format gives the full date and time:

```
112  "TESTFILE"           PRG    02/02/90    04.44 PM
```

The 'short' (default) time format gives the date and time as follows:

```
112  "TESTFILE"          P 02/02 04.44 P
```

If the no-list (N) option is given, the directory entries will be loaded as they normally appear whether the long format (L) is specified or not. This means that specifying the long format and the no-list option in the same command is usually a waste of time. The reason that the no-list option was created was to allow you to use the time and date of files as pattern matching criteria within programs which cannot accept the extra time and date characters.

The *<stamp* option will list all files which have a creation time and date less than or equal to the time and date specified in *stamp*. The *>stamp* option will list all files which have a creation time and date greater than or equal to the time and date specified in *stamp*.

If both the *<stamp* and *>stamp* options are used within the same command, the resulting list of files will include files which fall between the range of the two time and date stamps specified.

The *stamp* format must be entered exactly as shown. This means you must specify the month, day, and year with two characters each and separate them with a slash (/). The hour and minute must also be given with two characters each in 12 hour format separated with a colon (:) or a period (.). The last parameter must be AM or PM. The date and time must be separated by a single space, and so must the time and AM/PM parameters. Here are a few examples:

```
LOAD"$=T",12
LOAD"$=T2",12
LOAD"$=T2:*=P",12
LOAD"$=T2:*=P,L",12
LOAD"$=T2:*=P,L,>12/21/89 04:15 PM",12
LOAD"$=T:*=L,<12/21/89 04:15 PM",12
LOAD"$=T4:*=S,N,>12/01/89 12:01 AM,<12/31/89
12:00 PM",12
```

JiffyDOS Examples:

```
@"$=T",12
@"$=T2"
@$=T2:*=P
@$=T4:*=S,N,>12/01/89 12:01 AM,<12/31/89 12:00 PM
```

RTC Commands

There are three types of commands provided for reading and setting RAMLink's internal real-time clock. Each type of command uses a different format for sending and receiving clock data. The data types used are ASCII, BCD (binary coded decimal), and decimal.

Reading Time and Date in ASCII Format

The 'T-RA' command allows you to read RAMLink's clock and return the date and time as an ASCII string over the error channel. The syntax for this command is as follows:

```
OPENlf,dv,15:PRINT#lf,"T-RA"
```

where: lf   = the logical file number
        dv   = the device number of RAMLink

After the 'T-RA' command is sent, the RAMLik error channel will return the date and time in the following format:

```
"dow. mo/da/yr hr:mi:se xM"+CHR$(13)
```

where: dow. = the day of the week (4 characters followed by a space).
                    SUN.
                    MON.
                    TUES
                    WED.
                    THUR
                    FRI.
                    SAT.
        mo   = the month (01-12)
        da   = the day
        yr   = the year
        hr   = the hour (01-12)
        mi   = the minute (00-59)
        se   = the second (00-59)
        x   = A or P (denoting AM or PM)

To read the error channel from BASIC, the following GET loop can be used:

```
10 GET#lf,A$:T$=T$+A$:IF ST<>64 THEN 10
```

Writing Time and Date in ASCII Format

The 'T-WA' command allows you to set the HD's internal real-time clock by sending an ASCII string representing the current time over the command channel. The syntax for this command is as follows:

```
OPENlf,dv,15
PRINT#lf,"T-WAdow. mo/da/yr hr:mi:se xM"
CLOSElf
```

where: If   = the logical file number
dv   = the device number of RAMLink

The remaining parameters (*dow., mo, da,* etc.) follow the same format as described above under the 'T-RA' command. Note: it is very important that the time and date parameters are separated by the same number of spaces and delimiters as shown above. Also, the day of week *must* be four characters long and followed by a space (see 'T-RA' for valid day-of-week strings). If these parameters are not provided in the correct manner, RAMLink will not set the time correctly.

Reading Time and Date in Decimal Format

The T-RD command allows you to read RAMLink's clock and return the date and time as a series of decimal-valued bytes over the error channel. This command provides BASIC (or ML) programmers with a means to read the current time and date in numeric format from within a program. The syntax for the 'T-RD' command is as follows:

```
OPENlf,dv,15:PRINT#lf,"T-RD"
```

where: If   = the logical file number
dv   = the device number of RAMLink

After the 'T-RD' command is sent, the RAMLink error channel will return the date and time as bytes in the following format:

Byte 0   - day of week (00=SUN., 01=MON., etc.)
Byte 1   - year (i.e 1990=90)
Byte 2   - month (01-12)
Byte 3   - day (01-xx)
Byte 4   - hour (01-12)
Byte 5   - minute (00-59)
Byte 6   - second (00-59)
Byte 7   - AM/PM flag (00=AM, non-0=PM)
Byte 8   - CHR$(13)

Writing Time and Date in Decimal Format

The 'T-WD' command allows you to set RAMLink's internal real-time clock by sending a series of decimal-valued bytes representing the current time over the command channel. The syntax for this command is as follows:

```
OPENlf,dv,15
PRINT#lf,"T-WD"+CHR$(byte0)+CHR$(byte1)+
CHR$(byte2)+CHR$(byte3)+CHR$(byte4)+CHR$(byte5)+
CHR$(byte6)+CHR$(byte7):CLOSElf
```

where: lf   = the logical file number
       dv   = the device number of tRAMLink
      bytes 0-7 = The current time and date represented by eight decimal bytes (format given under the 'T-RD' command).

Reading Time and Date in BCD Format

The 'T-RB' command allows you to read RAMLink's clock and return the date and time as a series of BCD bytes over the error channel. The syntax is:

```
OPENlf,dv,15:PRINT#lf,"T-RB"
```

where: lf   = the logical file number
      dv   = the device number of RAMLink

The error channel will return the date and time as BCD bytes in the following format:

Byte 0   - day of week (00=SUN., 01=MON., etc.)
Byte 1   - year (i.e 1990=$90)
Byte 2   - month ($01-$12)
Byte 3   - day ($01-xx)
Byte 4   - hour ($01-$12)
Byte 5   - minute ($00-$59)
Byte 6   - second ($00-$59)
Byte 7   - AM/PM flag (00=AM, non-0=PM)
Byte 8   - $0D

Writing Time and Date in BCD Format

The 'T-WB' command allows you to set RAMLink's internal real-time clock by sending a series of BCD bytes representing the current time over the command channel. This command is normally sent from within a machine-language program. The syntax for this command is as follows:

```
"T-WB"+BCD time
```

where: BCD time = The current time and date represented by eight BCD bytes. (format given under 'T-RB').

SET RL CLOCK Utility

This BASIC program located on the RL Utilities disk may be used to set the RTC time and date to the current time and date. You will have to use this program when you set up RAMLink for the first time and any time after that when power has been removed entirely from RAMLink. This program is mostly self-explanatory, and will prompt you for the required input.

RLTime Utility for GEOS

This utility is located on the back side of the RAMLink Utilities disk, along with the other GEOS utilities for use with RAMLink. It is an autoexec file (it executes during the start of GEOS), and will automatically set the GEOS clock from RAMLink's RTC. If you have the RTC option in your RAMLink, copy this file (using GEOS) to your GEOS boot disk or your GEOS boot partition on RAMLink (boot partitions can be created on RAMLink using geoMakeBoot or gateWay, both available separately from CMD).

Using GEOS with RAMLink

Getting Started

This documentation will take you step by step through the procedures for getting RAMLink or RAMDrive operating under all 2.0 versions of GEOS. This includes GEOS 128, and the GEOS supplied with Berkeley's GEORAM. Unless differences exist, all versions of GEOS will be referred to as GEOS.

What you'll need...

Required Software:

- Any 2.0 version of Berkeley Softworks' GEOS (boot disk)
- RAMLink or RAMDrive GEOS Utilities disk from CMD

Required Hardware:

- Commodore 64 or 128
- 1541 or 1571 disk drive
- CMD RAMLink or PPI RAMDrive with at least 512K of RAM
- Mouse or joystick

Optional Equipment:

- Additional drives, such as Commodore's 1581 3.5" disk drive or a CMD HD Series hard drive
- A GEOS supported printer (a list of supported printers can be found in your GEOS 2.0 manual

> **Important:** If you are using a RAMLink with less than 512K of RAM (1700 or 1764 REU only and no RAMCard memory), you cannot use the new CONFIGURE files supplied with RAMLink. Instead, switch RAMLink to DIRECT mode and use GEOS as you normally would.

About the Installation

Installation is not a complicated procedure. However, because you will be replacing files on your GEOS boot disk, we suggest you read this section over until you are comfortable with the procedures.

The installation consists of two basic parts; first it will be necessary to configure your RAM device for use with GEOS. After completing the hardware setup, you will need to install a new CONFIGURE file. The entire procedure should take you only a few minutes.

Hardware Setup

If you have not yet installed your RAM device into your computer and checked it for proper operation, do so now. After you are certain that your RAM device is working correctly with your computer, you may proceed with the following procedures.

1. With your RAMLink or RAMDrive attached, turn on your computer. Make sure that the RAM device is enabled, and if you are using a RAMLink you should also make sure that it is in NORMAL mode.

2. Insert the disk named RAMLink GEOS Utilities or RAMDrive GEOS Utilities into your disk drive. (This is normally located on the back side of the RAMLink Utilities or RAMDrive Utilities disk.)

3. Now type the following:

    LOAD"RL/RD GEOS SETUP",8

    Press the RETURN key when you have finished. (If your disk drive is not device number 8, then substitute the correct device number.)

4. After the program has loaded, you will see a READY. prompt appear on your screen. Now type:

    RUN

    After typing this, press the RETURN key to start the program.

5. As the program begins, a warning message will be displayed. Please be aware that this program will reconfigure the partitioning of your RAM device, and all data currently stored in the device will be lost. Press the 'Y' key on your computer if you wish to continue.

6. After a few seconds, the program menu will appear. Depending on how much RAM you have available, you will see from one to six options. The following is a brief description of these options:

    (1) 256K DACC (RAM 41 ONLY) - This option will allow your RAM device to emulate a 1764 REU under GEOS. This is the only option available to RAMDrive 512K owners. All leftover RAM will be placed into a CMD Native Mode partition which may be used for other (non-GEOS) purposes.

    (2) 512K DACC (RAM 71 ONLY) - This option allows your RAM device to emulate a 1750 REU under GEOS. This option is only available if your RAM device has at least 1 Megabyte of RAM. All leftover RAM will be placed into a CMD Native Mode partition which may be used for other (non-GEOS) purposes.

(3) 64K DACC + 1581 PART. - This option creates the minimum size direct access area required for GEOS, and also creates a 1581 Emulation partition. This partition may be used both from GEOS and from the native operating modes of your computer. Some GEOS applications (such as GEOWizard) will not work properly with this configuration, though most will. This option requires at least 1 Megabyte of RAM.

(4) 128K DACC + 1581 PART. - This option creates a larger direct access area to allow the use of programs which require an extra bank of RAM expansion memory (such as GEOWizard). It also creates a 1581 Emulation partition which may be used both with GEOS and from the native operating modes of your computer. This option requires at least 1 Megabyte of RAM.

(5) 256K DACC (RAM 41) + 1581 PART. - This option creates a direct access area large enough to emulate a 1764 REU under GEOS, and also creates a 1581 Emulation partition which may be used both with GEOS and from the native operating modes of your computer. Because this option gives you the ability to have two separate RAM 'disks' under GEOS, it has some advantages. However, since GEOS is limited to three devices at any time, it can also be confusing and awkward if you use more than one floppy drive. For those using a single floppy drive, this configuration is a good choice. This option requires more than 1 Megabyte of RAM, and will not work with applications which require an extra RAM bank (such as GEOWizard).

(6) 512K DACC (RAM 71) + 1581 PART. - This option creates a direct access area large enough to emulate a 1750 REU under GEOS, and also creates a 1581 Emulation partition which may be used both with GEOS and from the native operating modes of your computer. Because this option gives you the ability to have two separate RAM 'disks' under GEOS, it has some advantages. However, since GEOS is limited to three devices at any time, it can also be confusing and awkward if you use more than one floppy drive. For those using a single floppy drive, this configuration is a good choice. This option requires at least 1.5 Megabyte of RAM, and will work with applications which require an extra RAM bank (such as GEOWizard).

Select from the options available to you one which you feel suits your needs. Press the appropriate number key to select the option.

Please note that the RAM 41 and RAM 71 areas are unique to GEOS itself, and will not be accessible outside of GEOS. Also note that most of the options will leave you with some extra RAM, which can be used to create partitions for purposes other than GEOS. If you have

sufficient RAM, you can create additional 1581 Emulation partitions for use with GEOS by using RAM-TOOLS (each 1581 Emulation partition requires 3200 blocks or 800K of RAM). A special application (RAM_MOVE) has been provided to allow you to switch between partitions from the deskTop, and it may also be used to copy files from one partition to another.

After you have made your selection, the program will configure your RAM device according to that selection. During this configuration, the program will check to make sure that your RAM device has a device number which will not conflict with GEOS operation (it cannot be set for device numbers 8 through 11). It will also set the default partition number to partition number 1. After a few seconds, the program will end by performing a reset of the computer. Hardware setup is now complete unless you wish to create additional 1581 Emulation partitions for use with GEOS by using RAM-TOOLS (see the manual provided with your RAM device for details on using the RAM-TOOLS program). You may now proceed with the installation of a new CONFIGURE file.

Software Installation Procedures

Use the following steps to install the software required to use RAMLink or RAMDrive under GEOS:

1. First, with your RAM device connected and enabled (RAMLink users make sure that you are in NORMAL mode), power up your 64 or 128 and boot GEOS as you would normally.

2. Remove the GEOS System disk from Drive A and insert the RAMLink or RAMDrive GEOS Utilities disk. Click on the disk drive icon representing Drive A to open the disk.

3. From the menu bar, select *disk*. After the disk menu unfolds, click on *validate*. At this time, the DeskTop will validate the disk. If the DeskTop reports an error, proceed no further with the installation and contact CMD for a replacement disk.

4. Assuming the DeskTop reported no errors, remove the disk from Drive A, and re-insert your GEOS boot disk. Click on the Drive A icon to open the disk.

    At this point, it is necessary to remove the CONFIGURE file that came originally with GEOS and replace it with the appropriate version found on the RAMLink or RAMDrive GEOS Utilities disk. If you do not possess a backup of this file, back it up now! Please refer to your GEOS 2.0 manual for instructions on how to back up files.

5. Place the pointer over the CONFIGURE file icon and click once. At this point the icon will become highlighted. After a short pause, click again. A copy of the icon, called a 'ghost icon', will appear attached to the pointer.

6. Move the pointer to the bottom border area of the screen, between the waste basket and the printer icon. Click once. Now, the icon will disappear from the notepad, and reappear on the border.

7. Again, place the pointer over the CONFIGURE file icon and click once. As before, the icon will become highlighted; click again and move the ghost icon over to the waste basket.

8. With the CONFIGURE file icon positioned over the waste basket, click once. Your drive will whirr for a few moments, and the CONFIGURE file icon will disappear from the border. The name of the file now appears under the waste basket indicating that the file has been deleted.

9. Remove the GEOS System disk from Drive A and insert your RAMLink or RAMDrive GEOS Utilities disk. Open it by clicking on the disk icon.

   On the notepad you will find two replacement CONFIGURE files. The file you need is determined by the version of GEOS you use, either GEOS for the 64 (64 CONFIG RL) or GEOS 128 (128 CONFIG RL). From this point we will refer to these files simply as CONFIGURE.

10. Once you know which file is appropriate to your version of GEOS, place the pointer over the appropriate file's icon and click once. Click again and drag the ghosted icon to the border. Click to deposit the file icon on the border.

11. Remove the RAMLink or RAMDrive GEOS Utilities disk, and insert your boot disk. Click on the Drive A icon to open it.

12. Place the pointer over the CONFIGURE file icon (still located in the border) and click once. Drag the ghost icon to the notepad and click again.

13. The DeskTop will now request that you insert RAMLink or RAMDrive GEOS Utilities in Drive A. Do so, and click on *Okay*. After a few moments, you will be requested to insert your boot disk. You will have to swap disks a number of times before the copy operation is completed.

13. Once the procedure has been completed, the new CONFIGURE file will appear on your boot disk. Unless you wish to copy a new version of RBOOT to you boot disk (see below), you may now turn off your computer.

RBOOT

You will also notice that the RAMLink and RAMDrive GEOS Utilities disks contain the Commodore BASIC programs RBOOT and 128 RBOOT. These files take the place of the standard RBOOT files, and were written specifically for use with RAMLink and RAMDrive. If you wish to be able to reboot GEOS from RAM after exiting to BASIC, or even after your computer has been off, replace your current RBOOT with the appropriate version. You can use the same procedure given for replacing your CONFIGURE file by simply substituting the name of the file you wish to replace. For information on how to use RBOOT, see your GEOS manual.

Setting Up Your RAM Device Under GEOS

With your new CONFIGURE file copied to your boot disk, you are ready to begin using your RAMLink or RAMDrive under GEOS. Before you reboot, it is important to note the following limitations:

- Currently, only RAM 41, RAM 71 and 1581 Emulation Mode partitions are supported.
- CONFIGURE's 1581 DirShadow option is no longer supported by the 1581 driver.
- GEOS utilizes devices numbered 8, 9 or 10, and uses device number 11 temporarily for drive swapping. RAMLink and RAMDrive are not only RAM devices, but also act as 'serial bus' devices. Since GEOS does not know how to work with RAMLink or RAMDrive as serial devices, they should only be used with a device number of 12 or higher to avoid interfering with normal GEOS operation.
- GEOS expects devices to be consecutive. In other words, on a system with a single floppy drive attached as Drive A, your RAM disk should be configured as Drive B - *not* as Drive C.

With these limitations in mind, reboot GEOS with your RAM device attached and enabled (RAMLink users make sure that NORMAL mode is selected. It is not likely that when the DeskTop comes up the first time that you will see any additional drive icons associated with your RAM device. To accomplish this:

1. Double click on the CONFIGURE icon (64 CONFIG RL or 128 CONFIG RL). After a short pause, the CONFIGURE application screen will open showing three or four boxes labeled 'Drive A', 'Drive B', 'Drive C' and 'RAM expansion:'.

2. Find the first box (using A, B and C as the logical order) which does not have a drive selected. This will usually be Drive B on a system with a single floppy drive, or Drive C on a system with two floppy drives.

3. Select within that box the option you want to set according to the way you have configured your RAM device. Here is a list of likely settings according to the option selected in the RL/RD GEOS SETUP program:

    (1) 256K DACC (RAM 41 ONLY) - Select RAM 1541

    (2) 512K DACC (RAM 71 ONLY) - Select RAM 1571

    (3) 64K DACC + 1581 PART. - Select RL/RD 1581 part.

    (4) 128K DACC + 1581 PART. - Select RL/RD 1581 part.

    (5) 256K DACC (RAM 41) + 1581 PART. - Select either RAM 1541 or RL/RD 1581 part. If you have two drive slots available, you may set one for RAM 1541 and the other for RL/RD 1581 part.

    (6) 512K DACC (RAM 71) + 1581 PART. - Select either RAM 1571 or RL/RD 1581 part. If you have two drive slots available, you may set one for RAM 1571 and the other for RL/RD 1581 part.

4. We suggest selecting the RAM Reboot option shown in the 'RAM expansion:' box. The RAM Reboot option is required if you want to be able to reboot your system from RAMLink or RAMDrive using the RBOOT program. Select the DMA for "MoveData" option only if you have a Commodore REU as part of your RAM expansion system.

5. Select *save configuration* from the *file* menu.

6. Your RAM device is now installed and ready for use under GEOS. Select *quit* from the *file* menu, and begin using your RAM device.

Using RAMLink or RAMDrive with GEOS

You will find using your RAM device under GEOS transparent. In fact, your RAM device will behave exactly as the type of drive it is emulating, with one notable exception - speed. Applications and data files will load at impressive speeds. Your RAM device also provides you with new capabilities, such as being able to retain programs and data in the RAM disk and the ability to reboot from RAM - even after your computer has been turned off!

With RAM MOVE, your RAM device offers you access to multiple 1581 partitions. Individual partitions can be dedicated to a single application and its support files. For example, one partition may alone be dedicated to geoPublish with associated applications and clip art. Another might contain a complete applications development environment with another containing word processing or graphics. And with RAM_MOVE, you may also copy files easily between partitions. For that reason alone, a copy of RAM_MOVE and the DeskTop should be kept in each partition that you use under GEOS.

Using RAM_MOVE

RAM_MOVE is the pivot of the RAM environment for those with enough RAM to use multiple 1581 partitions. In addition to allowing easy access to other 1581 partitions, RAM_MOVE enables multiple file coping between partitions.

Starting RAM_MOVE is as simple as double clicking on its icon. After a moment the application screen will open and display a list of partitions available. (Note: RAM_MOVE will only display 1581 partitions)

Partition Switching

After the application has been started, you can easily move to another partition by simply clicking on the name of the partition in the list, and then clicking once on the *Open* button. To return to the deskTop, click once on the *Quit* button.

Copying Files Between Partitions

To copy a file or multiple files from one partition to another, use the same procedure given above in 'Partition Switching' to select the source partition. After clicking on the *Open* button, the partition list will be replaced by a list of files contained within the source partition. You will also see a number of option icons appear near the bottom of the requestor box. These options are (from left to right): De-select All, Select All, Move to Bottom of List, Move to Top of List, Scroll Down one Page, Scroll Up One Page, Scroll Up one File, Scroll Down one File.

You may select any single file by clicking once on its name. Selected files are shown in reverse print. You may de-select a selected file by clicking on its name once again. You may also select or de-select a group of files by dragging the pointer over the filenames while the button is depressed.

After you have selected all the files you wish to copy from the source partition, click once on the *Open* button. The file list will be replaced by the list of available partitions. Select from this list the target or destination partition, and click the *Open* button. The files will be copied, and when done, the program will end automatically.