

RANGERDISK2

PC COMPATIBLE DISK DRIVE FOR THE
CAMBRIDGE Z88

USER GUIDE

CONTENTS

- 1. INTRODUCTION
- 2 FILE TRANSFER
- 3 INSTALLATION
- 4 OPERATOR INFORMATION
 - 4.1 General
 - 4.2 Operation
 - 4.3 AC Operation
 - 4.4 RANGERDISK 2 Functions
 - 4.4.1 Catalogue Z88
 - 4.4.2 Select Z88 Device
 - 4.4.3 Select Z88 Directory
 - 4.4.4 View Z88 File
 - 4.4.5 Save to Disk
 - 4.4.6 Catalogue Disk
 - 4.4.7 Select Disk Directory
 - 4.4.8 View Disk File
 - 4.4.9 Load from Disk
 - 4.4.10 Erase Disk File
 - 4.4.11 Rename Disk file
 - 4.4.12 Create Disk Directory
 - 4.4.13 Erase Disk Directory
 - 4.4.14 Change Disk
 - 4.4.15 Format Disk
 - 4.4.16 DISKFILER 2 Options
 - 4.5 Marking Files
- 5 ALTERNATIVE APPLICATIONS
- 6 RANGERDISK 2 SPECIFICATIONS

RongerDisk 2 User Guide

1. Introduction

RANGERDISK 2 is a compact, 3.5" IBM-compatible floppy disk drive for the Cambridge Z88 Portable computer.

About the Cambridge Z88.

The Z88 computer is often used as an extension of desk-top PC systems, allowing users to take data into the field and to bring back reports, notes and correspondence written "on the move". When used in this way, Z88 offers by far the best combination of size, weight and capability for the needs of typical portable computer users, especially when compared with bulky and expensive "laptop" computers.

Using the 21b Z88, users can travel anywhere and edit or create files as they wish. With memory up to at least 1mb, Z88 can hold large numbers of files on its internal RAM disks and plug-in memory cartridges. Z88 also features a multiple-task operating system that can hold numbers of documents in a 'suspended' state, ready for immediate access at the point where the user left off.

The Pipedream word processor provides powerful editing facilities, together with the ability to add bold, underline and other character attributes to the document. An optional spelling checker with almost 60,000 English words is also available.

The Z88 is unique in offering powerful computer facilities and a full-size keyboard in a package that is small and light enough to carry anywhere. Because it is so easy to use, Z88 users tend to produce large volumes of data for transfer into PC's or for archive purposes. This data can be copied into Z88 EPROM's, transmitted directly to host PC's using Z88 Pclink or Maclink and can now be copied directly to PC compatible disks using RANGERDISK 2.

About RANGERDISK 2.

RANGERDISK 2 gives users the benefit of handling large volumes of data without requiring a dedicated PC to act as host to the 288. In fact, the combination of Z88 and RANGERDISK 2 can be regarded as a highly flexible alternative to the PC itself in many applications. Of course, RANGERDISK 2's 3.5" diskettes can be written to and read from in all PC and PC-compatible computers using 3.5" drives, making data transfer to and from these systems simplicity itself.

The Z88 RANGERDISK 2 package.

The Z88 RANGERDISK 2 package consists of the RANGERDISK 2 Disk Drive, an AC adapter, an application EPROM cartridge for the Z88 containing the DISKFILER 2 utility, a connecting cable and this manual.

RANGERDISK 2 requires no modification to the Z88, connecting to the serial data port through a connecting cable (supplied). A utility program, DISKFILER 2, allows the user to select files for transfer between disk drive and Z88, either singly or in batches. DISKFILER 2 provides the user with an easy to use menu driven interface similar to the Z88's own Filer utility.

The application is driven from the Z88, which displays "windows" showing the current disk and Z88 directories, together with a command menu. Commands can be selected from either the menu or from "shorthand" functions, while a full list of all available functions is always available from the "MENU" key. DISKFILER 2 allows selection of device and directory on Z88, and the creation, renaming or deletion of files and directories on the disk.

The communication protocol used to communicate between the Z88 and RANGERDISK 2 continuously checks for the connection; so that it is not necessary to start the programs in any order. If the DISKFILER 2 program is interrupted, for instance in order to use a different application in the Z88, communication is automatically re-established when DISKFILER 2 is re-invoked. When file transfer is in progress, the Z88 screen shows a display of the file name currently being transferred, the file size, the progress of the transfer (in real time), and the number of files waiting in the queue. Filenames appear in the destination device window as they are transferred.

A useful feature of DISKFILER 2 is "View", which allows a quick look at the contents of any file on the Z88 screen.

2.0 FILE TRANSFER

DISKFILER 2 transfers one or several files from the RAM memory of the Z88 to the disk or from the disk to the RAM memory of the Z88. *In* order to make full use of all of the facilities provided by DISKFILER 2, it is necessary to understand the way that files, directories and disks are implemented in both the PC-compatible disk and the Z88.

2.1 The Filing System

The filing system on both the Z88 and disk can be thought of in much the same way as a filing cabinet. Typically, a filing cabinet would consist of a number of drawers, each one containing a number of folders. Each folder may contain several different letters. In order to extract a particular letter from the filing cabinet, the user has to specify which folder in which drawer contains the letter. On a Z88, the drawers are equivalent to the individual RAM cartridges, called devices. The folders are equivalent to directories and the letters are equivalent to files. Thus, to extract a particular file, the user must specify the device (drawer); the directory (folder) and the *filename* (letter). The devices are named as follows:

- :RAM.0 The internal memory of the Z88
- :RAM. 1 The RAM cartridge in slot 1 of the Z88
- :RAM.2 The RAM cartridge in slot 2 of the Z88
- :RAM.3 The RAM cartridge in slot 3 of the Z88

The directory names *are chosen by* the user and are made up of up to 12 characters on the 288, but only 8 on the disk.

Thus the full specification of the file "PART1.DOC" in the directory "MANUAL" held on the RAM cartridge in slot 1 would be:-

:RAM. 1/MANUAL/PART1.DOC

It would be inconvenient and time consuming if every time the user wished to specify a file, it was also necessary to specify the directory and the device. To overcome this requirement, both the Z88 Filer and DISKFILER 2 allow the user to select the device and the directory that he wishes to use in the Z88 and also the disk directory. These are called the Default Device and the Default Directories respectively.

If the user just specifies the filename, DISKFILER 2 will add the Default Device and the Default Directory automatically, thus giving a complete specification. If the user specifies the filename and the directory, DISKFILER 2 will just add the Default Device, again giving a complete specification.

The list of files contained in the Z88 on the Default Device in the Default Directory are always displayed by DISKFILER 2 in the middle of the three windows whenever DISKFILER 2 is running. Files in the disk default directory are displayed in the right-hand window.

Each application in the Z88 may have it's own, different, Default Device and Default Directory currently in force. It is therefore important to recognise where a file will be saved by one application if it going to be used by another application.

For example, suppose that the Default Device for Pipedream had been set to :RAM. 1 and a file had been saved from Pipedream to the Default Device i.e. just the filename had been entered. If the Default Device for DISKFILER 2 had been set to :RAM.0, the file just saved from Pipedream would not be shown in the window of DISKFILER 2. In addition, typing just the filename when specifying the file to DISKFILER 2 would cause a "file not found" error. In order to correctly specify the file from DISKFILER 2, it would be necessary to either type in the device as well as the filename (:RAM. 1/filename) or to change the DISKFILER 2 Default Device to RAM. 1.

2.2 File selection

File selection may be accomplished in several ways. If an operation is requested without a file having been 'marked', DISKFILER 2 will request that the filename be typed in. This is time-consuming and limits the scope of any operation to only one file. A more flexible method of selecting the files on which DISKFILER 2 must operate is to 'mark' them. DISKFILER 2 will perform the required operation on each filename in turn.

RangerDsk 2 User Guide

3. Installation

DISKFILER 2 can be installed in any Z88 with at least 128K of expansion RAM in slot 1. When invoked, the program uses a maximum of 24K of this memory. -

The DISKFILER 2 program resides on an EPROM which can be inserted into either slot 2 or slot 3 of the Z88. The EPROM may be left permanently in the Z88, or may be removed when not required to make space for additional applications. The following procedure must be followed whenever the DISKFILER 2 EPROM is removed from or inserted into the Z88.

DISKFILER 2 is a true Z88 application, not a Basic program, and is recognised by the Z88 operating system whenever the DISKFILER 2 cartridge is installed. However, it is essential to follow the standard Z88 procedure when installing the cartridge:

- 
- Press the INDEX key. The word INDEX will appear in at top left-hand side of the screen.
- Open the flap, carrying the numbers 1,2 and 3, at the front of the machine. The screen display will blank.
- Insert the DIMMER 2 cartridge in either slot 2 or 3. Ensure that the cartridge is inserted with the open slot innermost and with the serrated part of the moulding at the bottom.
- Close the flap. The screen display should re-appear.

DISKFILER 2 will now appear among the applications listed on the left hand side of the index screen.

Failure to follow this procedure can result in the operating system not properly recognising DISKFILER 2. Use of DISKFILER 2 (or any other Z88 application) when improperly installed in this fashion can lead to loss of data.

Once DISKFILER 2 is installed in your Z88, connect RANGERDISK 2 using the supplied cable, then connect the AC adapter supplied with RANGERDISK 2 to a suitable AC outlet and switch on. DISKFILER 2 may be invoked in one of two ways:

- Place the cursor over the DISKFILER 2 entry on the list of applications on the Index page and press the 'ENTER' key.

or:

- Press the **O** key followed by 'ZD'

On entering DISKFILER 2 the user is presented with a screen display split vertically into three sections, known as windows. This screen is the main command screen and is the state of the display when DISKFILER 2 is waiting for the user to request an operation. The left window shows a list of the possible operations that may be carried out. The centre window shows a list of the files currently held on the Z88 in its Default Device and Default Directory. The right window shows a list of files currently held on the disk in the currently selected directory. The cursor is positioned on the first possible operation in the left window. The possible operations are explained in detail below.

If the disk drive is not connected, or has no power the message 'Disk Drive not responding' will appear in the disk directory window.

The execution of an operation is initiated in two steps. Firstly, the file on which the operation is to be performed must be selected and secondly, the operation itself must be selected. The operation will then be performed by DISKFILER 2. During the operation, status information will be displayed to show the progress so far and the further actions to be performed. When the requested operation has been completed, DISKFILER 2 will return to it's main command screen.

To de-install DISKFILER 2, select 'Index' mode by pressing the `Index' key. Move the cursor onto the suspended activity named 'DISKFILER 2' in the suspended activities screen on the right hand side of the screen and type the sequence °KILL. The screen will blank and re-appear without the DISKFILER 2 activity.

While still in Index mode, open the flap and remove the cartridge. Failure to Kill DISKFILER 2 will result in the Z88 beeper sounding continuously after the cartridge is removed and the flap shut. If this occurs, simply re-install the cartridge and follow the 'Kill' procedure described above.

4. Operator Information

4.1. General

RANGERDISK 2 utilises a Z88 utility called 'DISKFILER 2'. DISKFILER 2 follows closely the operating principles of the Z88 Filer application, including syntax and wherever possible the same short cut codes. As a result, it is possible to become confused as to which is in operation: if in doubt, check the heading Itne to see whether Filer or DISKFILER 2 has been invoked 1

4.2 Operation

RANGERDISK 2 is a self contained unit requiring only a power source (AC adapter supplied, or optional battery pack), a connecting cable (supplied) and, of course, a Z88 to operate.

As a general precaution, avoid powering RANGERDISK 2 up or down while a disk is installed in the drive. While every care has been taken to ensure that data on disks installed in RANGERDISK 2 is safe, it is possible that disk corruption could occur during power up/down. Therefore, please be sure to eject the **disk** first.

4.8 AC Operation.

WARNING Use only the AC adapter supplied for RANGERDISK 2. NEVER use any other type of adapter. DO NOT attempt to connect the RANGERDISK 2 adapter to your Z88: serious damage may result. Adapters for use in overseas countries and in vehicles are also available: please contact Ranger Computers for details.

4.4 RANGERDISK 2 Functions

Function Name Shortcut

Catalogue Z88 <>CF	
Select Z88 Device <>SV	
Select Z88 Directory <>SI	
View Z88 File <>VZ	
Save To Disk <>	FS
Catalogue Disk <>	DD
Select Disk Directory <>	DI
View Disk File <>	VD
Load from Disk <>	FL
Erase File <>	ER
Rename File <>	RE

Create Disk Directory	
Erase Disk Directory	◁ED
Change Disk	"ESC"
Format Disk	FM
Options ◁	0

4.4.1. Catalogue Z88 | CF

Presents a catalogue of files in the currently selected Z88 device and directory. Catalogue does not respond selectively to marked files. '*' and '?' wildcards are supported.

4.4.2. Select Z88 Device | SV

Allows selection of Z88 device from .-, :RAM.0, :RAM.1, :RAM.2, or :RAM.3.

The user can step through Z88 Devices by typing ◁ J. For instance, if the -current device is :RAM.0, typing ◁J will step to :RAM. 1, and so on.

4.4.3. Select Z88 Directory | Code ◁SI

Allows selection of Z88 directory within the selected device. Directorles can also be selected with the cursor. Move the cursor onto the desired directory name in either Z88 or disk window and press `SHIFT' and 'Down Arrow'. The window will 'move down' into the directory.

To move back into a parent directory, position the cursor anywhere in either the Z88 or disk window and press 'SHIFT` and 'Up Arrow'. The window will move 'back up' to the parent directory. If no files are present in the child directory, the name "PARENT DIRECTORY" will appear in the window so that this function can be performed.

4.4.4. View Z88 File | Code ◁VZ

In order to enable the user to ensure that the correct file is transferred onto the disk, this operation allows the contents of any file on the Z88 to be displayed on the Z88 screen. If necessary, the whole file may be viewed eight lines at a time. Pressing the 'ESC' key at any point will terminate the operation.

The file is not loaded into the Z88 during this process.

4.4.5. Save to Disk

Code <>FS

Saves marked File or Files to disk under the same name. If no file is marked, prompts for file name of source file and destination file. Note that DISKFILER 2 will default to the selected device and directory if none is specified. Directory or sub-directory names may not be included in the destination name: they will result in a 'Bad Filename' message.

If the filename does not already exist on the disk, it will be created. If it does exist, it will be overwritten.

Because the Z88 allows filenames containing up to 12 characters (excluding the extension), a potential incompatibility exists when files are copied to DOS format disks. If the source filename is longer than the DOS format standard of 8 characters, it will be truncated to 8 characters when created on the disk. For example, AMCALLREP.PRG becomes AMCALLRE.PRG.

The Save to Disk operation may be interrupted by pressing the 'ESC' key. If the disk file is still being written, the result of this action will be to create a zero-length file on the disk.

4.4.6. Catalogue Disk

Code DD

Presents a catalogue of files on the currently logged disk. Catalogue does not respond selectively to marked files. '*' and '?' wildcards are supported.

4.4.7. Select Disk Directory

Code <>DI

Allows selection of disk directory. Directories can also be selected with the cursor. Move the cursor onto the desired directory name in either Z88 or disk window and press 'SHIFT' and 'Down Arrow'. The window will 'move down' into the directory.

To move back into a parent directory, position the cursor anywhere in either the Z88 or disk window and press 'SHIFT' and 'Up Arrow'. The window will move 'back up' to the parent directory. If no files are present in the child directory, the name "PARENT DIRECTORY" will appear in the window so that this *function* can be performed.

4.4.8. View Disk File

Code <>VD

In order to enable the user to ensure that the correct file is transferred into the Z88, this operation allows the contents of any file on the disk to be displayed on the Z88 screen. If necessary, the whole file may be viewed eight lines at a time. Pressing the 'ESC' key at any point will terminate the operation.

The file is not loaded into the Z88 during this process.

4.4.9. Load from disk

Code <>FL

Fetches a marked file or files into a file of the same name in the Z88 device and directory selected. If no file is marked, prompts for *source and destination* filenames. Directory names may be included in the destination name, otherwise the selected device and directory name will be used.

If the filename already exists in the Z88, it will be overwritten. If it does not exist, it will be created.

Fetch *from* disk may be interrupted by pressing the 'ESC' key. If the Z88 file is still being written, the result of this action will be to close the file at the point that has been reached.

Note: On the disk, filenames can contain the characters and 1. these characters are not permitted on the Z88 and are changed to '-' when files are copied *from* disk to Z88. In addition, disk filenames can only contain upper case alpha characters, unlike the Z88 which allows both upper and lower case. This difference can provide a useful indication as to the source of files in the Z88: If a file with lower case characters in the name is copied to the disk and then back to the Z88, the lower case characters will be converted to upper case.

4.4.10. Erase File

Code <>ER

Erases marked file or files on the disk. If no file is marked, prompts for filename.

4.4.11. Rename File

Code <>RE

Renames the disk file.

4.4.12. Create Disk Directory

Code <>CD

Allows creation of a disk directory. Once created, the directory name will appear in the disk window in 'small print', to differentiate it from a filename.

One reason to create sub-directories is to allow more files to be stored. In order to be compatible with DOS, RANGERDISK 2 limits the number of files, including sub-directory names, to 112 in the root directory. However, each sub-directory can hold numbers of files limited *only* by disk space. In order to limit use of Z88 RAM space, DISKFILER 2 displays only the first 254 filenames in any *directory*.

4.4.13. Erase Disk Directory Code <>ED

Allows removal of a disk directory. The disk directory must be empty before removal is actioned.

4.4.14. Change Disk "ESC"

This function must be carried out each time the disk in the RANGERDISK 2 drive is changed. It results in the disk directory being read into the Z88 by DISKFILER 2 and displayed in the disk directory screen area. This function is performed automatically after completion of most DISKFILER 2 commands.

4.4.15. Format Disk Code <>FM

Formats the disk in the RANGERDISK 2 drive to a format compatible with MS-DOS 3.3. **WARNING** Use of this command erases all data on the disk in the drive.

Format asks: "Do you wish to continue?". Type "Y" (yes) to continue with the format; otherwise select 'No' simply by pressing Enter to return to DISKFILER 2.

4.4.16 Options Code <>O

This command allows you to select the format density for RANGERDISK 2 and also file conversion options.

Format density is either 1.44M (HD Disk) or 720k (DD Disk) - move the bar cursor with the cursor keys to highlight the format density required. Please note that RANGERDISK 2 will not format a DD disk to 1.44M.

The conversion options allow the file format to be modified on saving to allow easy importation of the file into either WordPerfect, WordStar, or any word processor expecting plain ASCII text. Please note that the file is only modified to the degree that the linefeeds and carriage returns are correct for each package - no attempt is made to convert highlights such as underlining or bold text etc.

In order to use the conversion options, you should prepare your file on the Z88 using column A only, save the file as Plain Text in the Z88 Filer, and then **save** the file to RANGERDISK 2 using the relevant conversion option. Please note that conversion **only** works when saving, i.e. It is a one way process.

As with the format option, if you require conversion you should select it by highlighting the required option with the bar cursor.

When any of the three file conversion options are set, DISKFILER 2 puts a warning triangle symbol in the OZ area on the right hand side of the display. This is to bring to your attention any file conversion option which may have been set accidentally.

NB: You should normally leave the conversion options set to "NONE", the default setting. Files saved with conversion set will not reload into PipeDream on the Z88, so be sure to keep a standard copy of the file on disk too.

4.5 Marking Files

Many RANGERDISK 2 Functions can use marked files, either individually or in batches. Files may be marked in both Z88 and disk- windows. Note: Directory names cannot be marked. The following commands can be used to mark files:

4.5.1 ENTER. Place the cursor bar on the desired file name using the cursor keys. Press 'ENTER'. A chevron symbol appears, denoting that the file is marked.

Only one file at a time can be marked with 'ENTER': If the key is pressed again, the file is unmarked.

Note: If 'ENTER' is pressed while marked files appear in a window, all files in that window will be unmarked.

4.5.2 TAB. Place the cursor bar on the desired file name and press 'TAB'. A chevron symbol appears, denoting that the file is marked.

Any number of files can be marked with 'TAB'. However, if the cursor bar is placed on a marked file and 'TAB' is then pressed, the file is unmarked:

4.5.3 <>ENTER. Place the cursor bar anywhere in the relevant window and press '<>', followed by 'ENTER'. All files in the window will be marked.

Individual files can be unmarked by 'TAB'

5.0 Alternative Applications

5.1 Use with IBM-PC and compatibles

RANGERDISK 2 can be used as an extension drive for IBM-PC and compatible computers. A driver software package and connecting cable, available from the Club, allows RANGERDISK 2 to be configured as an external drive on the PC, connecting through the host computers' serial port.

5.2 Special applications

An applications programming manual for RANGERDISK 2 is available from Ranger Computers. The manual describes the communication protocol used by the disk drive and contains sufficient information to allow the programmer to carry out disk operations on any computer that has an RS-232 port and can support the correct communications format.

The manual also contains sample listings written in BASIC for each disk function.

RANGERDISK 2 is also suitable for use with a wide range of other portable computers, hand-held terminals and data collection devices. Please contact Ranger Computers for details.

6. Specifications

6.1 Basic Specifications

Disk Format:	MS-DOS3.3 Compatible	
Media Capacity:	1.44M Bytes formatted	
Type:	3.5" IBM PS/2 compatible hard jacket floppy disk	
M.T.B.F. :	Approx. 10,000 Hours	
M.T.T.R. :	20 Minutes	
Mechanism life:	5 Years	
Dimensions:	180mm (L) x 117mm (W) x 45mm (H)	
Weight:	Approx. 0.8Kg	
Software:	DISKFILER 2 utility (supplied on plug-in EPROM cartridge) provides:	
	Catalogue Disk	Copy to Disk
	Catalogue Z88	Load from Disk
	Change Disk	Erase Disk file
	Select Z88 Device	Rename Disk Me
	Select Z88 Directory	Format Disk
	View Disk file	View Z88 File
	Select Disk Directory	Create Disk Directory
	Erase Disk Directory	Options

Files

IBM PC Compatible.

Maximum 112 files, including sub-directories, in Root directory. Unlimited files, disk space permitting , in each directory. First 254 filenames displayed in disk window:

Maximum 6 layers of sub-directory nesting.

6.2 Environmental specifications

Temperature

Operational +5 to 45 deg C.

Non-operational -20 to 50 deg C.

Temperature cycling': No condensation shall result

Humidity

Operational 20 to 80% relative humidity, non-condensing.

Non-operational: 1 to 95% relative humidity, non-condensing.

Altitude

Operational: Sea level to 15,000ft (4,500m)

Non-operational: Sea level to 40,000ft (12,000m)

Vibration

Operational: The unit shall withstand a peak acceleration of 2g for the frequency range of 20-100Hz.

Non-operational The unit shall withstand a peak acceleration of 4.5g for the frequency range of 20-100Hz.

Shock The equipment in a non-operational status shall not *suffer* damage or fail to operate according to specifications, when subjected to a 60g shock for IOmS.

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Warranty: RangerDisk 2 is covered by a comprehensive warranty, valid for 12 months from date of purchase. Please note that the warranty does not cover damage to the drive mechanism caused by dropping or rough handling. This does not affect your statutory rights.